MAKERERE UNIVERSITY

ANALYSIS OF HOUSEHOLD RESPONSES TO SHOCKS AND STRESSES DURING COVID-19 IN UGANDA

BY

PATRICIA NAMPIIMA

2023/HD02/4473U

A DISSERTATION SUBMITTED TO THE DIRECTORATE OF GRADUATE TRAINING IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE IN CLIMATE CHANGE AND DEVELOPMENT OF MAKERERE UNIVERSITY.

JANUARY 2026

DECLARATION

I, **Patricia Nampiima**, hereby declare to the best of my knwoledge that this is my oroginal work and that it has never been submitted before for any award in any university or any other institution of Higher Learning.

Signature……

Patricia Nampiima (Student)

2023/HD02/4473U

Date…07/01/2026……

APPROVAL

This dissertation is submitted to the Directorate of Research and Graduate Training with the approval of the undersigned university supervisors:

Signature..... Date..7/1/2026.....

Dr. Henry Musoke Semakula

Department of Geography, Geo-informatics and Climatic Sciences.

School of Forestry, Environmental and Geographical Sciences.

College of Agricultural and Environmental Sciences.

Signature..... Date..07.01.2026.....

Assoc. Prof. Revocatus Twinomuhangi

Department of Geography, Geo-informatics and Climatic Sciences.

School of Forestry, Environmental and Geographical Sciences.

College of Agricultural and Environmental Sciences.

DEDICATION

To my beloved parents whose strength, support and encouragement made my academic journey a successful one.

ACKNOWLEDGEMENT

I'm so grateful to the Almighty for the blessing of life, protection, knowledge, and perseverance during my study and research.

I wish to thank my university supervisors, Dr. Henry Semakula Musoke and Assoc. Prof. Revocatus Twinomuhangi for the endless academic guidance, insightful comments, and encouragement throughout my research journey. Dr Semakula has been an academic supervisor and a parent to me throughout my course and research, always providing adequate time for me to express myself. Whether I have questions or ideas, he has always been supportive. There is no way I would have been able to attain this achievement without his help; therefore, he is very much appreciated.

I wish to thank the Uganda High Frequency Phone Survey for providing me with secondary data that I used to run my research; the study would be inefficient without it.

I'm also very much indebted to my very good and long-time friend, Nakato Jovia, for the endless mentorship and guidance, as she was always available whenever I needed any form of assistance regarding the research study. This project wouldn't have been accomplished without you, you are highly appreciated.

I also thank my friend Nankinga Jovlet Sarah for being supportive and enabling me to express myself to her academically ever since we started this journey in 2023.

I thank the Department of Geography, Geo-informatics and Climatic Sciences for the conducive learning environment and support in enabling me to finish my research, as well as for providing us with this research opportunity, which has helped me acquire a number of research skills.

I extend my sincere heartfelt gratitude to my parents for the endless support, both financial and advisory, throughout my research study, together with my academic journey at large. May the almighty continue blessing.

Lastly, to all my friends and classmates in the cohort 2023, thank you for the encouragement and moral support

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

CATI	:	Computer Assisted Telephone Interviews
IGC	:	International Growth Centre
ILO	:	International Labour Organisation
ITCZ	:	Inter-Tropical Continental Zone.
NCCA	:	National Climate Change Act.
NDCs	:	Nationally Developed Contributions.
NDP	:	National Development Plan
NPA	:	National Planning Authority
SACCOS	:	Savings and Credit Cooperatives
UBOS	:	Uganda Bureau of Statistics
UHFPS	:	Uganda High Phone Frequency Survey
UNPS	:	Uganda National Panel Survey
USA	:	United States of America
VSLAs	:	Village Savings and Loans Associations.

ABSTRACT

The COVID-19 pandemic created an unprecedented health and socio-economic crisis that significantly weakened Uganda's health systems and disrupted household livelihoods. Whereas several studies documented the broader socio-economic effects of the pandemic, limited attention was given to the specific shocks households faced and how they responded. This study examined the types of shocks households in Uganda experienced during COVID-19, the factors influencing shock severity, and the coping strategies adopted. Using secondary data from the Uganda High-Frequency Phone Survey (2020–2022), the analysis covered 14,745 households. Descriptive statistics and logistic regression were employed at a 95% confidence level ($p < 0.05$). The most common shocks experienced included the death or disability of an adult working member, loss of a remittance provider, illness of an income-earning member, and job loss. Households experiencing income loss were 25% more likely to report severe shocks (OR = 1.25, $p < 0.01$), while those facing job loss had nearly double the odds of severe impact (OR = 1.87, $p < 0.001$). Exposure to drought (OR = 1.26, $p < 0.01$) and heavy rains or floods (OR = 1.19, $p < 0.05$) also significantly heightened vulnerability. Larger households (more than three members) had increased odds of severe shocks (OR = 1.09, $p < 0.001$). The most significant coping strategies included selling assets ($p = 0.045$), engaging in additional income-generating activities ($p = 0.003$), reducing food consumption ($p < 0.001$), and relying on savings ($p < 0.001$). These findings underscore the multifaceted shocks households endured during the pandemic and the lasting effects on their resilience. The study recommends establishing national unemployment insurance or emergency cash-assistance schemes particularly for informal workers and adopting job-protection measures such as wage subsidies and small-business support grants to strengthen household resilience during future crises.

Keywords: Shocks, Households, COVID-19, Vulnerability, Uganda

OPERATIONAL DEFINITION OF KEY TERMS

1. COVID-19 **:** A global infectious disease caused by the SARS-Cov-2 virus, Leading to respiratory illness, economic disruption and social challenges.
2. Households **:** Individuals or a group of people living together, sharing resources, responsibilities and decision-making within a single dwelling unit.
3. Shocks : Refers to sudden, unexpected events that disrupt social, economic or environmental systems. These may include; natural disasters, epidemics or economic crises.
4. Vulnerability : The risk of being harmed or affected by a shock or crisis due to limited ability to cope or adapt.

CHAPTER ONE

INTRODUCTION

1.1 Background to the study

The outbreak of COVID-19 marked the beginning of a global health emergency that resulted in approximately 6 million deaths by February 2022 and more than 630 million infections by November 2022 (Mwiinde et al., 2022). What initially appeared as a health crisis quickly evolved into a far-reaching social, economic, and human development challenge (Kanyike et al., 2021). Global economic output contracted by nearly USD 2 trillion, growth slowed to below 2.5%, and the world experienced one of the deepest recessions in recent history (Porsse et al., 2020). Lockdowns, travel restrictions, and social distancing measures imposed by governments halted economic activity, disrupted supply chains, and reduced access to essential services. These disruptions resulted in widespread unemployment, falling household incomes, and rising poverty, particularly in low and middle-income countries dominated by informal employment (Ahn & Norwood, 2021). The pandemic therefore, exposed deep structural weaknesses in economic systems, governance, and social protection mechanisms (Oran & Topol, 2020).

In many developing countries, COVID-19 coincided with long-standing socio-economic and environmental vulnerabilities. Before the pandemic, several nations were already grappling with economic stagnation, fragile health systems, food insecurity, and climate-related hazards such as droughts and floods. (Ezeh et al., 2021) observe, the pandemic intensified these pre-existing stressors, resulting in “compound crises”. Events such as Hurricane Hanna in the United States and Cyclone Amphan in Bangladesh displaced thousands and heightened infection risks (Botzen et al., 2022; Alam et al., 2023). These overlaps highlighted the interconnectedness between health emergencies and socio-environmental shocks, reinforcing the need for integrated risk-management approaches (Smith & Wesselbaum, 2020; Ongoma et al., 2024).

Globally, the combined impacts of COVID-19 and environmental shocks were severe. By August 2021, floods, droughts, and heat waves had affected over 139 million people and caused more than 17,000 deaths (Walton et al., 2021). Movement restrictions limited humanitarian response, while national budgets shifted from disaster preparedness to emergency health interventions (Walton & Van Aalst, 2020). Many households simultaneously faced health risks, income loss, and food insecurity, with marginalized groups, such as the poor, women, children,

and persons with disabilities, being disproportionately affected (Ford et al., 2022). These multidimensional crises stalled progress on several Sustainable Development Goals, illustrating COVID-19 as both a health crisis and a significant development setback.

In Africa, the socio-economic effects were particularly pronounced. Although infection and mortality rates were lower than initially projected, the continent faced widespread livelihood disruptions due to its reliance on informal and subsistence economic activities (Wright et al., 2024). Smallholder agriculture, Africa's largest employer, was severely affected by mobility restrictions, market closures, and supply chain interruptions (Bwire et al., 2022). These measures, though necessary to contain the virus, increased the risk of hunger and food insecurity (Jury, 2024). Food insecurity worsened as poverty levels in sub-Saharan Africa increased by more than 40%, reversing years of progress (Tabe-Ojong et al., 2023). Rural households struggled to access agricultural inputs and markets, while urban households faced rising food prices and shrinking incomes (Onyeaka et al., 2022). Many families relied on coping mechanisms such as reducing food consumption, selling assets, or depending on social support networks (Sawadogo & Ouoba, 2023b). The resulting malnutrition, especially among children and women had long-term implications for health and productivity (Naveen Thacker et al., 2020). Water scarcity also intensified as hand washing demands overwhelmed already inadequate water supply systems (Boretti, 2022). Flooding further reduced access to clean water and sanitation, increasing public health risks in flood-prone regions (Phillips et al., 2020). These interlinked challenges revealed gaps in resilience, equity, and policy coordination across the continent.

In Uganda, two major COVID-19 waves occurred between March-August 2020 and again from April 2021 to June 2021 (Elayeete et al., 2022). Containment measures, including curfews, market closures, and transport restrictions, severely constrained livelihoods, particularly in the informal sector that employs most Ugandans (Koos et al., 2020). Many households experienced income loss, depleted savings and reduced consumption. Food insecurity intensified as production and distribution systems were disrupted, while health facilities became overstretched. Vulnerable groups such as women, children, and the elderly faced increased caregiving burdens, heightened income shocks, and limited access to healthcare (Federica et al., 2020). Education was heavily affected by prolonged school closures, disrupting learning for millions of learners (Osabuohien et al., 2024). These impacts illustrated the high sensitivity of household welfare in Uganda to external shocks.

At the policy level, COVID-19 shifted national priorities toward emergency health and social protection responses, delaying progress on Uganda's revised Nationally Determined Contributions (NDCs) (Kaggwa et al., 2023). Nonetheless, the pandemic also spurred innovation and resilience-building, including investments in weather-resilient infrastructure, renewable energy, and digital service delivery (Sunderland, 2024). Despite these efforts, empirical evidence remains limited on how Ugandan households experienced and coped with multiple shocks during the pandemic. Many previous studies focus on macroeconomic impacts or specific regions, offering limited insight into national-level coping patterns.

In the context of food systems and household welfare, shocks are short-term deviations from long-term trends that have substantial negative effects on systems, people's wellbeing, assets, livelihoods, safety and ability to with stand future shocks (FAO, 2021). Studies by (Mahmud & Riley, 2023) indicate that the COVID-19 pandemic and the resulting Government lockdowns as well as market closures had significant economic costs for the poorest both rural and urban areas causing profound disruption to peoples livelihoods even in countries that experienced relatively few cases of COVID-19.

Existing research, though informative, remains fragmented. Onyeaka et al. (2022) highlight coping mechanisms such as using savings, selling livestock, and seeking remittances, but their work is region-specific and largely qualitative. (Mukoki, 2022) emphasizes household perceptions, while Sharma et al. (2021a) analyze coping strategies in western Uganda using high-frequency data. However, these studies either focus on limited geographical areas or do not comprehensively assess determinants of vulnerability and coping behavior at the national scale. They also fail to capture the climatic and non-climatic shocks and stresses which were experienced by households. International research (Crowley & Doran, 2020; Modegro et al., 2020), largely reflects developed economy contexts and offers limited relevance to countries characterized by informal employment and limited safety nets. A clear research gap therefore remains in understanding how Ugandan households navigated multiple economic, social, and health-related shocks during COVID-19.

This study addresses this gap by analyzing household responses to pandemic-related shocks that included both the climatic shocks for example; drought, Floods, irregular rains, crop failure as well as non-climatic shocks like death, illness, job loss, income reduction, increase in food prices, increase in non-food prices, loss of remittances, conflict (theft) and increase in price of agricultural inputs using nationally representative data from the World Bank's High-Frequency

Phone Survey (HFPS). The HFPS provides rich insights into household experiences, vulnerabilities, and adaptive behaviors throughout the pandemic period. By examining shock exposure, determinants of severity, and coping strategies, the study contributes to a deeper understanding of household resilience and vulnerability in times of crisis. The findings aim to inform post-pandemic recovery efforts, strengthen social protection systems, and support Uganda's preparedness for future health, economic or climate-related shocks.

1.2 Problem Statement

The COVID-19 pandemic added a significant layer of complexity to regions already struggling with multiple, overlapping risks across health, education, climate, and general well-being (Thalheimer, 2023). In Uganda, where households were already experiencing frequent and diverse environmental, climatic and socio-economic shocks (Twinomuhangi et al., 2023), the pandemic further slowed progress toward national development milestones, including those set under Uganda Vision 2040 (Ssewanyana, 2021). Although several studies have examined the interactions between COVID-19 and various shocks (Ezeh et al., 2021; Ongoma et al., 2024; Wright et al., 2024), much of the existing evidence is based on macro-level assessments conducted mainly in developed countries (Crowley & Doran, 2020; Ghosh & Cartone, 2020; Modrego et al., 2020). As a result, significantly less is known about the specific shocks households in developing countries like Uganda experienced and how they navigated them during the pandemic.

Studies conducted in Uganda to date, such as those by Sharma et al. (2021), (Amondo et al., 2025) have primarily relied on primary field-based datasets and focused heavily on household perceptions to assess the impacts arising from the various shocks. For example, (Amondo et al., 2025) concentrated mainly on combined effects of weather and health related shocks on consumption in rural Uganda, limiting the analysis to subjective experiences. Similarly, Sharma et al. (2021a) examined coping strategies adopted in response to rising shocks but restricted their study to western Uganda, despite using high-frequency phone survey data. Consequently, these studies provide only partial insights and do not offer a comprehensive national-level assessment of household vulnerabilities, the severity of climate related and non-climatic shocks, or the full range of coping mechanisms employed.

The knowledge gap, therefore, lies in the limited national-level evidence on the types of shocks households experienced during COVID-19 in Uganda, the household characteristics associated

with shock severity, and the coping strategies adopted across different urban and rural areas of all major regions (Central, Eastern, Western and Northern) and districts within them. Existing research remains fragmented, geographically narrow, or overly reliant on perceptions, without fully leveraging nationally representative datasets to understand the breadth and dynamics of household responses during the pandemic. Addressing this gap, the current study uses Uganda's High-Frequency Phone Survey to provide a more robust and nationally representative analysis. It identifies the shocks households faced during COVID-19, examines the household-level factors influencing shock severity, and evaluates the coping strategies adopted across diverse socio-economic contexts in Uganda.

1.3 General objective

The overall aim of this study was to analyze the shocks and stresses experienced by households in Uganda during the COVID-19 pandemic, and the coping strategies households adopted in response, in order to strengthen evidence-based resilience planning to increasingly unpredictable shocks.

1.3.1 Specific Objectives of the study

1. To determine the types of shocks and stresses that were experienced by households in Uganda during COVID-19.
2. To examine the household-level factors associated with exposure to and severity of shocks during COVID-19 in Uganda
3. To analyse the coping strategies adopted by households in response to the shocks experienced during COVID-19 in Uganda.

1.4. Research questions

1. What types of shocks and stresses were experienced by households during COVID-19 in Uganda?
2. What social, economic, and environmental factors influence household resilience to shocks?
3. In what ways can household coping and adaptation strategies inform sustainable recovery and development policies?

