IMPACT OF AGRIBUSINESS EMPOWERMENT INTERVENTIONS ON SKILLS DEVELOPMENT AND LIVELIHOOD OUTCOMES: EVIDENCE FROM THE ENABLE PROGRAMME IN AFRICA

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DECLARATION AND APPROVAL

Declaration

This thesis is my original work and has not been presented for an award in any other university.

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DEDICATION

This thesis is dedicated to God almighty, the author and finisher of my faith and the giver of wisdom and understanding. To my family, whose unwavering support saw me through many challenges on this journey, and to my wonderful husband, who brightened up my world with his positivity.

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LIST OF ABBREVIATIONS

ABC – Agro-Business Creation

AGRA – Alliance for a Green Revolution in Africa

AfDB – African Development Bank

ATA – Agricultural Transformation Agenda

ATE – Average Treatment Effect

ATT – Average Treatment Effects on the Treated

ATU – Average Treatment Effects on the Untreated

ANOVA – Analysis of Variance

CAADP – Comprehensive African Agriculture Development Programme

CAP – Common Agricultural Policy

CLARIS – Community Livelihood and Rural Industry Support

DRC – Democratic Republic of Congo

ECA – United Nations Economic Commission for Africa

EPR – Employment to Population Ratio

ENABLE – Empowering Novel Agribusiness-Led Employment

ESR – Endogenous Switching Regression

ESTER – Endogenous Switching Treatment Effect Regression

ETER – Endogenous Treatment Effect Regression

FAO – Food and Agriculture Organization of the United Nations

FCS – Food Consumption Score

FIML – Full Information Maximum Likelihood

FMARD – Federal Ministry of Agriculture and Rural Development

GAFSP – Global Agriculture and Food Security Programme

GDP – Gross Domestic Product

GUYS – Graduate Unemployed Youth and Women Support

HFIAS – Household Food Insecurity Access Scale

IFAD – International Fund for Agricultural Development

IID – Independently and Identically Distributed

IITA – International Institute of Tropical Agriculture

ILO – International Labour Office

IMR – Inverse Mills Ratio

IRP – Innovation for Rural Prosperity

KYAS – Kenya Youth Agribusiness Strategy

KYEP – Kenyan Youth Empowerment Programme

KyD – Kaonafatsw ya Dikgomo

LGAs – Local Government Areas

LIFE – Livelihood Improvement Family Enterprise

LPM – Linear Probability Model

MAIH – Mali Agribusiness Incubation Hub

NEPAD – New Partnership for Africa's Development

NCPD – National Council for Population and Development

NDE – National Directorate of Employment

NOAS – National Open Apprenticeship Scheme

ODK – Open Data Kit

OLS – Ordinary Least Squares

SDGs – Sustainable Development Goals

SMEDAN – Small and Medium Enterprise Development Association of Nigeria

SURE-P – Subsidy Reinvestment and Empowerment Programme

STEP – Skills Toward Employment and Productivity

TBIF – Technology and Business Incubation Facility

TH – Transitional Heterogeneity

VC – Value Chain

VIF – Variance Inflation Factor

YA – Youth Agripreneurs

YAS – Young Agripreneurship Survey

YCAD – Youth Commercial Agriculture Development Programme

YEAP – Youth Employment in Agriculture Programme

YEEP – Youth Evergreen Entrepreneurship Programme

YISA – Youth Initiatives for Sustainable Agriculture

YIYA – Youth Inspiring Youth in Agriculture

YOU-WIN – Youth Enterprise With Innovation in Nigeria

GENERAL ABSTRACT

Agribusiness empowerment programmes have become a common strategy to promote youth agripreneurship, help young people develop relevant skills, improve the performance of youth-led agribusiness enterprises, and invariably reduce youth unemployment in Africa. The relevance of these programmes is reflected in many employment frameworks of African government and development partners towards achieving the Sustainable Development Goal (SDG) 8 on decent work and economic growth and SDG 2 on zero hunger through increased youth engagement in the agricultural sector. However, while the rapid evolution and importance of these programmes to host countries are documented, their impacts on both livelihood and economic outcomes remain poorly understood both at national and regional levels. Without sufficient empirical evidence, policymakers and development partners involved in programme implementation may be caught between making informed decisions about scaling programmes or truncating them altogether.