1.5 Significance of the study

This study is significant in several ways, contributing to both national and global development priorities. First, it aligns with the Sustainable Development Goals (SDGs) particularly SDG 1 (No Poverty), SDG 2 (Zero Hunger), SDG 11 (Sustainable Cities and Communities), and SDG

13 (Climate Action) by generating evidence on how households manage shocks and build resilience. The insights from this study can inform strategies that strengthen community adaptation, reduce vulnerability, and promote inclusive and sustainable recovery.

Second, the study supports the implementation of Uganda's National Development Plan IV (NDP IV), which emphasizes resilient livelihoods, inclusive growth, and sustainable socio-economic transformation. By identifying the factors that enhance or undermine household resilience, the study provides practical recommendations for integrating risk management and adaptive capacity into Uganda's development planning frameworks.

Third, the study contributes to the realization of Uganda Vision 2040, which seeks to transform Uganda into a modern, climate-resilient, and prosperous country. Understanding how households cope with and recover from shocks provides the evidence base needed for designing targeted interventions that build human capital, strengthen social protection systems, and promote sustainable development across sectors.

From a policy perspective, the findings can inform decision-makers at national and local levels on how to design and implement policies that strengthen community resilience, enhance adaptive capacity, and reduce the impacts of recurrent shocks. This evidence can guide investments in social protection, disaster risk management, and local economic recovery initiatives.

Finally, for future researchers, the study offers a conceptual and empirical foundation for further investigation into household resilience dynamics, vulnerability reduction, and sustainable adaptation pathways. It provides a framework for comparative studies across regions and sectors, advancing knowledge on how resilience can be systematically strengthened within development policy and practice.

1.6 Scope of the study

The scope encompassed household-level experiences nationwide, capturing variations across rural and urban settings, livelihood categories, and socioeconomic groups. The study focused on the period from the onset of the pandemic in early 2020 through the subsequent phases of response and recovery, enabling an assessment of both immediate and medium-term impacts. Geographically, the study covered all regions of Uganda which included urban and rural areas of the Central, Eastern, western and Northern regions of the country, with data drawn from sampled households representing the country's diverse demographic and ecological contexts. Conceptually, the study concentrated on shocks related to health, income, food security, and

access to essential services, as well as adaptive strategies such as social support networks, livelihood adjustments, and behavioural responses. The scope did not extend to detailed institutional or macroeconomic policy analysis but remained centred on the lived experiences, vulnerabilities, and resilience capacities of Ugandan households.

1.7 Conceptual Framework

The conceptual framework (figure 1) illustrates the relationship between the shocks that were experienced during the COVID-19 pandemic, factors that influenced the exposure of households to shocks and the various coping strategies that were adopted by households to cope with the shocks. The framework was developed basing on different variables that were included in household questionnaires in rounds 1, 2, 4, 6 and 8. Household experience to shocks was determined by the shocks during the pandemic and these included; death of someone who sends remittances to the household, job loss, floods among other coupled with a number of factors that influenced exposure of households to these shocks. These were both individual level factors (household size, age of household head, sex of household, relation to the household head, residential status, education level) and household level factors (ability to access medical services, access to remittances, ability to education services ability to access medical services, ability/inability to work, access to transport services, source of food consumed by household. This means that households that had access to education and medical services experienced lower exposure compared to those that did not have the ability to access these services. These very factors also shaped the coping strategies the households could adopt during the COVID-19 in such a way that households that were unable to access remittances and those which were unable to work during the pandemic resorted to sale of assets and relying on saving to cope. Therefore, both household and individual level factors influenced the exposure of households to shocks and at the same time influenced the coping strategies that were to be adopted to cope with the shocks.

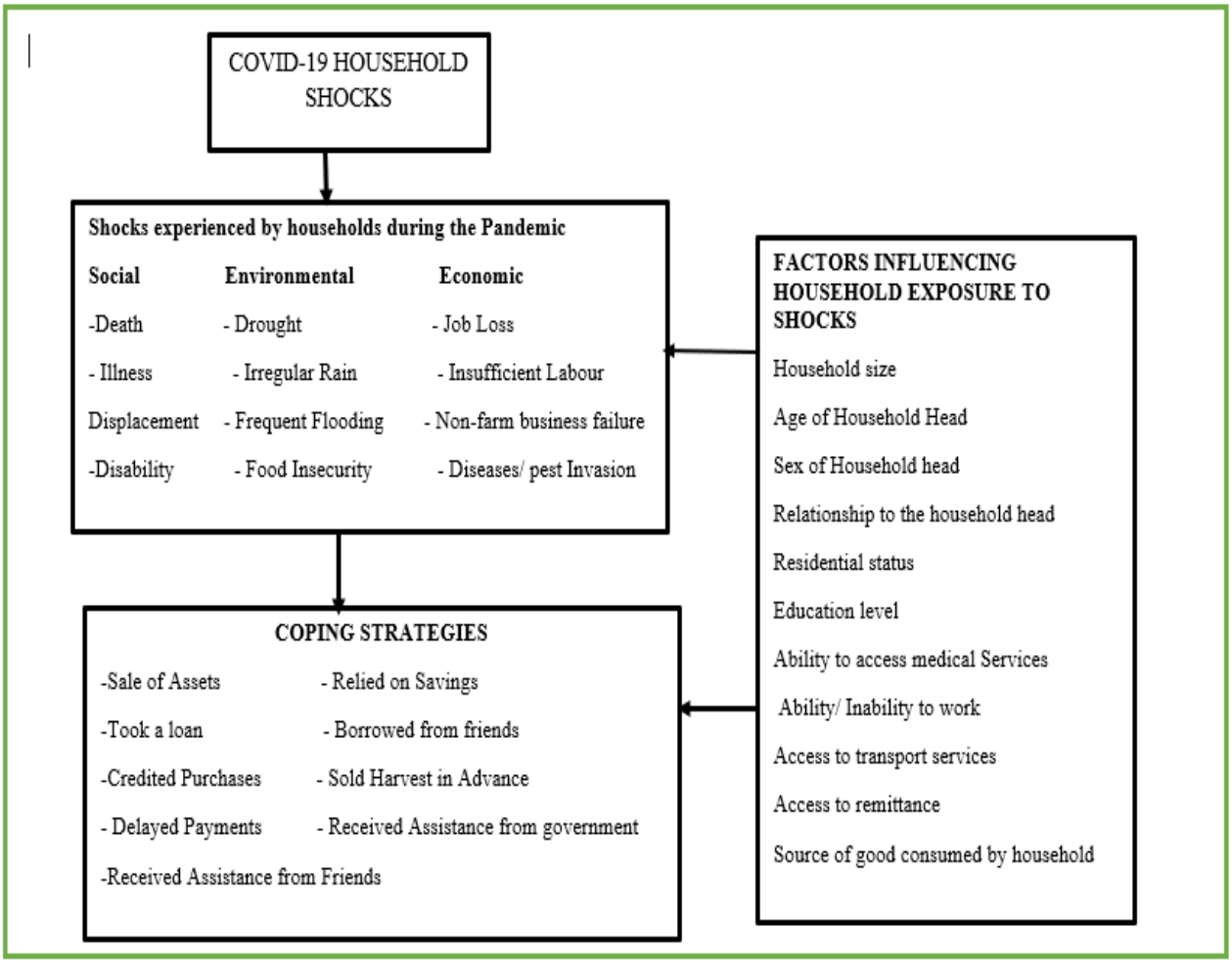

Figure 1: Conceptual Framework

CHAPTER TWO

LITERATURE REVIEW

2.0 Introduction

This section presents a review of the literature in line with the objectives of this study. In the review, key findings from scholars are presented, and agreements and contradictions in the scholarly work are identified, along with knowledge gaps. The review focuses on literature published within the past five years. Keywords and keyword combinations, such as COVID-19 and shocks, COVID-19 and livelihoods, COVID-19 and health, COVID-19 and education, and COVID-19 and household income-generating activities, among others, were used to identify the literature relevant to the study objectives.

2.1 Shocks that were experienced by households during COVID-19

The COVID-19 Pandemic was characterised with significant shocks that resulted into disruptions into day to day life for billions across the globe (Muir et al., 2023). The pandemic amplified significant challenges including hunger, poverty, inadequate access to basic services, and compound crises such as the desert locusts, weather related shocks only worsened the situation (Sharma, et al., 2021). Some of the shocks experienced by these households are explained below:

2.1.1 Food Insecurity

Food security was a major concern during the pandemic and by April 2020, over 23 million people had been pushed into extreme poverty that in the long run exposed the heightened levels of malnutrition and food security to the already affected groups (Nikiema & Dedewanou, 2025). At the peak of the pandemic, the number of food insecure people increased from 32.9 million people from the registered 29.3 million in 2019 and these numbers kept on numbers doubling as the pandemic surged (World Food Programme, 2023). Despite the containment measures being put in place to control the pandemic, most of these had not been designed to mitigate against food insecurity. Several studies were conducted to understand food insecurity during the pandemic (Ben & El, 2024; Doustmohammadian et al., 2023; Maccarthy et al., 2023; Mahmud & Riley, 2023). Studies by (Doustmohammadian et al., 2023) focused on understanding the general overlay of food insecurity and predicted the impacts especially on vulnerable groups. The study was however conducted on a global scale and results may not inform exactly what happened on ground in Uganda. Another study by (Ben & El, 2024) assessed the impacts on household food security on low and Middle income countries,

however, the study was conducted as the COVID-19 pandemic was in its early ages and focused on the immediate impacts of the pandemic. The current study is focused on the post- COVID-19 shocks and thus explaining need to conduct this study for more informed information.

2.1.2 Death

By 2019, the COVID-19 Pandemic had started spreading globally with origins linked to Wuhan China and Africa registered its first case in February 2020. By 2021, more than 100,000 deaths had been registered and about 200 deaths had been registered for Uganda (Eyu et al., 2022). Despite the number of registered COVID-19 deaths decreasing over the years, by 2025, over 7 million deaths had been reported globally (World Health Organization, 2025). The high mortality levels were compounded with inadequacies in testing material availability, differences in access to health care services, demographic and regional disparities among others (Lippi & Sanchis-gomar, 2025). These COVID-19 deaths not only resulted into societal disruption but also reduced the known global life expectancy (West et al., 2021.). Studies were conducted to understand COVID-19 mortality, however most of these didn't examine the impacts that this death had onto the households. Studies by (Mo et al., 2025) assessed the burden of COVID-19 deaths but focused more on the impacts to cancer patients and rather not households that the current study focuses on. Furthermore, studies by (Mattiuzzi & Lippi, 2025) focused on the mortality trends over the first five years of the pandemic. The study was however focused in the USA, a highly developed country that may present varying results from those of Low developing Countries like Uganda where the current study is situated.

2.1.3 Job loss

The global labour market felt significant impact during the COVID-19 pandemic and in 2020, over 255 million full time jobs were lost and this is fourth fold the job losses experienced during the 2009 global financial crisis (Moore, 2024). Low income household were the most affected and women were the most severely affected particularly younger females (Krohne et al., 2025). Small and medium enterprises were also largely affected and the International Labour Organisation reported that about 94% of the populations lost their jobs, as firms were forced to close in observance of the COVID-19 standard operating measures (Gulesci et al., 2020). Besides employed people, self-employed workers were also visibly affected, and informal employment workers were also affected (Arabia & Version, 2020). Existing studies have navigated the key indicators that underpinned job loss trends during Covid 19 (Roy et al., 2021). The study however navigated job loss around the USA, providing a not reliable source

when explaining job loss and how it affected households during the COVID-19 pandemic. Other studies by (Schneider et al., 2024) navigated the employment shocks but focused more on the health impacts on displaced workers. This study outlines that labour market earnings were the primary income source of most households and job loss results into a decline in the standard of living. This however may not relate well for households in Uganda whose major population is majorly agrarian.

2.1.4 Increase in price of inputs

At the onset of the pandemic, Uganda's containment measures significantly affected the supply of consumer inputs and consumer goods that in the long run resulted into an increase in consumer prices (Nabukeera, 2020). For agrarian economies, the global food supply chains was severely affected despite less being documented on how increase in price of inputs affected households (Beckman et al., 2023). This socio-economic threat stressed the food supply chains and domestic food prices increased as agricultural inputs also significantly improved (Kunyanga et al., 2023). Global trade also severely declined by about $2.5 trillion dollars in 2020 and this was reported to be more worse than that of the economic recession of 2015 (United Nations, 2020). Less has however been documented on how increase in price of inputs affected households during the pandemic.

2.1.5 Maternal related shocks

Pregnant women and new mothers, being a unique population with unique health care needs were also affected by COVID-19 (Kotlar et al., 2023). Less is however known about the significant shocks that affected specifically mothers during the COVID-19 pandemic. Studies by (Orene, et al., 2025) indicated that COVID-19 was normally associated with significant morbidity especially among pregnant women as these were disproportionately affected by the pandemic. Other studies by (Chmielewska et al., 2021) reported that the standard operating procedures that were put in place specifically the lockdown, disrupted mothers access to health care services and some changes in still birth and pre-term birth may have been registered during the pandemic. In tandem, studies by (Alabi, 2023) reported that before the pandemic, maternal mortality rate had decreased by about 38% in sub-Saharan Africa, however by 2022 at the peak of the pandemic maternal deaths had increased by 66%. For the mothers that were infected by Covid-19, their chances of giving birth to still births, perinatal death, foetal distress, miscarriage were also reported to have surged during the pandemic (Jummaat et al., 2021).

2.1.6 Weather related shocks

By August 2021, about 139.2 million people had been affected by extreme weather events and about 17,242 of these killed by extreme weather events. The containment measures put in place impoverished the already vulnerable populations and heightened their vulnerability in the face of extreme events (Walton et al., 2021). During this time of the pandemic, the most intense cyclones hit Asia-pacific, heat waves were predominant in Europe and this exacerbated the impacts of the multidimensional COVID-19-climate change crisis (Donoghoe et al., 2022). This pandemic also came at a time when social assistance programs that mitigated on food insecurity, poverty reduction where stopped and this worsened household responses to the compounding extreme weather events (Costella et al., 2023). Weather related shocks were however, less document as a compounding impact of the pandemic, a key aspect that will be captured by the current study.

2.2 Household level factors that associated the shocks among households in Uganda

The Coronavirus pandemic disrupted the education system in the world and this affected students, teachers, parents all over the world (Tadesse & Muluye, 2020). Over 1.5 billion students were affected during the closure of schools. Some studies by (Sawadogo & Ouoba, 2023a) reported that students suffered diverse food insecurity and had to depend on reducing food rations. Most studies on education have however, not considered how education contributed to shocks that were prevalent during the pandemic. Existing studies by (MacDonald & Hill, 2022) assessed the educational impact of the pandemic and how various groups including teachers, students and families responded during the pandemic. As much as these were affected, the study doesn't directly present how education was directly associated with the shocks during the pandemic. Similarly other studies by (Duby et al., 2022; Jones et al., 2021; MacDonald & Hill, 2022) all addressed education as a key sector that was affected during the pandemic, but didn't provide an understanding of how it was directly associated with the shocks.

Similarly, studies presented how age of an individual contributed to how they were affected by the COVID-19 Pandemic. Studies by (Yu et al., 2020) reported that in China, people aged 20-39 years led the pandemic process, and the elderly group aged above 60 fell behind the younger group with significant fluctuations among the groups. Elder people were not severely affected as these measures like contact testing, mass testing, proper personal protection was put in place. This however varied with what was reported by (Baena et al., 2023; Crimmins, 2020)who

reported that older people were more prone to the COVID-19 shocks as the pandemic worsened the already existing health issues among the old people. Studies addressing household level factors and their contribution to shocks are however still limited and this dearth of information is what has necessitated the current study

2.3 Coping strategies adopted by households during COVID-19

As the COVID-19 pandemic surged, various countries rushed to put in place several containment measures to protect communities, residents and households to minimise the impact of COVID-19. Some of these including reducing rational consumption, eating less expensive food, engaging in small scale productivity activities, Mortgaging and selling domestic products among others (Okidim et al., 2021). Studies by the (International Growth Center, 2020) assessed the various strategies that were adopted to cope up with COVID-19. Some of these programs included short term and labour intensification programs, enhancing collaboration with the civil society, building public trust among others. The study however focused its scope on the economic side of coping up and households were excluded from this study despite it being the main focus of this study. A study by (Concern Worldwide, 2021) presented the various coping strategies that were adopted by several countries to contain the COVID-19 pandemic. Some of these measures included suspension of all formal meetings, lock down, mandatory use of face masks, closure of public spaces like markets. Schools were also closed; inter-district travel was closed among others. Despite presenting all these findings, Uganda was excluded and the coping strategies were generalised not to cover households.

Other studies by (Aga & Maemir, 2021) focused their scope on how African firms managed to cope up during the pandemic. Some of these included some firms receiving direct government support as they navigated the crisis, others were however left behind and not helped at all during the recovery phase. Other strategies initiated in this study involved allowing firms to work remotely, delivering goods and services to replace the onsite services. Similarly, household coping strategies were excluded. Several other studies had findings similar to this study for example a study by (Mishi et al., 2023). This study presented several coping measures including adjusting cost measures, online transitions, reskilling staff, retrenchment and even temporary closures. However even with these in place, some businesses found it very difficult to change their business model operations and some had to quit business. This study focused on only businesses and this creates a dearth of information in contemplating what exactly happened at household level. Studies by (Austin et al., 2025) reported on the potential of households in coping up with economic shocks. Some of these including observing influence

of lockdown policies, accessing commercial loans, asking for community assistance, and asking loans from employers.

This gap was considered in studies by (Okidim et al., 2021), who presented key strategies rural households adopted in coping up with the COVID-19 pandemic. This study presented strategies like buying food in credit, borrowing money to buy food, skipping meals within a day. Allowing children to eat first among others. Thus, study despite presenting key similarities with the current study focused on only rural households yet the current study will focus on both urban and rural households. The study also focused on only food insecurity as a key shock that affected households. The current study will integrate more than just food insecurity and will focus on more than one shock. Similarly a study by (Sawadogo & Ouoba, 2023a) also focused on food coping strategies such as doing small activities for additional income, send children elsewhere burden, send children to beg, take out a loan, and purchasing food on credit. Studies by (Regina Garai Abdullah et al., 2021) also presented coping strategies such as food preservation, stocking up food, eating less food among others. The study was conducted in a Malaysian setting and may not directly inform what happened in a Ugandan setting.

Other studies by (Osabuohien et al., 2024) assessed the various household welfare and diversification strategies including food purchasing, sale of assets, credited purchases, reduced food consumption, and relying on savings. The study however focused on small holder farmers yet the current study will generalise households in Uganda. Studies by (Palma & Araos, 2021) assessed coping strategies adopted by households during the pandemic. The study provided a gendered perspective by presenting a female headed household perspective on the coping strategies adopted during COVID-19. All these studies have however, not presented a detailed understanding of what happened on households in Uganda where the current study is situated presenting need for conducting this study.

2.4 Research gaps

As per the literature, the following gaps have been identified, which the study intended to bridge. While numerous studies have explored household responses to COVID-19-related shocks globally, most are concentrated in high- and middle-income countries. Therefore, little empirical evidence exists for Uganda, where households face unique vulnerabilities shaped by informality, limited social protection, and exposure to multiple compounding shocks. This lack of context-specific data limits policymakers' ability to design targeted, effective interventions for low-income countries.

Most existing literature on COVID-19 mortality has focused on clinical outcomes or impacts on specific patient groups, for example, cancer patients, rather than on the broader household-level consequences of losing a family member. The death of an adult working member or caregiver can significantly alter household dynamics, increase vulnerability, and trigger long-term socio-economic implications, and yet these impacts remain underexplored. There is a notable gap in understanding how internal household characteristics, such as education level and age of household head, contribute to vulnerability or resilience during crises. While some studies acknowledge these variables, few offer a systematic analysis of their roles in shaping household responses and outcomes during overlapping shocks such as pandemics and climate events. Studies focused on the economic side of coping strategies and excluded households. In addition, studies excluded Uganda, and the coping strategies were generalised not to cover households. Studies focused solely on businesses, thereby creating a dearth of information about what happened at the household level. Studies also focused only on rural households and only on food insecurity as the key shock affecting households. Studies also assessed the various household welfare and diversification strategies, but they however focused on smallholder farmers. Studies did not present a detailed understanding of what happened in households in Uganda where this current study is situated. This study, therefore, aims to address these gaps on nationally representative datasets.

Existing literature on household responses to shocks has employed a range of methodological approaches including cross sectional, primary household surveys, qualitative case studies and experimental designs. While these studies provide insights into coping mechanisms, they often suffer from methodological limitations such as recall bias, limited geographical coverage, and small sample sizes and in ability to capture evolving crises. Studies by (Doyle et al., 2021) on lessons from the COVID-19 response in Uganda were designed to be a rapid appraisal of the initial phases of the ongoing social protection responses to COVID-19 but were limited due to wide spread travel restrictions which prohibited primary data collection and therefore doesn't fully assess how these social protection responses have been implemented in practice but rather focused on the design features of the chosen response options limiting understanding of how household responses evolved over the course of the pandemic. This study addresses this methodological gap by using nationally representative High Frequency Phone Survey data, which allows analysis of household responses which is longitudinal and across multiple livelihood dimensions.

CHAPTER THREE

DESCRIPTION OF STUDY AREA AND METHODOLOGY

3.0 Introduction

This chapter gives a detailed description of the study area, research process, and research design. It explains and justifies the procedures and methods used.

3.1 Description of the study area

3.1.1 Location

The study was conducted in Uganda also known as the "Pearl of Africa". The country is located in East Africa astride the equator. Uganda is located within a latitude of 4.5^0N to 1.5^0S and a longitude of 29^0E to 35.2^0E (Ngoma et al., 2021). Uganda borders Kenya in the East, South Sudan in the North, Rwanda in the South west, Tanzania in the south, and Democratic Republic of Congo in the West (US Mission, 2019) The largest lake in Africa, that is Lake Victoria shares much of its western shoreline with Uganda and it is also the source of the longest River in Africa that is River Nile. Uganda's total land surface area is about 241,500km^2 of which 194,000km^2 is land and the rest is open water and wetlands. It is also one of the least urbanized in Africa (Ministry of Lands, 2006). Uganda's lowest elevation is 614 meters located within the Albertine graben and the highest point is 5111 meters (16,768ft) located around Margherita peak on the Rwenzori (World Bank Group, 2021)

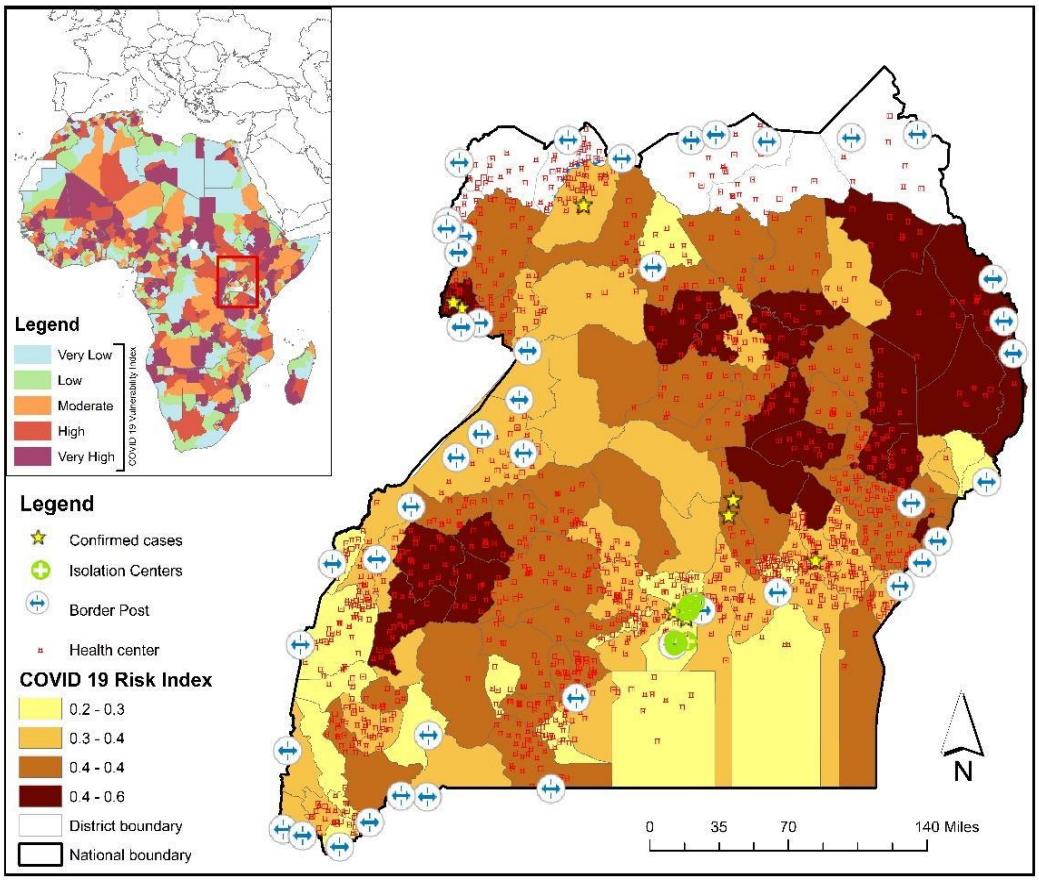

Figure 2: Map of Uganda (Source: Author's creation, 2025).

3.1.2 Climate and drainage

Uganda's climate is largely tropical with majority of the regions receiving a bimodal rainfall pattern with two rainfall seasons that is the 'MAM' season seen in March to April (long rains) and the SON season (short rains) in September to November (Irish Aid, 2017). The region experiences moderate temperatures throughout the year. Temperature however vary from 0^0C in the ice-capped Rwenzori ranges with permanent Ice-caps (Ngoma et al., 2021).. The North-Eastern areas of the country that is Gulu, Kitgum and Moroto normally receive temperatures of up to 30^0C (World Bank Group, 2021). In terms of rainfall amounts received, variations across regions are more common. The southern part of the country receives between 600 to 2200mm of rainfall annually and the northern part receives amounts ranging between 400mm to 1600mm per annum (Climate Risk Country Profile, 2021). Uganda's water resources include lakes like Lake Victoria, Albert, George and others, wetlands and rivers. All of Uganda drains into the Nile. With this kind of climate and drainage pattern, shocks like floods, food insecurity, erratic rainfall, dry spells are more likely to be common. During COVID-19, these presumably normal occurrences overlapped with the pandemic induced shocks, some of that arose due to

adherence to the COVID-19 Standard Operating Procedures such as disrupted agricultural production, food supply chains, livelihood distortion among others. Areas in low-lying urban zones also experienced heightened vulnerability to shocks such as waterborne diseases and this was worsened by the pandemic because at such a time, the public health systems were already overwhelmed by the pandemic which made coping up to the double tragedies almost impossible,

3.1.3 Vegetation

The study area a has a bio diverse vegetation ranging from bushy grasslands, acacia woodlands, open woodland, savanna forest, tropical forest, montane forest, riparian forest, grasslands, outcrops, marshes, craggy hills, extensive wetlands and bush thickets (Ministry of Water and Environment, 2021). The most dominant vegetation type is the Savannah Vegetation found majorly in the arid and semi-arid regions. Montane Vegetation is also found near the mountainous areas (NEMA, 2016). The region also has predominant swampy vegetation especially along the major lakes and rivers. The Vegetation has however been modified by human activities including deforestation, bush burning, grazing which has reduced the vegetation in quality and quantity over time. Most communities in Uganda are highly dependent on natural eco-systems(US Mission, 2019). The heavy dependence of rural populations on these ecosystems made households highly vulnerable especially during the enforcement of the Standard Operating Procedures (SOPs) including lockdowns and market closures that disrupted economic activities for these vulnerable populations.

3.1.4 Topography and soils

Uganda's relief largely lies between 900-1500 meters above sea level and the lowest point goes as low as 621m above the sea level (L. Albert region) and the highest point going as low as 5110m (Mt Rwenzori's Margherita peak) (Climate Risk Country Profile, 2021). A physiographic analysis of Uganda shows that the country is divided into four major physiographic regions that is Mountains (areas above 2000m), the Uplands (areas between 1,500 and 2000m a.s.l.), the Plateau lands (areas between 900 - 1,500m a.s.l.) and the lowlands (areas between 600 - 900m a.s.l.). The largest percentage of the land surface in Uganda is a plateau. This plateau is higher in the south and lowest in the center (Kyoga down warped region). Uganda is endowed with a variety of soils and these present different characteristics and capabilities. The geology of the country is mainly composed of pre-Cambrian and Cenozoic rocks of strongly weathered granites and sediments. The soils are relatively young and fertile, with high calcium, potassium and sodium contents. They are mainly andosols,

nitisols, laterites and vertisols with a high clay content. An estimated 41% of Uganda's soils have however experienced severe degradation. In regions with degraded soils, reduced agricultural productivity amplified food insecurity and economic vulnerability making households more reliant on alternative unsustainable livelihood strategies and these risks despite being already existent were heightened by the COVID-19 Pandemic.

3.1.5 Population

Uganda's population is projected at 46 million currently with a notable population growth rate of 3.0%. This population has been attributed to the high fertility rates but also a high but declining mortality. The Total Fertility rate is around seven children per woman but this has decreased to 5.2 children per woman in 2023. Majority of the country's population are youths aged between 15-64 years and 44% are aged between 0-14 years and only 3% are aged 65 and above. The country is urbanizing at a rate of 5.2% annually (National Population Council, 2023). Uganda has a pre-dominantly younger population aged under 15 years of age. Majority of these are still enrolled in schools and the sudden closure of schools and restrictions due to observance of the COVID-19 SOPs disrupted education and employment for these vulnerable groups. . Furthermore, large household sizes and densely populated urban areas facilitated the spread of COVID-19 while also limiting households' capacity to absorb income and food security.

3.2 Methods

This study was based on secondary data derived from the Uganda High-Frequency Phone Survey (UHFPS), which is a nationally representative longitudinal household survey implemented by the Uganda Bureau of Statistics (UBOS) in collaboration with the World Bank to monitor socio-economic impacts of the COVID-19 pandemic. The survey was initiated in 2020 in response to mobility restrictions that limited the feasibility of primary data collection. The survey was conducted due to the fact that as governments implemented various containment measures, there was need to understand how households in the country were affected and responded to evolving crises in order for policy responses to be designed well and targeted well. Therefore, the original objective of this survey was to monitor the socio-economic effects of COVID-19 and its restrictions.

The UHFPS was proposed to have multiple rounds (17) collected from 2020-2024 to accommodate the evolving nature of the crisis and questionnaires were revised to adapt to crises develops. Each round consisted of different number of households and here information about the shocks, socio-economic effects of these shocks such as food price fluctuations,

income losses, and food insecurity was captured. All households not explicitly refusing to participate in the survey were interviewed. The survey employed a nationally representative sample of households and conducted a series of phone interviews at regular intervals. This approach allowed for continuous monitoring of changes in household welfare, food security, income, employment, and access to essential services. This study considered data collected in rounds 1-8 which were collected between 2020 and 2022, capturing longitudinal data on various dimensions of household welfare. These included income and employment dynamics, food security status, access to essential services, and coping strategies adopted in response to emerging crises. Conducting the high frequency phone survey was relevant because it enabled rapid data collection during the COVID-19 pandemic especially when face to face surveys were not feasible due to the movement restrictions hence allowing for timely monitoring of the household shocks and responses as the pandemic evolved. As well the repeated survey rounds allowed for tracking changes in household experiences overtime making it possible to observe how shocks and coping strategies evolved the different phases of the pandemic.

3.2.1 Research design

This study adopted a case study research design within a quantitative analytical framework. The design was appropriate because it allowed for an in-depth examination of household welfare and food security dynamics within a specific context using secondary data. By focusing on the HFPS, the case study design facilitated a detailed exploration of how households experienced and adapted to socio-economic and environmental shocks over time. The case study approach was particularly suitable as it enabled contextual analysis of changes in household conditions and coping mechanisms, drawing evidence from a well-established national dataset. This approach emphasized the understanding of complex interrelationships between household characteristics, livelihood sources, and food security outcomes, rather than merely describing statistical trends.