This study investigates the factors that drive youth participation in agribusiness empowerment interventions and evaluates programme's impact on their agripreneurship skills, job creation capacity, and livelihood outcomes taking evidence from the youth component of the African Development Bank (AfDB) Technologies of African Agricultural Transformation (TAAT), Empowering Novel Agribusiness-Led Employment (ENABLE) programme conducted in Kenya, Nigeria, and Uganda. A multistage sampling technique was used in obtaining primary agribusiness-level data from a sample of 1435 young agripreneurs, comprising 737 participants and 698 non-participants across the study countries. Descriptive statistics disaggregated by treatment status were generated to assess the food security status of the respondents, the differences in key covariates, and the estimated impact of programme participation. A logistic

regression model was used to assess the factors influencing food security and programme participation; an Endogenous Treatment Effect Regression (ETER) model was used to assess the programme's impact on livelihood outcomes; and an Endogenous Switching Regression (ESR) model was used to estimate the impact on agripreneurship skills and job creation capacity. The results indicate low dietary diversity across the three countries. Also, the majority of the respondents had unacceptable food consumption scores, suggesting that despite being food producers, some young agripreneurs are still food insecure. Food security was positively correlated with access to extension services, participation in the ENABLE-TAAT programme, and access to market information but, negatively with access to credit, number of employees, Covid-19 pandemic, and location. Age, years of formal education, marital status, household size, the value of durable assets, agripreneurship experience, business level, credit access, and training perceptions were significantly correlated with programme participation. Even though both participants and non-participants had relatively high agripreneurship skills scores, participants had higher scores than non-participants across the three countries. The impact estimates from the switching regression model also show that participation had significant and positive impacts on agripreneurship skills, job creation capacity, income, and food security. Similar results were obtained across the three countries for agripreneurship skills and job creation capacity. However, no significant impact was found for income and food security in Kenya and Nigeria, respectively which was attributed to specific contextual factors. These results suggest the need for more investment in policy interventions or programmes focusing on youth agribusiness empowerment, particularly those that target young actors along different agricultural value chains. It also suggests interventions geared towards mitigating constraints to credit access by young agripreneurs to ease barriers to working capital and business

innovation. Furthermore, the study recommends strategies to improve youth perception and raise awareness of programmes to increase participation.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Youth bulge, unemployment, and underemployment are prevalent phenomena in Africa. According to the United Nations (2022), about 70 percent of the African population is below 30 years old, reflecting a serious issue of youth bulge which is likely to double by 2050 (Mastercard Foundation, 2018). While some scholars consider this as an economic asset (Morsy & Mukasa, 2019), others have analogized it as a ticking time bomb that poses a huge challenge for young people to find decent and sustainable jobs, while also compounding national and economic challenges (Ahmed, 2014; Muchemwa, 2019; NCPD, 2017).

According to the International Labour Office (ILO) (2020), between 1999 and 2019, Africa's youth unemployment rate increased by about 9 percent, while the Youth Employment to Population Ratio (EPR) decreased by over 23 percent. The EPR, which is currently about 1.8 times lower than that of adults (aged 36 and above), is expected to fall by 0.1 percent by 2023 as a result of continued declines in labour force participation due to limited employment opportunities in the formal sector. According to the same report, young people are three times less likely than adults to secure long-term employment, with labour informality being the norm. Specifically, less than one-fourth of Africa's 12 million youths of working age are absorbed into the labour market each year, leaving many unemployed (AfDB, 2016). This employment disparity, according to the Independent Evaluation Group of the World Bank, is attributed to certain labour demand and supply factors coupled with constraints in the credit markets which hinder smooth school-to-work transition.

Notably, graduate youth unemployment and underemployment are pronounced and severe in Africa (Chigbu & Nekhwevha, 2021; Chitema, 2020), due to limited opportunities for self-

development and employment opportunities in the formal sector (IFAD, 2019). For instance, Nigerian and Kenyan tertiary institutions release an average of 500,000 graduates to the labour market annually, but less than 50 percent can secure sustainable employment (Hall, 2017; Kazeem, 2016). Similarly, the average graduate youth unemployment rate in Uganda is about 13 percent, making it one of the highest in the World (Uganda Bureau of Statistics, 2018). This low labour market absorption rate has left over 33 percent of the approximately 420 million youth in the continent discouraged and jobless, about one-third vulnerably employed, and less than one-third in wage employment (AfDB, 2016). Both unemployment and underemployment affect the well-being of young people and, more broadly, the stability and socio-economic development of their immediate communities (FAO & ECA, 2018). The World Bank (2011) reported that more than two-fifths of youths who join rebel groups do so because they cannot find decent work or other ways to earn money.

These ongoing issues have led to a growing demand for urgent policy- and programme-level interventions to curb youth unemployment and underemployment, as well as their accordant undesirable outcomes, particularly among young graduates. In response, African leaders and development partners have made concerted efforts, most of which are focused on promoting a shift from conventional formal job creation towards entrepreneurship, with a deliberate focus on agriculture. The central vision is for young people to engage in different agricultural value chains to enjoy the financial and livelihood gains of commercialization in a globalized world (Asciutti *et al*., 2016). Also, this recent focus on agriculture is based on the sector's potential to generate sustainable employment for a large number of youths (Yami *et al.,* 2019). For instance, the World Bank data on employment rates by sector released in 2021 ranked agriculture as Africa's most important source of employment, accounting for nearly 52 percent

of the total labour force[1]. Aside from employment generation which is closely linked to SDG 8 on decent work and economic development, a strong connection exists between youth engagement in agriculture and Africa's ability to achieve its food security and nutrition goals as well as SDG 2 on zero hunger (Izuchukwwu, 2019; Judith, 2014; Mekonnen, 2017). According to Wittman *et al*. (2021), youth engagement and employment in sustainable food systems are simultaneously a means for the radical transformation of the systems, the achievement of SDGs, and economies of well-being.

With the recognition of this high gainful employment prospects in the agricultural value chain (Adeyanju *et al*., 2021; Ogunmodede *et al*., 2020; Yami *et al*., 2019), the African government and development partners have shown their commitment to empowering young people in agripreneurship. These commitments are reflected in the growing investment in agricultural programmes and interventions aimed at harnessing youth interest in agribusiness careers and promoting self-employment through agripreneurship (Adeyanju *et al*., 2020; Ogunmodede *et al*., 2020; Yami *et al*., 2019). Examples include country-specific programmes such as the Kenya Youth Agribusiness Strategy (KYAS), the Fadama Graduate Unemployed Youths and Women Support (GUYS) programme in Nigeria, and the Youth Empowerment through Agriculture (YETA) programme in Uganda and regional programmes including the Comprehensive African Agriculture Development Programme (CAADP), the IITA[2] Youth Agripreneurs (IYA) programme, and the youth component of the Technologies of African Agricultural Transformation called Empowering Novel Agri-Business Led Employment (ENABLE-TAAT) programme whose sole activity was to train and support youth graduates in

[1] https://data.worldbank.org/indicator/SL.AGR.EMPL.ZS?locations=ZG
[2] IITA for International Institute of Tropical Agriculture

agripreneurship**.** The common objectives of these programmes are to reduce youth unemployment, ensure they are economically empowered, and through their engagement in agriculture, increase agricultural productivity to help in eradicating hunger (SDG 2) and poverty in Africa.

Even though a few studies have assessed the employment impact of some of these programmes for unemployed youths (Adeyanju *et al.*, 2021; Gar & Rodgers, 2020; Yamta & Midala, 2014), only a few have focused on unemployed graduates as they are perceived to prefer formal employment compared to their counterparts with no formal education. These studies also focused on the direct jobs created from programmes, rather than assessing the job creation capacity of the participants. Globally, an overview of evidence from the few existing studies also seems to have divergent views on the relationship between empowerment programmes and economic outcomes including income and employment (Fox & Kaul, 2018; Gautam *et al*., 2017; Kluve *et al*., 2017, 2019), due to the heterogeneous nature of programmes, sample size, methods adopted, and the conditions under which studies are implemented.