3.2.2 Data acquisition

The HFPS data used in this study were obtained from the World Bank Microdata Library, an open-access platform that provides standardized datasets for research and policy analysis. Data acquisition involved downloading the eight rounds of the Uganda High-Frequency Phone Survey (HFPS) conducted between 2020 and 2022 (Table 1), following the approval of a data access request through the Microdata Library's registration system. Each round of the HFPS

comprised both household- and individual-level information, collected through structured phone interviews administered by the Uganda Bureau of Statistics (UBOS) in collaboration with the World Bank. The interviews captured a wide range of indicators related to household welfare, food security, employment, income sources, and access to essential services, providing a rich dataset for socio-economic analysis.

Table 1. Different rounds of data

Round	Start date of collection	End date of collection	Households reached
Round 1	03/06/2020	06/16/2020	2,227
Round 2	30/07/2020	19/08/2020	2,199
Round 3	14/09/2020	16/10/2020	2,147
Round 4	27/10/2020	17/11/2020	2,136
Round 5	02/02/2021	18/02/2021	2,122
Round 6	22/03/2021	09/04/2021	2,1940
Round 7	20/09/2021	15/11/2021	1,950
Round 8	21/06/2021	15/07/2022	16,929

3.2.3 Sampling technique and sample size

The study utilized a purposive sampling approach in selecting data from the Uganda High-Frequency Phone Survey (HFPS), focusing specifically on Rounds 1, 2, 4, 6, and 8. Although the HFPS employed a nationally representative sample of households originally drawn from the Uganda National Panel Survey (UNPS), this study purposively extracted households that participated across the selected rounds to ensure consistency. This approach allowed for the assessment of temporal changes in household welfare, food security, and socio-economic outcomes over time.

A total of 14,745 households were included in the study sample. These households were drawn from both urban and rural areas in all regions of Uganda (Central, Eastern, Eastern, Northern), reflecting the national distribution and diversity of socio-economic conditions in Uganda. By using data from multiple survey rounds, the study was able to track changes within the same households, thereby improving the reliability of trend analyses and enhancing the robustness of findings. The selected sample size was sufficient to provide statistically meaningful insights

and to support disaggregation by key variables such as region, household composition, and livelihood sources.

3.2.4 Inclusion and exclusion Criteria

Households were included if they participated in at least one of the selected HFPS rounds and had complete information on key variables such as income, food security, and access to services. Only households with valid and consistent identification codes across rounds were retained. Households were excluded if they had missing or incomplete data on critical variables, inconsistent identifiers across rounds, or if they were part of survey pilot tests or non-residential units. The application of these criteria ensured that the final dataset was reliable, nationally representative, and suitable for analysis.

3.2.5 Data processing and management

After acquisition, the HFPS datasets were imported into SPSS software for processing. Household identification codes were verified across rounds to ensure consistency for longitudinal analysis. Data cleaning involved removing duplicates, correcting inconsistencies, and handling missing values. Variables were extracted, recoded, and standardized to maintain comparability across rounds. The cleaned datasets were then merged into a single dataset, allowing for the tracking of household-level changes over time. All variables were appropriately labeled and validated to ensure data integrity and readiness for analysis

3.3 Data analysis

The study employed various analysis methods to understand household responses to shocks and stresses during COVID-19 in Uganda. Data input and analysis were conducted using JMP software, version 13 (JMP Statistical Discovery LLC, North Carolina, USA) and SPSS (Standard Package for Social Scientists). The high frequency phone survey has been used in several studies to examine impacts of the pandemic for example (Mukoki et al., 2024) utilized the HFPS to investigate the impacts of the COVID-19 lockdown measures and their associated self-reported threats on Female Labor Force participation in Uganda following the March 20th, 2020 shutdown of the economy , another study by (Mahmud & Riley, 2023) used the HFPS to examine the impact of COVID-19 crisis on rural households and termed the data set as credible since it was designed and implemented by the World Bank in collaboration with UBOS and as well allowed to look at the short term and medium impacts of the shocks since It was longitudinal.

Descriptive statistics was employed on all variables to generate percentages of household

responses to shocks during the pandemic. Further analysis was conducted examine the factors that influenced severity of shocks among households and also the logistic regression to understand the coping strategies adopted by households during COVID-19 in Uganda. Chi-square tests (binary analysis)were performed to determine the association between the independent and dependent variables.

Potential factors were selected at $p < 0.05$ using simple logistic regression. They were then entered into a multivariate logistic regression using a backward stepwise strategy to obtain adjusted estimates. For each the logistic regression, the indicators used to measure the association between the dependent and independent variables were the adjusted odds ratio (*OR*) and the 95% CI. The significance level was 5%. Detailed analysis for each objective is explained in details below;

3.3.1 Data analysis for objective 1&2

The data collected from rounds 1, 2, 4, 6 and 8 of the High-Frequency Phone Survey (HFPS), comprising 14,745 households. Initially, descriptive statistics were ran to understand the basic characteristics of the study sample. For Objective 1, Descriptive statistics were ran to understand the nature of shocks that households experienced during the pandemic. Cross tabulations were further ran to rank the shocks that various households experienced during the pandemic and their severity. Rankings based on “Severe”, “Most Severe” and “More Severe” were adopted for this Objective. To understand the factors that influenced the severity of shocks among households during COVID-19, logistic regression analysis was employed. Logistic regression was chosen because the dependent variable, household shock severity, was binary, coded as 1 for severe shocks and 0 for moderate or mild shocks. This method allowed for the estimation of the odds of experiencing severe shocks while simultaneously controlling for multiple individual-level and household-level factors, including demographic characteristics, socioeconomic status, access to services, livelihood conditions, and exposure to environmental shocks. The large sample size and inclusion of multiple survey rounds enhanced the statistical power and allowed for capturing temporal variations across the pandemic period. Prior to modelling, the data were cleaned, coded, and cross-checked for inconsistencies. Continuous variables, such as household size and age of the household head, were standardized, while categorical variables were coded with clear reference categories. The model was estimated using maximum likelihood estimation, and results were presented as odds ratios with 95% confidence intervals to facilitate interpretation. Statistical significance was assessed at a 5%

level ($p < 0.05$), providing a robust framework for understanding the determinants of household vulnerability during the pandemic.

3.3.2 Data analysis for objective 3

Descriptive analysis of data was done to have summarized statistics of the various coping strategies that were adopted by households during COVID-19. Bivariate analysis refers to a statistical method that assesses how different things are associated. Bivariate analysis examines the relationship between two variables without examining any cause-and-effect relationships. The dependent variable to be considered for the study was first identified as shown in equation 1, below following a binary format,

$$Y = \begin{cases} 1, If\ the\ Household\ adopted\ a\ Coping\ Strategy\ (eg., Sold\ assets\ \ldots\ldots \\ 0, If\ the\ household\ didn't adopt\ the\ strategy \end{cases}$$

The independent variable to be considered for the study was later defined and the variables included,

Variable	Symbol	Description
Age of household head	X_1	Continuous
Gender of the household head	X_2	(1=Male, 0=Female)
Household Size	X_3	Continuous
Income Level	X_4	Continuous

The Logistic regression equation considered for the analysis is as follows;

$$\text{logit}(P) = \ln\left(\frac{P}{1-P}\right) = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \cdots + \beta_k X_k$$

Where,

- P=Pr(Y=1, X1, X2,...,Xk) is the probability that a household adopts the coping strategy.
- β_0 is the intercept.
- Bi are the coefficients measuring the effect of each independent variable Xi on the log odds of adopting the coping strategy.

Furthermore, chi square test was used to assess the association between the outcome and independent variables.

3.3.3 Limitations of the study

This study used longitudinal data from the 2020-2022 High Frequency Phone Survey data set where households without access to mobile phones were excluded yet these were amongst the most vulnerable therefore underestimating the severity of shocks and vulnerability. There was as well limited depth of information since phone surveys typically involve shorter questionnaires which can restrict the depth of information collected compared to face to face interviews and since the study was longitudinal, there was sample attrition over time as some households became unreachable which affected the data. In the HFPS, households are asked to report whether they experienced climate-related shocks such as drought or irregular rainfall, these responses are therefore based on household own experiences and understanding rather than technical weather measurements. As a result, the survey does not separate long periods of drought from shorter-term changes in rainfall patterns which may lead to an overlap in reporting shock categories.

3.4 Ethical considerations

This study obtained ethical clearance from the Directorate of Research and Graduate Training and the department of Geography, Geo-informatics and Climatic Sciences, Makerere University. Since the data obtained from the study is open source data, all the formalities and ethics attributed to use of open data will be considered. The researcher used secondary data from the Uganda's High-Frequency Phone Survey (UHFPS) 2020-2022. Secondary analyses of all data acquired were approved under all the ethical Protocols.

CHAPTER FOUR

PRESENTATION OF STUDY RESULTS

4.0 Introduction

This chapter focuses on the analysis and presentation of results from the Uganda High Frequency Phone Survey Dataset, carried out in rounds 1, 2, 4, 6, and 8. The findings presented in this chapter are organized into four sections: analysis of the demographic characteristics of the study participants; shocks experienced by households; factors influencing household exposure to shocks; and coping strategies adopted by households during COVID-19 in Uganda.

4.1 Demographic characteristics of the study participants

The demographic profile of the 14,745 households (Table 2) in the study shows that the majority were male-headed (71%), while female-headed households accounted for 29%. The age of household heads ranged from 18 to 80 years, with most (approximately 58%) falling within the economically active age group of 25–44 years, highlighting the vulnerability of working-age households to income and employment shocks during the COVID-19 pandemic. The average household size was about 5 members, with half of households having 4–6 members, indicating moderate dependency ratios that may influence coping capacity.

In terms of education, the largest proportion of household heads had attained primary education (45%), followed by secondary education (30%). In comparison, 18% had no formal education, and only 7% had a tertiary education, reflecting generally low levels of formal education that could affect access to information and adaptive capacity. Most households were rural-based (68%), with the remaining 32% residing in urban areas, and were distributed relatively evenly across Uganda's four regions that include Central (27%), Eastern (25%), Northern (24%) and western (24%). Regarding employment, 60% of household heads were employed, either in wage employment, self-employment, or agricultural activities, whereas 40% were unemployed or engaged in non-wage family labour. Finally, the majority of household heads were married (67%), with single (20%) and widowed/divorced (13%) households forming the remainder.

Overall, these demographic characteristics provide essential context for understanding household-level exposure to COVID-19–related shocks and the variation in coping strategies across household types, regions, and socio-economic conditions.

Table 2. Summary of demographic characteristics

Characteristic	Category	Frequency (n)	Percentage (%)
Gender of Household Head	Male	10,475	71
	Female	4,270	29
Age of Household Head	18–24 years	1,482	10
	25–34 years	4,118	28
	35–44 years	4,422	30
	45–54 years	2,962	20
	55–64 years	1,109	8
	65+ years	652	4
Household Size	1–3 members	3,686	25
	4–6 members	7,372	50
	7+ members	3,687	25
Educational Attainment of Household Head	No formal education	2,655	18
	Primary	6,636	45
	Secondary	4,424	30
	Tertiary	1,030	7
Place of Residence	Rural	10,025	68
	Urban	4,720	32
Regional Distribution	Central	3,981	27
	Eastern	3,686	25
	Northern	3,539	24
	Western	3,539	24
Employment Status of Household Head	Employed	8,847	60
	Unemployed	5,898	40
Marital Status of Household Head	Married	9,872	67
	Single	2,949	20
	Widowed/Divorced	1,924	13

4.2 Shocks and stresses that were experienced by households during COVID-19 in Uganda

This section examines the range of shocks and stresses experienced by households in Uganda during the COVID-19 period. Using data collected across multiple survey rounds, the analysis captures both climate-related and non-climate-related shocks affecting livelihoods, food security, and overall household wellbeing. The section highlights the prevalence and evolution

of these shocks over time, providing insight into how the COVID-19 crisis interacted with existing environmental and socio-economic vulnerabilities.

4.2.1 Climate related shocks and stresses during COVID-19 in Uganda

This subsection presents the climate-related shocks and stresses experienced by households in Uganda during the COVID-19 period. Using survey data collected across multiple rounds, the analysis highlights the prevalence and temporal evolution of key climatic shocks, including drought, flooding, delayed or irregular rainfall, and crop destruction or failure. The findings provide insight into how climatic stressors evolved alongside the COVID-19 crisis and contributed to household vulnerability during this period.

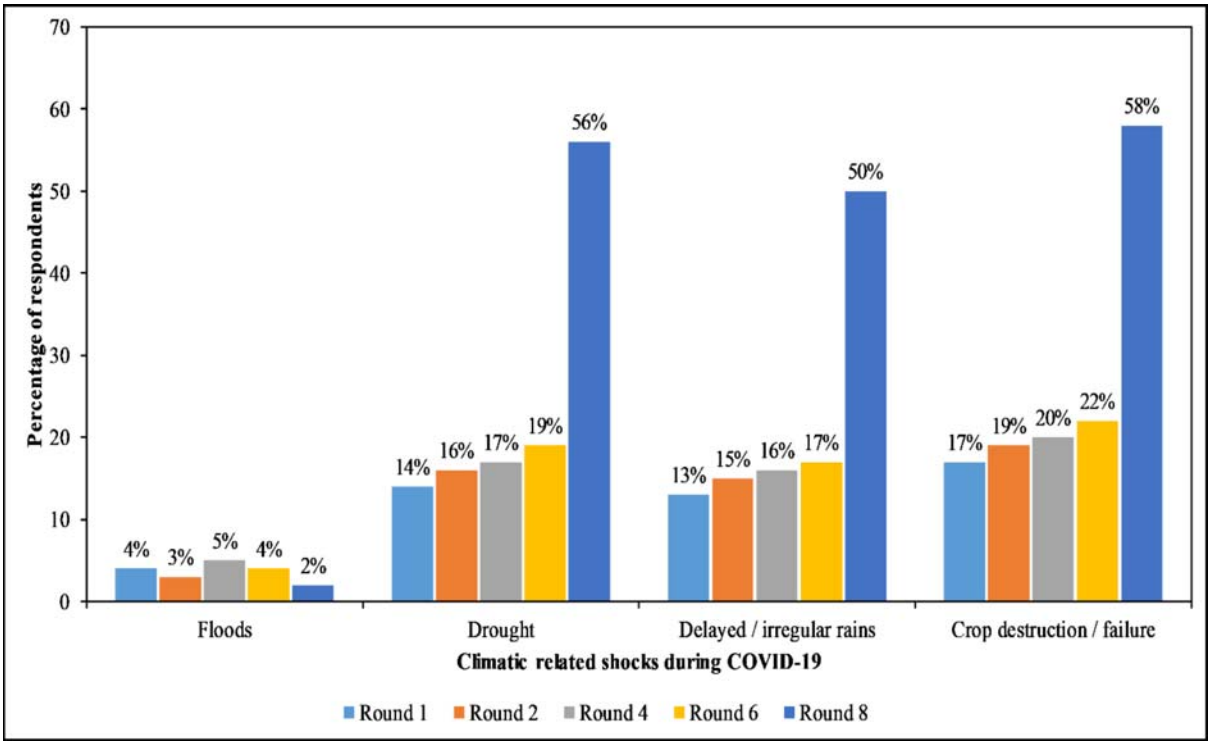

Figure 3. Climate related shocks and stresses experienced by households during COVID-19

Figure 3 illustrates the proportion of respondents who experienced selected climate-related shocks during different survey rounds conducted in the COVID-19 period in Uganda. Overall, the results indicate a progressive increase in the prevalence of climate-related shocks over time, with notable differences across shock types.

Flooding was reported by a relatively small proportion of respondents throughout the survey period, ranging from 2% to 5%, indicating that floods were the least frequently experienced climatic shock during the COVID-19 period. In contrast, drought emerged as a major climatic

shock, with the proportion of affected respondents increasing steadily from 14% in Round 1 to 56% in Round 8, reflecting a substantial escalation in drought conditions as the pandemic progressed.