Also, many studies have not focused on agribusiness empowerment programmes (Fox & Kaul, 2018; Gautam *et al*., 2017; Kluve *et al*., 2017, 2019), thereby limiting the extent to which they can inform discussions on youth agripreneurship. Besides, studies on the food security status of young people are very rare since the primary focus is usually on the household (Awoke et al., 2022; Aidoo *et al*., 2013; Iftikhar & Mahmood, 2017; Matchaya & Chilonda, 2012). Regionally, the few existing studies seem to focus on the determinants of participation in empowerment programmes rather than assessing their impacts on livelihood and economic outcomes (Adeyanju *et al*., 2019; Addo, 2018; Nwibo *et al*., 2016). Furthermore, most existing studies are not sector-specific and tend to generalize entrepreneurship which is not likely to

drive practical policies in the field of agribusiness (Chigunta, 2017; McKenzie & Woodruff, 2014; Mohamed & AliShiekh, 2017; Saripah *et al*., 2020).

1.2 Statement of the Research Problem

Agricultural entrepreneurship is receiving a lot of attention as a feasible alternative to conventional and declining formal employment in Africa. With a depleting economy that can't keep up with the rising rate of youth unemployment, combined with a steady increase in the number of university graduates, put at 12 million annually[3], development stakeholders and different African governments including the government of Kenya, Nigeria, and Uganda have developed and implemented several strategies and initiatives to promote agripreneurship among young people. Notably, agribusiness empowerment programmes have become one of the common strategies to crop youth into agripreneurship and improve the performance of youth-led agribusiness enterprises.

However, while these efforts have been ongoing for over a decade, there is a lack of adequate evidence on what succeeded or did not. Even though the significance and developmental implications of some of these efforts have been discussed in literature (Akrong et al., 2020; Ninson & Brobbey, 2023; Yami et al., 2019), their impacts remain poorly understood, both at national and regional levels with limited practical evidence of their contribution to youth agripreneurship skills, job creation capacity, and livelihoods. This presents a challenge in developing evidence-based policies on youth agripreneurship and strategies for profitable investments in youth.

[3] https://www.afdb.org/en/news-and-events/press-releases/african-economic-outlook-2020-africas-economy-forecast-grow-despite-external-shocks-33839

Additionally, the few existing empirical evaluations focused on the impact of agricultural/technical skills while evidence on the impact of programmes that combine agricultural and entrepreneurial skills is limited, particularly in developing countries. An exemption is Alcid et al. (2022) who assessed the short and medium-term impacts of an employability intervention in Rwanda. Without sufficient practical evidence, policymakers and development partners involved in programme implementation may be caught between making informed decisions about scaling programmes or truncating them altogether.

It is also worth noting that the few studies that have been conducted on the subject are country-specific and a comparativeness of what works in different countries coupled with the determining factors is lacking. Thus, from an economic and cultural perspective, it is cognitively beneficial to have a reference point in data from different countries in which agribusiness programmes are being implemented as this will contribute to obtaining more adequate and in-depth judgments on their impacts. This study, therefore, addressed some of the identified research gaps, particularly those that relate to economic and livelihood outcomes to provide a feasible direction for properly designing agribusiness programmes to yield better outcomes for youths.

Unlike studies that aggregated their analysis on youth entrepreneurship, this study focused on agripreneurship and conducted a country-disaggregated analysis to assess similarities and differences across three countries (Kenya, Nigeria, and Uganda) in which agribusiness empowerment interventions have been most successful. Furthermore, in this context of ongoing strategies and efforts to improve youth livelihoods through agripreneurship, the study assessed the food security status of individual youth rather than that of the household to ensure

that their food security is also being addressed, given that they face tougher food security challenges than adults.

1.3 Purpose and Objectives of the Study

This study assessed the impact of agribusiness empowerment programmes on skill development, job creation capacity, and livelihood outcomes among young African agripreneurs, taking evidence from the ENABLE-TAAT programme in Kenya, Nigeria, and Uganda.

The specific objectives of the study were to:

i. Assess the food security status of young agripreneurs in the study areas
ii. Assess the determinants of youth participation in the Programme.
iii. Assess the impact of Programme participation on youth agripreneurship skills.
iv. Evaluate the impact of Programme participation on young agripreneurs' job creation capacity.
v. Evaluate the impact of Programme participation on young agripreneurs' livelihood outcomes (income and food security status).

1.4 Research Hypotheses

The following hypotheses were tested:

1. Young agripreneurs are not food secure.
2. Socioeconomic, demographic, and institutional factors have no significant influence on youth participation in the Programme.
3. Participation in the Programme has no significant impact on youth agripreneurship skills.

4. Participation in the Programme has no significant impact on young agripreneurs' job creation capacity.
5. Participation in the Programme has no significant impact on young agripreneurs' livelihood outcomes.

1.5 Significance of the Study

The relevance of this study is reflected in the Step for the Skills Toward Employment and Productivity (STEP) framework of the World Bank and other alternative employment frameworks of African governments and other development partners, including the International Institute of Tropical Agriculture (IITA) and African Development Bank (AfDB). It builds upon existing multi-sector efforts that examine the promotion of agripreneurship, including but not limited to agribusiness training.

The results of this study have several social and economic change implications for development partners, policymakers, researchers, and young agripreneurs. For government and development partners, identifying the determinants of food security and programme participation can provide insights into designing policies that address food insecurity among youths as well as help in developing, formulating, and implementing agribusiness programmes that promote agripreneurship among youth. For researchers, the results offer a new path to advance inquiry into youth agribusiness empowerment programmes in Africa and extend the body of literature on how programmes can be better designed and implemented to generate sustainable employment and better outcomes for young people.

Also, evidence of the programme's impacts on skills development, income, and food security can help young people make informed decisions on whether to engage in agripreneurship or

not and recommend ways through which young agripreneurs can sustain their agribusiness ventures over time. This information is also highly relevant for policymakers and programme implementers in making informed investment decisions on whether to scale or truncate programmes. From a social change perspective, it sheds more light on the importance of youth empowerment programmes in developing countries. In relation to SDG 8 on decent work and economic growth, one of the fundamental principles adopted is to support productive activities, decent job creation, and entrepreneurship among young people. Thus, documenting the impact of the programme on agripreneurship skills, income, job creation, and other livelihood outcomes is pertinent to making sound policies that will contribute to the achievement of this goal. This evidence could also offer a new paradigm for harnessing the agripreneurship mindset of young people.

As the largest category of the population, young people are critical to agricultural transformation. Thus, knowing the impact of interventions aimed at empowering youth in agripreneurship has two important implications for achieving food security in Africa. Firstly, increased consciousness of the benefits of these interventions may lead to an influx of young people into the agricultural sector, thereby solving the challenge of the ageing farming population. Also, this will help to reduce the soaring youth unemployment rates in Africa and boost agricultural production. Secondly, increased food production can contribute to food security and nutrition, and subsequently help in achieving SDG 2 on zero hunger.

1.6 Organization of the Study

Following this introductory chapter, the rest of the thesis is organized as follows. The second chapter provides an extensive empirical and theoretical review of relevant literature which guides the study. Also, definitions of important terms relevant to the study and the theoretical

framework are presented in this chapter. The general methodology capturing the conceptual framework, contextual description of the study areas, research design, data collection and analysis methods are presented in chapter three. Chapter four addresses the first objective of the thesis and presents the first paper entitled '*Assessing Food Security among Young Farmers in Africa: Evidence from Kenya, Nigeria, and Uganda.'* The results of the second objective and the second paper entitled '*African Youth Engagement in Agribusiness and Related Programmes: Determinants and Implications for Future Programmes'* is presented in chapter five. Chapter six documents the third objective and presents the third paper entitled '*Can young agripreneurs improve their skills through agripreneurship empowerment programmes? Evidence from Africa*'. Chapter Seven presents the fourth paper entitled '*Harnessing the Job Creation Potential of Young Rural Agripreneurs: A Quasi-experimental Study of the ENABLE Programme in Africa,'* which addresses the fourth objective. The fifth paper on the '*Impact of Agribusiness Empowerment Interventions on Youth Livelihoods: Insights from Africa'* which addresses the fifth objective is presented in chapter eight. The concluding chapter presents the general conclusions and recommendations.

CHAPTER TWO

LITERATURE REVIEW

2.1 Definition of Terms

2.1.1 Youth

Within the context of this study, Youth are classified as all young males and females between 18 and 35 years of age (International Labour Organization (ILO), 2005). This definition is consistent with the one proposed by the Nigeria Youth Policy Document (2009). Even though the definition appears broad, it is justified by the fact that most young people go through significant changes and different life circumstances as they prepare to enter adulthood at this time. The case study is consistent with the same document's assertion that individuals in this age group require political, economic, and social support to reach their full potential.