Similarly, experiences of delayed or irregular rains showed a consistent upward trend, rising from 13% in Round 1 to 50% in Round 8. This pattern suggests increasing rainfall variability, which likely disrupted agricultural activities and seasonal planning during the COVID-19 period. The most pronounced increase was observed in crop destruction or failure, which rose from 17% in Round 1 to 58% in Round 8, making it the most commonly reported climatic shock by the final survey round. Taken together, the findings demonstrate that while flooding remained relatively minimal, drought, rainfall irregularities, and crop failure intensified significantly during the COVID-19 period, underscoring the compounding effects of climatic stressors on livelihoods and food systems during a public health crisis.

4.2.2 Non-climate hocks and stresses during COVID-19 in Uganda

This section presents the non-climatic shocks and stresses experienced by households in Uganda during the COVID-19 period. Drawing on data from multiple survey rounds, the analysis focuses on key economic, health, and social stresses, including employment and income losses, price increases, health-related shocks, and disruptions to remittances and security. The results highlight how non-climate factors interacted with the pandemic to shape household vulnerability over time.

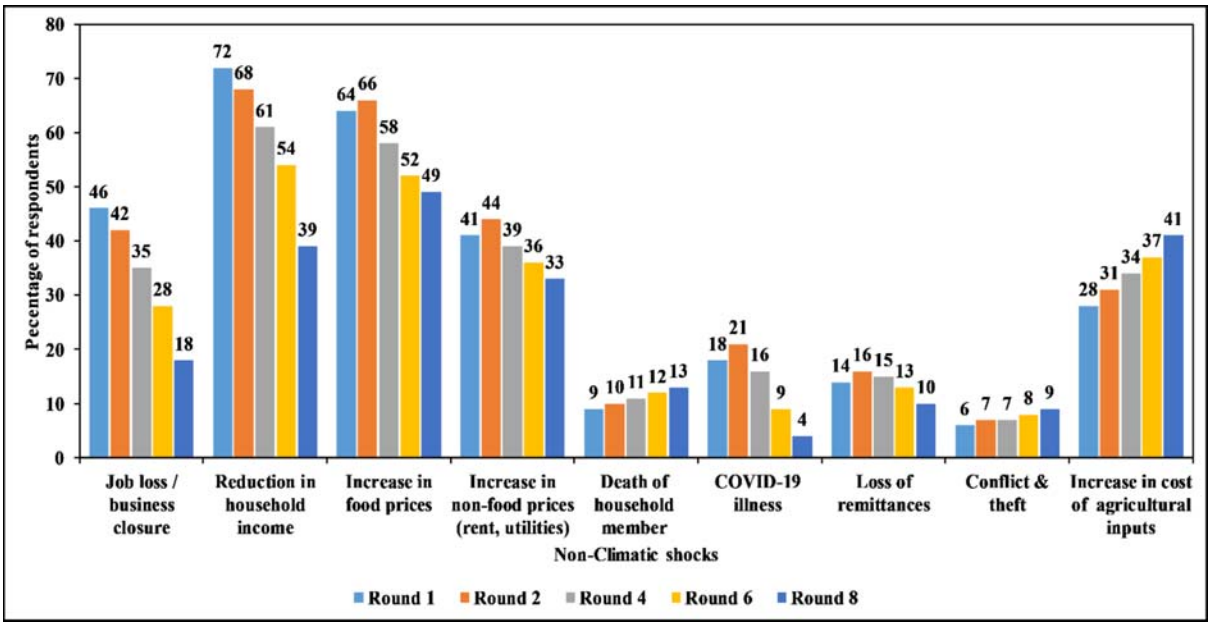

Figure 4. Non climate shocks and stresses experienced by households during COVID-19

Figure 4 presents the proportion of respondents reporting selected non-climatic shocks and stresses experienced during the COVID-19 period across multiple survey rounds in Uganda. The results indicate that economic and price-related shocks, were the most prevalent non-climatic stresses, while health- and security-related shocks affected a relatively smaller proportion of households. Loss of employment or business closure was widely reported in the early rounds, affecting 46% of respondents in Round 1, but declined steadily to 18% by Round 8, suggesting a gradual easing of pandemic-related economic restrictions over time. Similarly, reductions in household income were reported by a large share of respondents, decreasing from 72% in Round 1 to 39% in Round 8, although income losses remained substantial throughout the study period.

Increases in the cost of living were a persistent challenge. Food price increases affected between 64% and 66% of respondents in the early rounds, declining to 49% by Round 8, while non-food price increases (including rent and utilities) remained relatively high, decreasing from 41–44% to 33% over the same period. These trends indicate sustained inflationary pressures during the COVID-19 period. Health-related shocks, were reported by fewer households. COVID-19 illness declined markedly from 18–21% in Rounds 1 and 2 to 4% in Round 8, while death of a household member showed a slight upward trend, increasing from 9% to 13% across rounds. Loss of remittances affected 14–16% of households in earlier rounds, falling to 10% by Round 8.

Security-related shocks such as conflict and theft were consistently reported by a small but gradually increasing proportion of respondents, rising from 6% in Round 1 to 9% in Round 8. In contrast, the increase in the cost of agricultural inputs showed a clear upward trend, rising steadily from 28% in Round 1 to 41% in Round 8, highlighting growing production challenges for agricultural households. Overall, the findings demonstrate that while some non-climatic shocks such as job losses and COVID-19 illness declined over time, income losses, price increases, and rising agricultural input costs remained persistent stresses, exacerbating household vulnerability during the COVID-19 period.

4.2.3 Comparative analysis of climatic and non-Climatic shocks and stresses during COVID-19 in Uganda

A comparison of climatic and non-climatic shocks and stresses experienced during the COVID-19 period reveals important differences in their timing, intensity, and persistence, as well as

their implications for household vulnerability. While both categories of shocks affected households simultaneously, non-climatic shocks were generally more immediate and widespread at the onset of the pandemic, whereas climatic shocks intensified progressively over time.

Non-climatic shocks and stresses, particularly loss of employment, reduction in household income, and increases in food and non-food prices, affected a large proportion of households during the early survey rounds. These shocks were closely linked to COVID-19 containment measures, market disruptions, and mobility restrictions. Although some of these shocks, such as job losses and COVID-19 illness, declined in later rounds, income losses and high living costs remained persistent, indicating slow economic recovery and prolonged financial stress for households. In contrast, climatic shocks such as drought, delayed or irregular rainfall, and crop destruction or failure exhibited a clear upward trend over time. Unlike non-climatic shocks, which peaked early, climatic shocks became more pronounced in later survey rounds, suggesting cumulative environmental stress during the pandemic period. Crop failure emerged as the most severe climatic shock, directly undermining agricultural production and food availability.

The interaction between these two categories of shocks and stresses appears to have amplified household vulnerability. Climatic shocks constrained agricultural production and food supply, while non-climatic shocks reduced household purchasing power and access to income. This convergence likely exacerbated food insecurity and limited households' ability to cope or recover, particularly for those dependent on rain-fed agriculture and informal livelihoods. Overall, the findings indicate that non-climatic shocks dominated the initial phase of the COVID-19 crisis, while climatic shocks increasingly shaped household stress in the later stages. The overlapping nature of these shocks and stresses underscores the importance of integrated policy responses that address both socio-economic recovery and climate resilience in managing compound crises.

4.3 Factors that influenced the severity of shocks among households during COVID-19 in Uganda

To examine the factors influencing the severity of household shocks during COVID-19 in Uganda, a binary logistic regression model was estimated using pooled data from rounds 1, 2, 4, and 6 of the High-Frequency Phone Survey (HFPS). The dependent variable was the severity of household shocks (1 = severe, 0 = moderate/mild). The explanatory variables included both

individual-level factors (household size, age of household head, sex of household head, residence type, and education level) and household-level factors (access to medical services, sources of food consumed, access to education services, ability to work during COVID-19 restrictions, access to transport, remittances, agricultural services, and exposure to climate shocks such as droughts and floods). Control variables included survey round and region.

Table 3. Logistic Regression Results on Determinants of Severe Household Shocks during COVID-19 in Uganda

Variables	Ref. Cat	Odds Ratio (OR)	95% CI	p-value
Income loss	No income loss	1.25	1.12 – 1.39	0.001*
Job loss	No job loss	1.87	1.61 – 2.16	0.000*
Food insecurity	Food secure	2.10	1.82 – 2.42	0.000*
Social assistance received	No assistance	0.72	0.63 – 0.83	0.000*
Household size	<3 persons	1.09	1.05 – 1.13	0.000*
Age of household head	Less than 25	1.01	1.00 – 1.02	0.056
Sex of household head	Male-headed	1.14	1.01 – 1.28	0.032*
Residence type	Urban	1.31	1.14 – 1.50	0.000*
Education level of head	Primary or below	0.78	0.69 – 0.89	0.001*
Access to medical services	No access	0.84	0.73 – 0.96	0.011*
Sources of food consumed	Purchased	0.76	0.65 – 0.89	0.001*
Access to education services	No access	0.81	0.70 – 0.94	0.006*
Ability so work during COVID	Could not work	0.68	0.58 – 0.79	0.000*
Access to transport	No access	0.79	0.69 – 0.92	0.002*
Access to remittances	No remittances	0.73	0.62 – 0.86	0.000*
Access to agricultural services	No access	0.88	0.75 – 1.02	0.089
Exposure to drought	Not exposed	1.26	1.07 – 1.49	0.005*
Exposure to heavy rains/floods	Not exposed	1.19	1.02 – 1.39	0.024*

***p-value significant at 0.05, Ref. Cat. Reference category.**

The logistic regression analysis results in Table 3, reveals that the severity of household shocks during the COVID-19 pandemic in Uganda was shaped by a combination of economic, demographic, social, and environmental factors. Households that experienced income loss were significantly more likely to report severe shocks, with the odds of severe shocks increasing by 25% compared to households whose income remained stable. This finding

highlights the central role of financial stability in cushioning households from the impacts of crises, as reduced earnings constrain their ability to purchase food, access essential services, and maintain basic consumption levels. Job loss emerged as an even stronger determinant, nearly doubling the likelihood of severe shocks, indicating that labor market disruptions were a critical channel through which the pandemic affected household welfare. Furthermore, food insecurity was the strongest predictor of severe shocks; households that had difficulty obtaining sufficient food were more than twice as likely to experience severe outcomes, demonstrating the tight link between food access and resilience in Ugandan households. Conversely, receipt of social assistance, whether through government or non-governmental programs, reduced the probability of experiencing severe shocks by 28%, illustrating that even limited relief programs provided meaningful protection for vulnerable households.

Demographic characteristics of households also played a significant role in shaping vulnerability. Larger households were more prone to severe shocks, with each additional household member increasing the odds of severe impact by 9%, likely reflecting higher consumption needs and care responsibilities that amplify stress under economic and social constraints. Female-headed households were 14% more likely to experience severe shocks than male-headed households, consistent with the structural gender inequalities that restrict women's access to assets, employment opportunities, and social support. The age of the household head had a marginal effect, suggesting that while older heads may face health-related vulnerabilities, other structural factors such as income sources and household composition exerted stronger influence. Education of the household head was protective, as those with secondary or higher education were 22% less likely to report severe shocks, highlighting the role of human capital in improving decision-making, accessing alternative livelihood options, and navigating social support networks.

The analysis further indicates that rural households were 31% more likely to report severe shocks compared to urban households, reflecting the structural disadvantages of rural areas. Limited access to markets, weaker infrastructure, dependence on subsistence agriculture, and restricted access to social services all contributed to heightened vulnerability in these communities. Access to essential services also mitigated shock severity. Households with reliable access to medical services were less likely to experience severe shocks, demonstrating the importance of healthcare in preventing health-related disruptions from cascading into broader socioeconomic hardships. Similarly, households that maintained access to education

services during school closures were less vulnerable, suggesting that continuity in schooling provided stability and safeguarded human capital investments.

Livelihood opportunities played a critical buffering role during the pandemic. Households able to continue working despite restrictions had 32% lower odds of experiencing severe shocks, indicating that mobility and income-generating capacity were crucial determinants of resilience. Access to transport reduced vulnerability by 21%, likely by facilitating market access, mobility for essential activities, and connectivity to services. Financial safety nets, including remittances, also had a protective effect; households receiving transfers from family members or other sources were 27% less likely to face severe shocks, underscoring the importance of social networks and financial support mechanisms during crises. Reliance on own food production reduced vulnerability by 24% compared to households dependent solely on purchased food, highlighting the resilience benefits of subsistence farming in the context of market disruptions.

Finally, environmental shocks significantly compounded the severity of COVID-19 impacts. Households exposed to drought were 26% more likely to experience severe shocks, while those affected by heavy rains or flooding had a 19% increased likelihood of severe impact. These findings illustrate how climate-related stressors interact with public health crises to create compound risks for households, intensifying the challenges of maintaining food security and livelihood stability. Overall, the results indicate that vulnerability to COVID-19 shocks was multidimensional, with the strongest risk factors including food insecurity, job and income loss, large household size, rural residence, and exposure to climate hazards. Protective factors such as education, access to social assistance, continued work, remittances, and own food production helped reduce the severity of shocks, demonstrating that both structural capacities and targeted interventions are critical for household resilience.

4.4 Coping strategies that were adopted by households during COVID-19

Table 4 reports the various coping strategies adopted by households during COVID-19. The majority of the households in Uganda reportedly relied on savings (28%), 12% received assistance from friends, and 16% reportedly did nothing. The study further reports that 3% of households sold their assets, 7% engaged in additional income-generating activities, 5% borrowed from friends and family, 0.3% took loans from financial institutions, and 1% made credit purchases. It was also reported that 1% of respondents sold their harvests in advance,

10% reduced non-farm consumption, and only 0.6% of households received government assistance.

Table 4. Coping strategies adopted by households during COVID-19

Coping strategy	Frequency (f)	Percentage (%)
Sale of assets	41	3
Engaged in additional income generation	111	7
Received assistance from friends.	178	12
Borrowed from friends and family	79	5
Took a loan from a financial institution	4	0.3
Credited purchases	15	1
Delayed payment obligations	7	0.5
Sold harvest in advance	20	1
Reduced food consumption	181	12
Reduced non-food consumption	141	10
Relied on savings	417	28
Received assistance from government	9	0.6
Did nothing	232	16
Others	57	4
Total	1492	100

4.4.1 Coping strategies adopted by households during COVID-19

From Table 4, the Sale of assets was reported to be a significant coping strategy (p= 0.045) during COVID-19. The majority of the households in Uganda resorted to selling their household assets to cope with the escalating poverty levels, as the majority were not earning during this time period. The study also reported that some households engaged in additional income-generating activities (p=0.003), most of which were small-scale, home-based businesses. Some people reported seeking assistance from friends (p-value=0.000), and others borrowed from friends and family (p=0.003).

Reduced food consumption (p=0.000), relied on savings (p=0.000) were also reported to be significant coping strategies adopted by households during COVID-19. Other households reportedly did nothing (p=0.000). Households that 'did nothing' as a coping response highlight that a significant number of households lacked resources or options to actively mitigate the

impacts of the pandemic whereas coping strategies such as savings, borrowing, selling and engaging in additional income generation provided relief from the shocks.

Table 5. Binary analysis showing the association between dependent and independent variables

Independent Variables	**B**	**(CI)**	***P-value***
Sale of assets	0.564	(-1.11, -0.01)	**0.045***
Engaged in additional income generating activities	0.563	(-0.93, -0.19)	**0.003***
Received assistance from friends	0.713	(-1.03, -0.39)	**0.000***
Borrowed from friends and family	0.645	(-1.07, -0.22)	**0.003***
Took a loan from financial institutions	1.362	(1.13, -3.57)	0.227
Credited purchases	0.200	(0.37, -0.54)	0.596
Delayed payment obligations	1.775	(1.08, -3.89)	0.102
Sold harvest in advance	0.722	(0.42, -1.56)	0.086
Reduced food consumption	0.555	(0.18, 0.30)	**0.000***
Reduced non-food consumption	0.132	(0.14, 0.14)	0.349
Relied on savings	0.787	(0.12, 1.04)	**0.000***
Received assistance from NGOs	24.211	(1.51, 2.91)	1.000
Took advance payment from employer	24.85	(1.48, 2.98)	1.000
Received assistance from government	0.465	(0.48, 0.47)	0.331
Did nothing	-0.586	(0.17, 0.91)	**0.000***

P-value significant at 0.05, %=percentage, CI= Confidence interval

CHAPTER FIVE

DISCUSSION

5.0 Introduction

This chapter presents the discussion of the study results obtained through interpretation, attribution and confirmation with other studies across different scales. The discussion is centred on the main findings of this study and also examines implications for household responses to shocks during COVID-19.

5.1 Shocks that were experienced by households during COVID-19 in Uganda

The study revealed that the death of a household member was one of the most severe shocks experienced by households during COVID-19. Excessive death became a huge topic during the COVID-19 pandemic with over 1.2 million deaths reported in 2019 alone at the onset of the pandemic (Azongo et al., 2025). By the end of 2024, over 7.1 million deaths had been reported, making COVID-19 one of the most deadliest pandemic with exception of the Spanish flu that killed about 40-50 million deaths (Lippi & Sanchis-gomar, 2025). This study Lippi & Sanchis-gomar, (2025) further indicated that despite deaths being prevalent, citing issues related to isolation, barriers to timely medical intervention, and recognition of the post-COVID condition, numbers were less documented. This study was supported by findings by (Riedman et al, 2025)who went further to understand the exact causes of death during the pandemic, and these included hypertensive disease, pneumonia, and other respiratory diseases that were exacerbated by the COVID-19 pandemic.

This study also reported death of someone who sends remittances to be most severe that is by 75% of the respondents. It was reported in studies by Xiao et al., (2025) that in 2020 at the onset of the pandemic, global remittances were set to decline by about 20% and remittance flows by about 23%. This study by (Xiao et al., 2025) further explains that remittances were a key player in eliminating poverty, supporting schooling, medical cares and other needs to the people back home.

Findings from this study also reported Job loss to have been a prevalent shock during the COVID-19 pandemic by 75% of the respondents. During the COVID-19 pandemic millions of people lost their jobs including both employed people and self-employed people (Younger et al., 2020). This was supported by Virtanen et al., (2023) who indicated that job instability

included stable work downsizing, forced reduction in working time and play, becoming unemployed or dismissed among others.

5.2 Factors that influenced household exposure to shocks during COVID-19 in Uganda

5.2.1 Income loss and Job loss

The current study reported that income loss and job loss were strongly associated with increased odds of household vulnerability. These finding are similar to a study (Musoke et al., 2024) who reported that COVID-19 exacerbated decline in small businesses, increased basic food prices, lack of financial support, reduced incomes among others. Similarly, studies by (Moore & Pascal, 2024) who noted that job loss was more prevalent among minority groups and low skilled workers. The study further reports that in the Caribbean, about 31% of the employed lost their jobs during the COVID-19 Pandemic. This could be because, income disruption strained the ability of households to meet essential needs such as food, healthcare and education. Therefore, without stable income, households were forced to adopt negative strategies including food consumption, selling off productive assets or even withdrawing children from school and such actions further deepened vulnerability and compromised long term wellbeing.

5.2.2 Exposure to climatic events

This study also reported exposure to climatic events compounded household vulnerability as one of the key determinants to household vulnerability during COVID-19. Households exposed to drought and heavy rains/floods had significantly higher odds of vulnerability. These findings were also similar to studies by (Ezeh et al., 2021) who reported that extreme events like droughts, floods worsened during COVID-19 since it affected social distancing, personal hygiene, scarcity of water for social distancing among others. This was also in line with the findings of (Thalheimer, 2023; Wright et al., 2024) who reported that climate change also worsened climate mobility and added another complexity to the already existing challenges that were experienced during the pandemic. This could be because climate related impacts overlapped with the pandemic restrictions further limiting households' ability to earn, access markets or even recover from losses.

5.2.3 Household size

The study reported that larger households had higher odds of vulnerability (suggesting that dependency burdens strained coping capacity. A study by (Muir et al., 2023) on 'household

hardships and responses to COVID-19 pandemic-related shocks in Eastern Ethiopia' also reported that households were more likely to report a higher number of hardships if the household had a larger number of household members. This could have been because larger households have more dependents and this increases the dependency ratio. Available resources such as income, food, medical services must hence be shared among more people these are though limited to sustain everyone and therefore making such households more vulnerable to economic and food insecurity shocks.

5.2.4 Sex of household head

Female-headed households were more likely to experience shocks than male-headed households. A study by (Morudu & Kollamparambil, 2020) on health shocks, medical insurance and household vulnerability indicated that female-headed households had greater vulnerability to food shocks. This could be attached to the fact that females are overrepresented in informal sectors, low paying and part-time jobs for example domestic work and during COVID-19, these were the most affected sectors by lockdowns and business closures therefore many women lost income due to movement restrictions and closure of small businesses.

5.2.5 Education level

In terms of education, households headed by individuals with secondary education or higher were significantly less vulnerable These findings were in line with the findings of Muir et al., (2023) who reported that households with low levels of education were more likely to be affected by COVID-19 shocks including loss of jobs, compared to their educated counterparts. This was in line with the findings of (Osabuohien et al., 2024; Wan et al., 2021; Yaddanapudi & Mishra, 2020) who reported that households evidenced significant income reductions during the COVID-19 pandemic and households reported decline in incomes citing to Job loss particularly among the less educated households. This could be because in a country like Uganda, individuals with lower education levels are more likely to work in the informal sector and the COVID-19 restrictions disrupted such activities hence these households faced immediate income losses with limited options for alternative livelihoods compared to their educated counterparts who were engaged in formal/skilled employment and could continue work remotely and were more resilient to the lockdown measures. Higher education levels also enhance the ability to access, understand and act upon public health information, government support programs and new income opportunities and all these are advantages that reduce vulnerability in times of crisis.

5.2.6 Ability to access medical services

Households with reliable access to medical services during the pandemic were less likely to suffer severe socioeconomic shocks. For instance, in Uganda, out-of-pocket health payments during the COVID-19 period pushed many households into financial hardship, reducing their ability to maintain consumption and increasing the risk of catastrophic expenditures (Mpuuga et al., 2025). Likewise, in Kenya, households experiencing asset shocks were significantly less likely to access health care when needed, demonstrating how economic shocks amplify health vulnerabilities in the absence of robust access (Njagi et al., 2021). In Ethiopia, households in lower socioeconomic strata frequently incur catastrophic or impoverishing health expenditures, underlining how limited access to quality health services translates into broader welfare losses (Tadiwos et al., 2025). Together, this body of literature underscores how healthcare access plays a crucial role in buffering households from health-related shocks that might otherwise cascade into deeper economic hardship.

5.2.7 Ability to access education services

Households that maintained access to education services during school closures were less vulnerable to socio-economic shocks hence suggesting that continuity in schooling provided stability and safeguarded human capital investments. This finding suggests that continuity in schooling not only provided a sense of stability for children but also safeguarded long-term human capital investments. According to (Naidu, 2021) disruptions in education during crises such as pandemics or climate-related disasters often exacerbate existing inequalities and threaten future productivity and income generation. Similarly, (Lessons et al., 2022) notes that sustained learning engagement, whether through digital platforms, radio lessons, or community-based learning initiatives, helps households preserve educational gains and maintain psychological and social stability. Therefore, ensuring education continuity during crises is not merely a welfare intervention but a strategic investment in human capital resilience and adaptive capacity.

5.2.8 Ability/inability to work during COVID-19

Households that were able to continue working despite movement restrictions had 32% lower odds of experiencing severe livelihood shocks, underscoring the critical role of mobility and income-generating capacity in building household resilience. A study by (Kesar et al., 2021) indicates that the stoppage of economic activity on account of the lockdown directly translated into a loss of employment and a sharp decline in earnings for a vast proportion of informally

employed. (Barrett & Constas, 2014) emphasize that livelihood continuity enhances adaptive capacity by enabling households to maintain consumption levels, avoid distress asset sales, and invest in recovery efforts. These findings collectively highlight that the ability to work and generate income, even under restrictive conditions, is a fundamental determinant of socio-economic resilience.

5.3 Coping strategies adopted by households during COVID-19 in Uganda

5.3.1 Household Savings

Majority of the households relied on savings (28%) during COVID-19 pandemic in Uganda. A study by (Kansiime et al., 2021) stresses that memberships in savings groups such as savings and credit cooperative organizations (SACCOs), village savings and loans associations (VSLA) and co-save (welfare) was significantly correlated with an 8% reduction in the probability of the income of a respondent being affected by the COVID-19 pandemic. According to (Sharma et al., 2021b) almost 20% of the households relied on savings to address the shocks they faced. This was compared to a study that was conducted in June 2020 at national (including both rural and urban) levels and here 40% relied on savings to cope with shocks. This could have been due to the sudden loss of income and disruption of economic activities. The various lock down measures, curfews and restrictions on movement significantly reduced opportunities for informal work which is the primary source of livelihood for a large proportion of Ugandans. Therefore, with limited or no access to daily income, households resorted to their savings as a coping strategy to meet essential needs such as food, rent, health care among others. Moreover, formal social protection mechanisms in Uganda were relatively underdeveloped, meaning that government support was either insufficient or not widely accessible. In this context, savings within households or through savings groups and cooperatives became an immediate and reliable buffer against the financial shocks triggered by the pandemic. The reliance on savings also highlights the importance of informal community based financial systems which not only encourage saving but also provide social safety during crises.

5.3.2 Receiving assistance from friends

A number of households depended on receiving assistance from friends. A study by (Ntontis et al.,2020) reported that just like the other disasters, mutual aid was also abundant at the onset of the COVID-19 pandemic where more than 4000 mutual aid groups being set up often online on Facebook or WhatsApp and providing those in need with social support. This could have

been because the pandemic raised urgent social and economic needs through sudden lockdowns, income loss and disruptions to formal support systems hence leading households to rely on friends and mutual aid groups which at that time offered trusted, solidarity-driven and rapidly mobilized assistance that was more accessible and less bureaucratically constrained than institutional relief.

5.3.3 Reduced Household food consumption

Households reduced food consumption during the COVID-19 pandemic. These findings are similar to a study by (Eftimov et al., 2020) which reports that the protective measures the governments across the world had implemented restricted people's access to abundant, diverse and nutritious sufficient sources of food and according to FAO, due to the various effects of the global pandemic, the overall global consumption was limited while introducing changes to the global dietary patterns. This same study also concluded that from the perspective of health, it was very positive that the frequencies of salt, fat/oil, sweets and fresh juice/squash had decreased during the quarantine. This could be justified by the fact that homemade dishes contain less salt, fat and sugar than then processed ones (Eftimov et al., 2020). Another study by which was conducted in two major metropolitan areas in the united states to investigate food shopping behaviors and consumption during the pandemic caused by covid19 revealed that by the end of march 2020, additional constraints made shopping in-person unfavorable. Not only was shopping in-store considered high risk, but additional restrictions imposed by retailers themselves or by local mandates made it especially difficult to visit a single store and find it fully stocked. As a result, consumers turned to online services and as the demand for online food purchases surged, fulfillment, and distribution centers were left overwhelmed. Market leaders like Amazon, fulfilled by Whole Foods, were forced to suspend certain services and there was expected to be delivery delays.

5.3.4 Sale of Assets

The study reported sale of assets to be a significant coping strategy during COVID-19. These results a similar to a study by (Austin et al., 2025) which estimates approximately 5% to 7% of the households had to sell productive or household assets, where as 1% had to sell land in order to raise income for survival during the pandemic. The study also based its findings to Kenya and Uganda where female-headed households were reported to less likely use asset selling or taking loans as a coping mechanism than the male headed-households. Rather female-headed households rely more on social networks to cope including family and friends. This could have

been because households needed a coping mechanism to enhance consumption amidst severe shocks such as income losses. People lacked or received limited access to formal aid and credit hence resorting to selling both productive and household assets as a strategy to meet essential needs such as food, rent, and health care among others.

5.3.5 Engaging in additional income generating activities.

Households engaged in additional income generating activities during the pandemic. A study by (Sharma et al., 2021b) revealed that households increased farm-based work and liquidated productive assets to cope with the shocks where more than 40% of the households engaged in additional farm-based activities to cope with shocks. This could have been due to the lockdown restrictions that limited access to non-farm income opportunities, hence households resorting to additional farm-based activities as they could rely on existing sources, secure food, generate income following job losses and draw on farming as a traditional coping strategy during crises.

5.3.6 Did nothing

While many households adopted active coping strategies in response to COVID-19 related shocks, a significant number of respondents reported that they didn't take any specific action to cope with the shocks. A study by (Furbush & Michler, 2021) reported similar results where households adopted a number of coping strategies including living off savings, selling assets, reducing food and non-food consumption, receiving help from family but however, it was striking that many households in Ethiopia, Malawi and Uganda did nothing to cope with an experienced shock. This could have been due to the fact that many households lacked the financial, physical or social resources required to adopt active strategies such as using savings, borrowing or selling assets which hence heightened their vulnerability as the absence of coping mechanisms limited their ability to buffer shocks and as well increasing their exposure to future shocks.

5.4 Research contribution

This study provides new empirical insights into how Ugandan households experienced, responded to, and adapted to multiple shocks during the COVID-19 pandemic within a context of overlapping socio-economic and climatic stressors. It establishes that vulnerability was not only shaped by immediate pandemic-related disruptions such as job and income loss but was also compounded by pre-existing climatic exposures, household size, gender, and education disparities. By integrating health, education, and livelihood dimensions into the analysis, the study demonstrates that access to essential services, particularly healthcare, education

continuity, and the ability to sustain work, significantly buffered households from deeper socio-economic distress. Moreover, the findings reveal the centrality of informal financial systems and social networks as first lines of defense in crisis response, compensating for weak formal safety nets. The study advances new understanding of resilience by highlighting the interconnectedness of pandemic, climate, and structural vulnerabilities, and by evidencing how household-level adaptive strategies, such as reliance on savings, mutual aid, and diversification of income activities, collectively shaped recovery trajectories. These insights contribute fresh empirical knowledge for designing integrated, people-centered resilience and recovery policies in Uganda and similar contexts.

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

6.0 Introduction

This chapter presents the conclusions and recommendations as well as areas for further research based on the findings and discussions as previously presents.

6.1 Conclusions

This study examined the nature and evolution of shocks and stresses experienced by households in Uganda during the COVID-19 period, with a particular focus on the interaction between climatic and non-climatic factors. The findings reveal that household vulnerability during the pandemic was shaped by compound and interacting shocks, rather than by isolated events.

Climatic shocks, especially drought, delayed or irregular rainfall, and crop destruction or failure**,** were widespread and intensified over time. These shocks reflected increasing climate variability and posed significant challenges to agricultural production and food availability. The persistence and escalation of climatic stresses during the COVID-19 period indicate that environmental risks continued to evolve alongside the public health crisis, disproportionately affecting rural and agriculture-dependent households.

At the same time, non-climatic shocks played a critical role in shaping household vulnerability, particularly in the early stages of the pandemic. Widespread income losses, job disruptions, price inflation, and rising costs of agricultural inputs significantly reduced household purchasing power and economic stability. Although some non-climatic shocks, such as employment losses and COVID-19 illness, declined over time, high living costs and input prices remained persistent, constraining recovery and reinforcing economic stress.

Importantly, the study demonstrates that climatic and non-climatic shocks did not occur independently but interacted to compound household vulnerability**.** Climatic stresses reduced food production and availability, while non-climatic shocks simultaneously undermined income and market access. This convergence severely limited households' capacity to cope and recover, particularly among low-income and agriculture-dependent households with limited adaptive capacity, savings, and institutional support.