2.1.2 Agripreneurship

While entrepreneurship broadly entails starting, growing, and running a new business venture in any sector, agripreneurship is sector-specific, describing a gainful linkage between entrepreneurship and agriculture (Bairwa *et al*., 2014). Following Mukembo (2017), agripreneurship is defined as "the application of entrepreneurial principles to identify, develop, and optimally manage viable agricultural ventures for profit and/or improved livelihoods. This definition was adopted because it broadens the concept of agripreneurship beyond the transformation of a farm into a business to capture other entrepreneurial outcomes in the agricultural sector.

2.1.3 Entrepreneurs

In this study, Entrepreneurs are classified as people who share distinct characteristics such as single-mindedness, ambition, drive, creativity, problem-solving, practicality, and goal-orientedness for the sole purpose of identifying and filling market gaps (Bairwa *et al*., 2014).

2.1.4 Agribusiness

Agribusiness refers to all businesses and services within the agricultural supply chain, from agricultural production to processing to wholesale and retailing, that can lead to job creation and financial gain.

2.1.5 Food Security

Food security as a concept has evolved over the years with several definitions. The Food and Agriculture Organization of the United Nations (FAO) (2012) posits that food security exists when "all people have physical, social and economic access to sufficient, safe and nutritious food which meets their dietary needs and food preferences for an active and healthy life at all times." Within the context of this study, food security entails young people having access to safe, sufficient and nutritious meals at all times. This definition integrates nutritional balance and food safety and reflects concerns about food composition and other nutrient requirements for a healthy life (Raheem, 2018). An important aspect that is highly relevant to this study is the emphasis on "all people and at all times," which underscores the need for indicators that can be disaggregated to specific groups such as youth.

2.2 Youth-Driven Agricultural Empowerment Programmes in Africa

The recognition of the employment potentials embedded in the agricultural sector coupled with the patent uncertainties surrounding youth unemployment has led to an upsurge in the number of youth-focused agricultural empowerment programmes in Africa over the last decades

(Adeyanju *et al*., 2020). At the regional level, some commitments mandate national governments to generate and expand agricultural employment opportunities for youth. For example, the Comprehensive African Agriculture Development Programme (CAADP) was adopted in 2002 to promote interventions that support African agriculture (New Partnership for Africa's Development (NEPAD) & FAO, 2003). In addition, the 'African Union Malabo Declaration on Accelerated Agricultural Growth and Transformation for Shared Prosperity and Improved Livelihoods' adopted in 2014, requires member countries to employ at least 30 percent of youth in agricultural value chains (FAO, 2018).

At the national level, several agricultural programmes have been implemented to harness the innovative potentials of young people and help them to benefit from emerging opportunities in the agricultural value chains. The potential benefits of these commitments and programmes have been widely discussed in literature (Adeyanju *et al.,* 2021; Akrong & Kotu, 2022; Bairwa *et al*., 2014; FAO, 2018; Magagula & Tsvakirai, 2020; Moore, 2015; Ogunmodede *et al.*, 2021; Ouko *et al*., 2022; Yami *et al*., 2019). However, there are very limited studies on the extent to which these programmes were able to reduce the rate of unemployment and yield favourable economic outcomes for their beneficiaries (Yami *et al*., 2019) which shows the relevance of the current study.

2.2.1 The Fadama Graduate Unemployed Youth and Women Support (GUYS) Programme (Nigeria)

The Fadama GUYS Programme is a youth-focused intervention by the Federal Government of Nigeria, the World Bank, and all participating state governments. The programme was jointly implemented with the Federal Ministry of Agriculture and Rural Development (FMARD) and tertiary universities across 23 states in Nigeria. It focused on helping young graduates between

the ages of 18 – 35 years to develop and manage relevant technical, entrepreneurial and other specialised skills in the field of agribusiness. The training lasted for about four weeks, after which small grants and post-training mentorship were provided to the participants. The primary goal was to expose unemployed young graduates to innovative agribusiness ideas which could, in turn, assist them in channelling their energy and motivation toward bolstering national and economic diversification (Adeyanju *et al*., 2020).

2.2.2 The Livelihood Improvement Family Enterprise (LIFE) Programme (Nigeria)

The LIFE programme is one of the initiatives launched by Nigeria's Federal Ministry of Agriculture and Rural Development to address the lack of job opportunities for young people and women in rural and suburban areas in order to improve their economic standing and enable them to lead respectable lives (FMARD, 2016). Overall, the programme aims to promote economic growth and food security through job creation, agribusiness development, and promotion of value addition. To achieve this, community-based on/off-farm agribusiness activities along key different agricultural value chains were strongly encouraged (FMARD, 2016).

For its implementation, a cluster model was adopted at the Local Government Areas (LGAs) level with an emphasis on primary goods with competitive advantages in the target communities. Participants in each cluster were trained and supported in different areas of the agriculture value chain. The programme facilitates access to affordable inputs, agro-processing and packaging, transportation, finance and markets (FMARD, 2016)**.**

2.2.3 Agro-Business Creation (ABC) Programme (Sudan)

Funded by the Dutch Ministry of Foreign Affairs, the ABC programme was implemented by SPARK in collaboration with local partners between 2013 and 2017 to promote youth agripreneurship and job creation along the agricultural Value Chains (VC). The major goal was to contribute to stability and food security in Sudan (Lenfant, 2017). The programme adopted a three-way strategy, which includes training, mentorship, and technical support on how to prepare business plans. Besides, financial assistance was provided to the beneficiaries in form of soft business loans from financial institutions. The training focused on improving the technical, entrepreneurial, and business capacities of the youths.

A notable strength of the programme is the adoption of three mutually reinforcing strategies which involve simultaneously strengthening the capacities of individual agripreneurs, agripreneurs' associations, and cooperative societies to aid skills acquisition and enterprise creation, and strengthening VCs through multi-stakeholder partnership which eased government legitimacy (Lenfant, 2017). At inception, market fluctuations from political instability and insufficient value chain linkages posed a major challenge. However, the programme was able to identify and strengthen two important value chains (horticulture and cereal) of competitive advantage. While these chains were strengthened, no evidence shows the income impacts of the programme (Lenfant, 2017).

2.2.4 Kenya Youth Agribusiness Strategy (KYAS)

KYAS was implemented by the Kenyan Ministry of Agriculture, Livestock and Fisheries to tackle issues that prevent youth from actively engaging in agriculture. The Strategy was aimed at providing gainful employment opportunities for young people across different agricultural value chains. The Strategy was developed based on the urgent need to establish a youth-specific

policy that addresses the tedious nature of agricultural labour, youth attitudes to agriculture and the establishment of relevant value chain connections, among other things (Ministry of Agriculture Livestock and Fisheries, 2017).

In response to the numerous challenges, including but not limited to poor technical capacity, limited financial support, poor access to pre-established markets, and weak implementation of policies, which hinder youth from engaging in agriculture, the strategy adopted and implemented fourteen interventions that ensure equal access to agribusiness opportunities.

2.2.5 Youth Evergreen Entrepreneurship Programme (YEEP) - Kenya

The YEEP is a sustainable agribusiness model that seeks to expand opportunities for advancing climate-smart and sustainable agricultural development while also preferring solutions to the issue of youth unemployment in Kenya. Its main goal was to give young people a chance to develop their skills through capacity building in franchising, managing group franchises, and subsequently establishing agroforestry franchises (Alliance for a Green Revolution in Africa (AGRA), 2015). The programme used a franchise model to equip young people with seed capital, technical know-how, and useful networks to establish successful businesses in agroforestry.

2.2.6 The Empowering Novel Agribusiness-Led Employment (ENABLE) Technologies for African Agricultural Transformation (TAAT) Programme (Africa)

The ENABLE-TAAT programme was initiated to involve youth, aged 18-35 years, in the process of agricultural transformation and help tackle the issue of youth unemployment in Africa. It is one of fifteen components of the Technologies for African Agricultural Transformation (TAAT) Programme, which was implemented by the International Institute of

Tropical Agriculture (IITA) under the African Development Bank (AfDB) funding (IITA, 2020). The project had four main objectives. The first objective was to improve the agripreneurship capacities of youths and change their attitude towards agriculture. To achieve this, young people, aged 18-35 years, were trained along different agricultural value chains and supported to develop sustainable agribusinesses. Also, beneficiaries received mentorship from experts in their chosen agribusiness enterprise.