Household exposure to shocks was further shaped by a complex interplay of socio-economic, institutional, and climatic factors**.** Pre-existing inequalities, limited access to social protection, credit, extension services, and climate information intensified the impacts of both climatic and non-climatic shocks. These findings highlight that vulnerability during COVID-19 was not only a result of the pandemic itself but also of broader structural and systemic constraints.

In response to these shocks, households adopted a range of coping strategies, including selling assets, borrowing, relying on savings, and diversifying income sources**.** While these strategies provided short-term relief, many were erosive in nature, undermining future resilience by depleting assets and increasing indebtedness. The reliance on such coping mechanisms underscores the limited resilience of many households and the need for stronger, more sustainable support systems. Overall, the study underscores the importance of integrated policy responses that address both climate risks and socio-economic vulnerabilities. Strengthening climate resilience, social protection systems, livelihood diversification, and institutional support will be critical in enhancing household capacity to withstand and recover from future compound shocks.

6.2 Recommendations

Based on this study's results and conclusions, the following are the recommendations are provided

1. **Scale up climate-resilient agriculture**
   Government and development partners should strengthen climate-smart agricultural practices, including drought-tolerant crops, improved water management, and climate information services, to reduce household exposure to increasing drought and rainfall variability.
2. **Institutionalize shock-responsive social protection**
   Uganda should expand and institutionalize social protection systems, such as cash transfers, food assistance, and public works to respond rapidly to both climatic and non-climatic shocks during compound crises.
3. **Stabilize food and input markets**
   Targeted market interventions, including improved supply chains, regulation of agricultural input markets, and support for local production, are needed to mitigate food price inflation and rising input costs that exacerbate household vulnerability.

4. **Promote livelihood diversification and financial inclusion**
   Policies should support income diversification, skills development, savings, and access to affordable credit to reduce reliance on asset sales and borrowing as coping strategies during shocks.
5. **Strengthen integrated risk governance and early warning systems**
   Improved coordination among climate, disaster risk management, health, and social protection institutions, supported by integrated early warning systems, will enhance preparedness for future compound climatic and socio-economic shocks.

6.3 Areas for future research

Building on the insights from this study, several areas merit further investigation.

1) Longitudinal studies on household resilience dynamics. Future research should track households over time to understand how coping strategies evolve and whether short-term responses translate into sustained resilience or increased vulnerability.

2) Interlinkages between climate shocks and health crises. More detailed studies are needed to examine how concurrent shocks—such as pandemics and climate extremes, interact to influence livelihoods, health outcomes, and social protection effectiveness in low-income settings.

3) Gendered dimensions of vulnerability and adaptation. Further research should explore how gender roles, household decision-making, and access to resources shape resilience, particularly among female-headed households who were disproportionately affected during COVID-19.

4) Role of informal financial systems and social networks. Since this study identified savings groups and mutual aid as critical buffers, future work could assess how these informal mechanisms can be institutionalized or complemented by formal financial and social protection systems.

REFERENCES

Ahn, S., & Norwood, F. B. (2021). Measuring Food Insecurity during the COVID-19 Pandemic of Spring 2020. *Applied Economic Perspectives and Policy*, *43*(1), 162–168. https://doi.org/10.1002/aepp.13069

Alabi, Q. K. (2023). *Impact of COVID-19 pandemic on mother and child health in Sub-Saharan Africa – a review*. *March*. https://doi.org/10.1038/s41390-023-02651-w

Ambika Sharma, Ariel Gruver, Joao Montalvao, M. O. (2021). *COPING WITH COVID-19 SHOCKS IN WESTERN UGANDA*. *March 2020*.

Amondo, E. I., Kornher, L., Isoto, R., & Bashaasha, B. (2025). *Combined Effects of Weather and Health Shocks on Consumption in Rural Uganda*.

Arabia, L. S., & Version, F. (2020). *The impact of the COVID-19 pandemic on jobs and incomes in G20 economies Table of contents*. *September*, 1–47.

Austin, A., Rahman, I. U., & Rana, Z. (2025). Understanding the ability of households to cope with economic shocks: an empirical study of Pakistan during the COVID-19 pandemic. *Journal of Health, Population and Nutrition*, *44*(1). https://doi.org/10.1186/s41043-025-00772-y

Azongo, D. K., Awine, T., Kabudula, C. W., Oladokun, S., Barr, B. A. T., Bashingwa, J., Ayaga, B., Abu, M., & Ansah, P. A. (2025). *The impact of the COVID - 19 pandemic on all - cause mortality and life expectancy in northern Ghana : findings from the Navrongo Health and Demographic Surveillance System*.

Baena, C., Joarder, T., Ahmed, N. U., & Chowdhury, R. (2023). Aging and the COVID-19 pandemic: The inter-related roles of biology, physical wellbeing, social norms and global health systems. *Maturitas*, *167*(July 2022), 99–104. https://doi.org/10.1016/j.maturitas.2022.07.008

Barrett, C. B., & Constas, M. A. (2014). Toward a theory of resilience for international development applications. *Proceedings of the National Academy of Sciences of the United States of America*, *111*(40), 14625–14630. https://doi.org/10.1073/pnas.1320880111

Beckman, J., Baquedano, F., & Countryman, A. (2023). *The impacts of COVID-19 on GDP , food prices , and food security*. *October*. https://doi.org/10.1093/qopen/qoab005

Ben, T., & El, H. (2024). Heliyon Three years into the pandemic : Insights of the COVID-19 impacts on food security and nutrition in low and middle-income countries. *Heliyon*, *10*(7), e28946. https://doi.org/10.1016/j.heliyon.2024.e28946

Boretti, A. (2022). Covid19 pandemic as a further driver of water scarcity in Africa. *GeoJournal*, *87*(2), 787–814. https://doi.org/10.1007/s10708-020-10280-7

Botzen, W. J. W., Mol, J. M., Robinson, P. J., Zhang, J., & Czajkowski, J. (2022). Individual hurricane evacuation intentions during the COVID-19 pandemic: insights for risk communication and emergency management policies. *Natural Hazards*, *111*(1), 507–522. https://doi.org/10.1007/s11069-021-05064-2

Bwire, G., Ario, A. R., Eyu, P., Ocom, F., Wamala, J. F., Kusi, K. A., Ndeketa, L., Jambo, K. C., Wanyenze, R. K., & Talisuna, A. O. (2022). The COVID-19 pandemic in the African continent. *BMC Medicine*, *20*(1), 1–23. https://doi.org/10.1186/s12916-022-02367-4

Chmielewska, B., Barratt, I., Townsend, R., Kalafat, E., Meulen, J. Van Der, Gurol-urganci, I., Brien, P. O., & Morris, E. (2021). Articles Effects of the COVID-19 pandemic on maternal and perinatal outcomes : a systematic review and meta-analysis. *The Lancet Global Health*, *9*(6), e759–e772. https://doi.org/10.1016/S2214-109X(21)00079-6

Climate Risk Country Profile. (2021). *Climate Risk Country Profile - Uganda*.

Concern Worldwide. (2021). *Coping with Covid-19 : The Impact on the Extreme Poor*. 1–31.

Costella, C., Diez, A., Beazley, R., & Alfonso, M. (2023). *IDB Shock-responsive social protection and climate shocks in Latin America and the Caribbean: Lessons from COVID-19 Inter-American Development Bank Climate Change and Sustainable Development*. *February*.

Crimmins, E. M. (2020). Age-Related Vulnerability to Coronavirus Disease 2019 (COVID-19): Biological, Contextual, and Policy-Related Factors. *Public Policy & Aging Report*, *30*(4), 142–146. https://doi.org/10.1093/ppar/praa023

Crowley, F., & Doran, J. (2020). COVID-19, occupational social distancing and remote working potential: An occupation, sector and regional perspective. *Regional Science Policy and Practice*, *12*(6), 1211–1234. https://doi.org/10.1111/rsp3.12347

Dedewanou, F. A. (2025). *Food Insecurity During the COVID-19 Pandemic in Burkina Faso*. *2020*, 1–22.

Donoghoe, M., Costella, C., & Sivanu, S. (2022). *Climate change , intersecting disasters and social protection : How the COVID-19 experience can prepare us for the future Working paper*. *January*.

Doustmohammadian, A., Fadavi, G., Alibeyk, S., & Saryazdi, M. H. (2023). An overview of food insecurity during the global COVID - 19 outbreak : transformative change and priorities for the Middle East. *Agriculture & Food Security*, 1–18. https://doi.org/10.1186/s40066-023-00448-y

Doyle, A., Hudda, N., & Marzi, M. (2021). *Towards shock-responsive social protection : lessons from the COVID-19 response in Uganda Research report*. *March*.

Duby, Z., Jonas, K., Bunce, B., Bergh, K., Maruping, K., Fowler, C., Reddy, T., Govindasamy, D., & Mathews, C. (2022). Navigating Education in the Context of COVID-19 Lockdowns and School Closures: Challenges and Resilience Among Adolescent Girls and Young Women in South Africa. *Frontiers in Education*, *7*(March), 1–14. https://doi.org/10.3389/feduc.2022.856610

Eftimov, T., Popovski, G., Petković, M., Seljak, B. K., & Kocev, D. (2020). COVID-19 pandemic changes the food consumption patterns. *Trends in Food Science and Technology*, *104*(September), 268–272. https://doi.org/10.1016/j.tifs.2020.08.017

Elayeete, S., Nampeera, R., Nsubuga, E. J., Nansikombi, H. T., Kwesiga, B., Kadobera, D., Amanya, G., Ajambo, M., Mwanje, W., Riolexus, A. A., & Harris, J. R. (2022). Comparative epidemiologic analysis of COVID-19 patients during the first and second waves of COVID-19 in Uganda. *IJID Regions*, *3*(January), 160–167. https://doi.org/10.1016/j.ijregi.2022.03.017

Evangelos Ntontis a,*, Maria Fernandes-Jesus b,c, Guanlan Mao c, Tom Dines d, Jazmin Kane d, Joshua Karakaya d, Rotem Perach c, Chris Cocking e, Michael McTague f, Anna Schwarz g, Joanna Semlyen h, i, J. D. c. (2020). *International Journal of Disaster Risk Reduction*. *January*.

Eyu, P., Elyanu, P., Ario, A. R., Ntono, V., Birungi, D., Rukundo, G., Nanziri, C., Wadunde, I., Migisha, R., Katana, E., Oumo, P., Morukileng, J., & Harris, J. R. (2022). International Journal of Infectious Diseases Investigation of possible preventable causes of COVID-19 deaths in the Kampala Metropolitan Area , Uganda , 2020 – 2021. *International Journal of Infectious Diseases*, *122*, 10–14.

https://doi.org/10.1016/j.ijid.2022.05.033

Ezeh, C. U., Ezeh, J. O., Ekwezuo, C. S., & Ekwezuo, J. C. (2021). The COVID-19 crisis worsens with the occurrence of climate extremes and disasters. *Central European Journal of Geography and Sustainable Development*, *3*(2), 5–16. https://doi.org/10.47246/cejgsd.2021.3.2.1

FAO. (2021). *FOOD AND AGRICULTURE MAKING AGRIFOOD SYSTEMS MORE RESILIENT TO SHOCKS*.

Federica, M., Pattnaik, A., Jordanwood, T., Nakyanzi, A., & Byakika, S. (2020). Uganda's Emergency Response to the COVID -19 Pandemic : A Case Study. *ThinkWell and Ministry of Health Uganda.*, *Washington*(September).

Ford, J. D., Zavaleta-Cortijo, C., Ainembabazi, T., Anza-Ramirez, C., Arotoma-Rojas, I., Bezerra, J., Chicmana-Zapata, V., Galappaththi, E. K., Hangula, M., Kazaana, C., Lwasa, S., Namanya, D., Nkwinti, N., Nuwagira, R., Okware, S., Osipova, M., Pickering, K., Singh, C., Berrang-Ford, L., … Wright, C. (2022). Interactions between climate and COVID-19. *The Lancet Planetary Health*, *6*(10), e825–e833. https://doi.org/10.1016/S2542-5196(22)00174-7

Furbush, A., & Michler, J. D. (2021). *The Evolving Socioeconomic Impacts of COVID-19 in Four African Countries*. *March*.

Gemechu Aga, H. M. (2021). *COVID-19 and African Firms Impact and Coping Strategies*. *April*.

Ghosh, P., & Cartone, A. (2020). A Spatio-temporal analysis of COVID-19 outbreak in Italy. *Regional Science Policy and Practice*, *12*(6), 1047–1062. https://doi.org/10.1111/rsp3.12376

Government of Uganda, Ministry of Lands, H. and U. D. (2006). *THE REPUBLIC OF UGANDA MINISTRY OF LANDS , HOUSING AND URBAN DEVELOPMENT THE NATIONAL LAND USE POLICY*. *June*.

Group, W. B. (2021). *Climate Risk Country Profile - Uganda*.

Gulesci, S., Loiacono, F., Madestam, A., & Stryjan, M. (2020). *SMEs and Workers During Crises : Evidence from the Covid-19 Pandemic in Uganda*. *301*.

International Growth Center. (2020). *Coping with COVID-19 Protecting lives, employment, and incomes in Myanmar*.

Irish Aid. (2017). *UGANDA CLIMATE ACTION REPORT FOR 2016*. https://assets.ireland.ie/documents/UGA-Country-Climate-Action-Reports-Uganda-2015.pdf

James, M. (2022). *Perceptions of COVID-19 threat in Uganda and its impact on household welfare : Evidence from the High-Frequency Phone Survey on COVID-19*.

Jones, N., Sanchez Tapia, I., Baird, S., Guglielmi, S., Oakley, E., Yadete, W. A., Sultan, M., & Pincock, K. (2021). Intersecting barriers to adolescents' educational access during COVID-19: Exploring the role of gender, disability and poverty. *International Journal of Educational Development*, *85*. https://doi.org/10.1016/j.ijedudev.2021.102428

Jummaat, F., Yahya, E. B., Adnan, A. S., & K, A. S. A. (2021). *Impact of COVID-19 on Pregnancy and Maternal Health : An Update PREGNANT WOMEN INFECTED*. *8*(10), 4655–4667.

Jury, M. R. (2024). A Survey of African Weather and Climate Extremes. *Climate*, *12*(5). https://doi.org/10.3390/cli12050065

Kaggwa, R., Nabatanzi, R., Kavuma, S. N., Bakiika, R., & Bainomugisha, A. (2023). Uganda ' s Post-COVID Recovery Strategy & NDC Implementation. *Uganda's Post-COVID Recovery Strategy & NDC Implementation.*

Kansiime, M. K., Tambo, J. A., Mugambi, I., Bundi, M., Kara, A., & Owuor, C. (2021). COVID-19 implications on household income and food security in Kenya and Uganda: Findings from a rapid assessment. *World Development*, *137*, 105199. https://doi.org/10.1016/j.worlddev.2020.105199

Kanyike, A. M., Olum, R., Kajjimu, J., Ojilong, D., Akech, G. M., Nassozi, D. R., Agira, D., Wamala, N. K., Asiimwe, A., & Matovu, D. (2021). *Acceptance of the coronavirus disease- 2019 vaccine among medical students in Uganda*. *1*, 1–11.

Kesar, S., Abraham, R., Lahoti, R., Nath, P., & Basole, A. (2021). Pandemic, informality, and vulnerability: impact of COVID-19 on livelihoods in India. *Canadian Journal of Development Studies*, *42*(1–2), 145–164. https://doi.org/10.1080/02255189.2021.1890003

Koos, C., Hangoma, P., & Maestad, O. (2020). Household wellbeing and coping strategies in Africa during COVID-19: Findings from high frequency phone surveys. In *Chr. Michelsen Institute (CMI) report* (Issue 4).

Kotlar, B., Gerson, E. M., Petrillo, S., Langer, A., & Tiemeier, H. (2023). The impact of the COVID - 19 pandemic on maternal and perinatal health : a scoping review. In *Reproductive Health* (Vol. 18, Issue 1). BioMed Central. https://doi.org/10.1186/s12978-021-01070-6

Krohne, N., Podlogar, T., Gomboc, V., Lavriˇ, M., & Šedivy, N. Z. (2025). *Risk of Job Loss During the COVID-19 Pandemic Predicts Anxiety in Women*. *March 2020*, 1–12.

Kunyanga, C. N., Byskov, M. F., Hyams, K., Mburu, S., Werikhe, G., & Bett, R. (2023). *Influence of COVID - 19 Pandemic on Food Market Prices and Food Supply in Urban Markets in Nairobi , Kenya*.

Lessons, G., Initiatives, F., & Support, T. O. (2022). Peru: Teach for Peru. In *How Learning Continued during the COVID-19 Pandemic*. https://doi.org/10.1787/f5e5e62e-en

Lippi, G., & Sanchis-gomar, F. (2025). *Mortality of Post-COVID-19 Condition : 2025 Update*. *2*, 1–11.

Maccarthy, S., Wagner, Z., Saya, U., Ghai, I., Karamagi, Y., Odiit, M., Mukasa, B., & Linnemayr, S. (2023). Food Insecurity During the COVID - 19 Pandemic : A Longitudinal Mixed - Methods Study from a Cohort of HIV Clients in Uganda. *AIDS and Behavior*, *27*(7), 2216–2225. https://doi.org/10.1007/s10461-022-03953-6

MacDonald, M., & Hill, C. (2022). The educational impact of the Covid-19 rapid response on teachers, students, and families: Insights from British Columbia, Canada. *Prospects*, *51*(4), 627–641. https://doi.org/10.1007/s11125-020-09527-5

Madinah, N. (2020). *The Effect of Covid-19 Pandemic on Economic Growth of Uganda*.

Mahmud, M., & Riley, E. (2023). *Adapting to an aggregate shock : The impact of the Covid-19 crisis on rural households*. 19–36. https://doi.org/10.1007/s11150-022-09625-7

Mattiuzzi, C., & Lippi, G. (2025). *COVID-19 Mortality Trends over the First Five Years of the Pandemic in the US COVID-19 Mortality Trends over the First Five Years of the Pandemic in the US*. *May*. https://doi.org/10.3390/covid5060082

Ministry of Water and Environment. (2021). *INTERGRATED WATER MANAGEMENT AND DEVELOPMENT PROJECT NAMASALE TOWN WATER SUPPLY AND SANITATION SYSTEMS*.

Mo, Y., Wei, D., Chen, X., & Yu, J. (2025). *The burden of COVID-19 death for different cancer types : a large population-based study*. *15*. https://doi.org/10.7189/jogh.15.04046

Modrego, F., Canales, A., & Bahamonde, H. (2020). Employment effects of COVID-19 across Chilean regions: An application of the translog cost function. *Regional Science Policy and Practice*, *12*(6), 1151–1167. https://doi.org/10.1111/rsp3.12337

Moore, W. (2024). The determinants of job losses due to the COVID-19 pandemic in small Island developing states. *Cogent Economics & Finance*, *12*(1). https://doi.org/10.1080/23322039.2024.2316333

Moore, W., & Pascal, S. (2024). The determinants of job losses due to the COVID-19 pandemic in small Island developing states. *Cogent Economics & Finance*, *12*(1). https://doi.org/10.1080/23322039.2024.2316333

Morudu, P., & Kollamparambil, U. (2020). Health shocks, medical insurance and household vulnerability: Evidence from South Africa. *PLoS ONE*, *15*(2), 1–17. https://doi.org/10.1371/journal.pone.0228034

Mpuuga, D., Nakijoba, S., & Yawe, B. L. (2025). Health Expenditure Shocks and Household Poverty Amidst COVID-19 in Uganda: How Catastrophic? *Economies*, *13*(6). https://doi.org/10.3390/economies13060149

Muir, J. A. A., Dheresa, M., Madewell, Z. J. J., Getachew, T., Daraje, G., Mengesha, G., Whitney, C. G. G., Assefa, N., & Cunningham, S. A. A. (2023). Household hardships and responses to COVID-19 pandemic-related shocks in Eastern Ethiopia. *BMC Public Health*, *23*(1), 1–14. https://doi.org/10.1186/s12889-023-16982-0

Mukoki, J., Andabati, D. C., Mukisa, I., Musoke, E., Mukoki, J., Andabati, D. C., Mukisa, I., & Musoke, E. (2024). Female labor force participation under the pandemic : evidence from the 2020 Uganda High- Frequency Phone survey on COVID-19. *Cogent Business & Management*, *11*(1). https://doi.org/10.1080/23311975.2024.2336656

Musoke, D., Deane, K., Nalinya, S., Lubega, G. B., Ekirapa-Kiracho, E., & McCoy, D. (2024). The Unequal Economic and Livelihood Impacts of COVID-19 Lockdowns:

Qualitative Evidence from Uganda. *Inquiry (United States)*, *61*. https://doi.org/10.1177/00469580241284281

Mwiinde, A. M., Siankwilimba, E., Sakala, M., Banda, F., & Michelo, C. (2022). Climatic and Environmental Factors Influencing COVID-19 Transmission—An African Perspective. *Tropical Medicine and Infectious Disease*, *7*(12). https://doi.org/10.3390/tropicalmed7120433

Naidu, S. (2021). Building resilience in education systems post-COVID-19. In *Distance Education* (Vol. 42, Issue 1). https://doi.org/10.1080/01587919.2021.1885092

National Population Council. (2023). *Mindset Change for A Favourable Population Age Structure: A Prerequisite for Wealth Creation NOVEMBER 2023*. *November*.

Naveen Thacker, Leyla Namazove Baranova, J. M. (2020). Child Malnutrition during the Coronavirus disease 2019 pandemic. *Nature Microbiology*, *3*(1), 641.

NEMA. (2016). *the Republic of Uganda Fourth National Report To the Convention on Biological Diversity National Environment Management Authority Ministry of Water and Environment*. *May*.

Ngoma, H., Wen, W., Ojara, M., & Ayugi, B. (2021). Assessing current and future spatiotemporal precipitation variability and trends over Uganda, East Africa, based on CHIRPS and regional climate model datasets. *Meteorology and Atmospheric Physics*, *133*(3), 823–843. https://doi.org/10.1007/s00703-021-00784-3

Njagi, P., Groot, W., & Arsenijevic, J. (2021). Impact of household shocks on access to healthcare services in Kenya: A propensity score matching analysis. *BMJ Open*, *11*(9), 1–10. https://doi.org/10.1136/bmjopen-2020-048189

Okidim, I. A., Egwue, L. O., Ekine, D. I., & Chukuigwe, E. C. (2021). Rural Households' Food Insecurity and Coping Strategies During Covid-19 Pandemic in Enugu State, Nigeria. *Journal of Asian Rural Studies*, *5*(2), 126. https://doi.org/10.20956/jars.v5i2.2778

Ongoma, V., Epule, T. E., Brouziyne, Y., Tanarhte, M., & Chehbouni, A. (2024). COVID-19 response in Africa: impacts and lessons for environmental management and climate change adaptation. *Environment, Development and Sustainability*, *26*(3), 5537–5559. https://doi.org/10.1007/s10668-023-02956-0

Onyeaka, H., Tamasiga, P., Nkoutchou, H., & Guta, A. T. (2022). Food insecurity and outcomes during COVID-19 pandemic in sub-Saharan Africa (SSA). *Agriculture and Food Security*, *11*(1), 1–12. https://doi.org/10.1186/s40066-022-00394-1

Oran, D. P., & Topol, E. J. (2020). Prevalence of asymptomatic SARS-CoV-2 infection. A narrative review. *Annals of Internal Medicine*, *173*(5), 362–368. https://doi.org/10.7326/M20-3012

Orene Greer, Zainab Saeed, Ee Von Woon, Natasha Singh, Mark Johnson, N. S. (2025). *COVID-19 in pregnancy*. 43–56. https://doi.org/10.1111/tog.12960

Osabuohien, E. S., Karakara, A. A. W., & Iddrisu, A. M. (2024). COVID-19 pandemic, household welfare and diversification strategies of smallholder farmers in Uganda. *Discover Sustainability*, *5*(1). https://doi.org/10.1007/s43621-024-00507-9

Palma, J., & Araos, C. (2021). Household Coping Strategies During the COVID-19 Pandemic in Chile. *Frontiers in Sociology*, *6*(August), 1–14. https://doi.org/10.3389/fsoc.2021.728095

Phillips, C. A., Caldas, A., Cleetus, R., Dahl, K. A., Declet-Barreto, J., Licker, R., Merner, L. D., Ortiz-Partida, J. P., Phelan, A. L., Spanger-Siegfried, E., Talati, S., Trisos, C. H., & Carlson, C. J. (2020). Compound climate risks in the COVID-19 pandemic. *Nature Climate Change*, *10*(7), 586–588. https://doi.org/10.1038/s41558-020-0804-2

Porsse, A. A., de Souza, K. B., Carvalho, T. S., & Vale, V. A. (2020). The economic impacts of COVID-19 in Brazil based on an interregional CGE approach. *Regional Science Policy and Practice*, *12*(6), 1105–1121. https://doi.org/10.1111/rsp3.12354

REGINA GARAI ABDULLAH, WONG SWEE KIONG, & NEILSON ILAN MERSAT. (2021). Household Food Security and Coping Strategies During Covid-19 Pandemic. *Jurnal Kinabalu*, *June 2021*, 185–196. https://doi.org/10.51200/ejk.vi.3666

Roy, S., Dutta, R., Ghosh, P., Run, D., & Allen, G. (2021). Social Sciences & Humanities Open Identifying key indicators of job loss trends during COVID-19 and beyond. *Social Sciences & Humanities Open*, *4*(1), 100163. https://doi.org/10.1016/j.ssaho.2021.100163

Sawadogo, N., & Ouoba, Y. (2023a). COVID-19, food coping strategies and households resilience: the case of informal sector in Burkina Faso. *Food Security*, *15*(4), 1041–1056. https://doi.org/10.1007/s12571-023-01371-7

Sawadogo, N., & Ouoba, Y. (2023b). COVID - 19 , food coping strategies and households resilience : the case of informal sector in Burkina Faso. *Food Security*, *0123456789*. https://doi.org/10.1007/s12571-023-01371-7

Schneider, D., Harknett, K., & Gailliot, A. (2024). COVID-19 employment shocks and safety net expansion : Health effects on displaced workers ☆. *Social Science Research*, *124*(August), 103059. https://doi.org/10.1016/j.ssresearch.2024.103059

Sharma, A., Gruver, A., Montalvao, J., & Sullivan, M. O. (2021a). *Coping with COVID-19 shocks in Western Uganda*. *May*, 1–17.

Sharma, A., Gruver, A., Montalvao, J., & Sullivan, M. O. (2021b). *Coping with COVID-19 shocks in Western Uganda Table of Contents*. *May*, 1–17.

Smith, M. D., & Wesselbaum, D. (2020). COVID-19, Food insecurity, and migration. *Journal of Nutrition*, *150*(11), 2855–2858. https://doi.org/10.1093/jn/nxaa270

Ssewanyana, S. (2021). Harnessing the Development Pontential of Household Enterprises in the Covid-19 Environment in Uganda. *Marine Policy*, *14*(1), 86–88. https://doi.org/10.1016/0308-597x(90)90041-o

Sunderland, S. (2024). *Amid adaptations to changes in weather , Ugandans call for collective climate action*. *817*, 1–14.

Syden Mishi , Nomonde Tshabalala, G. A. * and W. M., & Department. (2023). *COVID-19 Experiences and Coping Strategies : The Case of Differently Sized Businesses in South Africa*.

Tabe-Ojong, M. P., Nshakira-Rukundo, E., & Haile Gebrekidan, B. (2023). COVID-19 and food insecurity in Africa: A review of the emerging empirical evidence. *European Review of Agricultural Economics*, *50*(3), 853–878. https://doi.org/10.1093/erae/jbad008

Tadesse, S., & Muluye, W. (2020). The Impact of COVID-19 Pandemic on Education System in Developing Countries: A Review. *Open Journal of Social Sciences*, *08*(10), 159–170. https://doi.org/10.4236/jss.2020.810011

Tadiwos, Y. B., Kassahun, M. M., & Mebratie, A. D. (2025). Catastrophic and impoverishing out-of-pocket health expenditure in Ethiopia: evidence from the Ethiopia socioeconomic survey. *Health Economics Review*, *15*(1), 1–13. https://doi.org/10.1186/s13561-025-00602-1

Thalheimer, L. (2023). Compound impacts of extreme weather events and COVID-19 on climate mobilities. *Area*, *55*(1), 134–141. https://doi.org/10.1111/area.12821

Twinomuhangi, R., Sseviiri, H., Kato, A. M., & Kato, A. M. (2023). *Contextualising environmental and climate change migration in Uganda*. https://doi.org/10.1080/13549839.2023.2165641

UN. (2020). From the covid-19 response to recovery and resilience-building analyses of the socioeconomic impact of covid-19 in uganda. *United Nations*, *June*.

US Mission. (2019). *Uganda Country Handbook*. *11*(1), 1–14.

Uwe Riedman, Micheal Levitt, Stefan Pilz, J. P. L. (2025). *Post-pandemic mortality patterns and COVID-19 burden considering multiple death causes*. 0–3.

Virtanen, M., Lamontagne, A. D., Blomqvist, S., Robin, S. H., & Hanson, L. L. M. (2023). *SSM - Population Health Job loss and job instability during the COVID-19 pandemic and the risk of depression and anxiety among Swedish employees ¨gn a*. *22*(February). https://doi.org/10.1016/j.ssmph.2023.101424

Walton, D., Arrighi, J., Aalst, M. Van, & Claudet, M. (2021). *The compound impact of extreme weather events and COVID-19* (Issue September).

Walton, D., & Van Aalst, M. (2020). *Climate-related extreme weather events and COVID-19 A first look at the number of people affected by intersecting disasters*. *September*, 34.

Wan, X., Huang, H., Shang, J., Xie, Z., Jia, R., Lu, G., & Chen, C. (2021). Willingness and influential factors of parents of 3-6-year-old children to vaccinate their children with the COVID-19 vaccine in China. *Human Vaccines and Immunotherapeutics*, *17*(11), 3969–3974. https://doi.org/10.1080/21645515.2021.1955606

West, D., Umali, S., Sharma, S., Wu, L., Adjoyan, C., Cox, H., & Majumdar, S. (2021). *Mortality during the COVID-19 Pandemic in Australia*.

World Food Programme. (2023). *The Lingering Impacts of COVID-19 on Food Security and Livelihoods across the Eastern Africa Region Ma y 2023*.

World Health Organization. (2025). *COVID-19 Epidemiological Update*. *March*.

Wright, C. Y., Kapwata, T., Naidoo, N., Asante, K. P., Arku, R. E., Cissé, G., Simane, B., Atuyambe, L., & Berhane, K. (2024). Climate Change and Human Health in Africa in

Relation to Opportunities to Strengthen Mitigating Potential and Adaptive Capacity: Strategies to Inform an African “Brains Trust.” *Annals of Global Health*, *90*(1), 1–21. https://doi.org/10.5334/aogh.4260

Xiao, G., Amamoo-otoo, C., Chi, X., & Adjei-tetteh, I. (2025). *Analyzing the Impact of COVID-19 on Remittances : A Case Study of Ghana*. *13*(3), 2276–2286. https://doi.org/10.4236/ojbm.2025.133117

Yaddanapudi, R., & Mishra, A. K. (2020). *Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID- 19 . The COVID-19 resource centre is hosted on Elsevier Connect , the company ’ s public news and information . January*.

Younger, S. D., Ntungire, N., Younger, S. D., Musisi, A., Asiimwe, W., Ntungire, N., & Rauschendorfer, J. (2020). *Estimating income losses and consequences of the COVID-19 crisis in Uganda Estimating Income Losses and Consequences of the COVID-19 Crisis in Uganda*. *November*.

Yu, X., Duan, J., Jiang, Y., & Zhang, H. (2020). Distinctive trajectories of the COVID-19 epidemic by age and gender: A retrospective modeling of the epidemic in South Korea. *International Journal of Infectious Diseases*, *98*, 200–205. https://doi.org/10.1016/j.ijid.2020.06.101