The second objective focused on providing support to youth-owned agribusinesses through advocacy and ICT. This was achieved by identifying within nine significant commodity value chains (including 7 crops, fish, and livestock) agribusiness opportunities that exist and scaling up these opportunities for youths to adopt. Also, it included showcasing participants and their businesses through major communication platforms including social media. The third objective was to improve young people's food security by promoting the adoption of nutrient-fortified commodities. This was achieved by creating a network of nutritional food basket demonstrations which was promoted via outreach initiatives that inform the beneficiaries about better varieties. The last objective focused on advancing youth empowerment mechanisms by developing a project coordination and management structure that advances TAAT interventions related to youth empowerment into the future. Overall, the emphasis was on improving the performance of youth-owned agribusinesses as well as youth livelihoods.

The 3-year programme was conducted across 19 African countries: Kenya, Nigeria, DR Congo, Tanzania, Zambia, and Uganda between 2018-2021. The programme, which was in its last funding year for the first phase during the time of data collection, provided intensive training, and mentorship to 4398 youths and facilitated the establishment and expansion of agribusiness ventures across different countries (IITA, 2020). With regards to the study locations, a total of

1384 youths, comprising 344, 440 and 600 beneficiaries from Kenya, Nigeria, and Uganda, respectively participated in the programme in the pilot year (2018). Participation was based on expression of interest. The following are the key training and support that the beneficiaries received.

1. Agribusiness entrepreneurship training: The participants received training in five core areas: (a) introduction to entrepreneurship, (b) qualities of a good entrepreneur, (c) identifying agribusiness opportunities, (d) how to develop a good agribusiness plan, (e) presenting and pitching business ideas
2. Business management training: Here, participants received training on (a) establishing and running an agribusiness, (b) systematic agribusiness planning, (c) cost and cost categorization, (d) Financial record keeping, (e) profit and loss analysis, (f) market analysis
3. Technical hands-on: Participants received technical training on crop and animal production and processing. Also, they were exposed to different value-addition activities that could improve their performance.
4. On-the-job training/Internship/Mentorship: After the main training activities, participants joined the agribusiness incubation programme where young agripreneurs had the opportunity to intern and gain real-world experience. Agripreneurs also received mentorship and support from experts in their respective businesses.

2.3 Youth Engagement in Agribusiness in Africa

Emerging Literature supports the argument that agribusiness will generate sustainable employment for many African youths in the coming years (Adeyanju *et al*., 2020; Africa Economic Outlook Report, 2017; Muthomi, 2017; Yami *et al*., 2019). Despite this, young people display declining interest in the sector (Yeboah *et al*., 2020). While Ogunmodede *et al*.

(2020) attribute this lack of interest to the lack of institutional support to mobilize and guide young people towards agribusiness, Adeyanju *et al*. (2021) relate it to the poor outlook of the agricultural sector and unfavourable agricultural policies to transform the sector. Even in the face of increasing favourable government policies and support, many young people see agriculture as not financially gratifying enough in a typified context of limited access to relevant assets and productive resources (Karki, Burton, & Mackey, 2020).

Besides, AbuMezied (2019) opined that factors including poor adoption of innovative agricultural technologies also discourage young people from establishing start-ups in the sector. However, beyond perception and productive resources, Yami *et al*. (2019) noted that youth ambition toward agribusiness engagement is influenced by a diverse set of socio-cultural and economic factors. Liu *et al*. (2020) found demographic factors such as the level of formal education as the key factors that drive youth away from agribusiness. Similarly, Ng'atigwa *et al*. (2020) found that more educated youth move towards formal employment and regard agricultural activities as labour-intensive jobs meant for uneducated people. This negative perception has led to the outward migration of young people from rural communities, where the bulk of agricultural activities are carried out, to urban centres in search of white-collar jobs. According to Hoffmann *et al*. (2019), rural-urban migration ranks high among the factors that affect youth engagement in agribusiness.

Even though the general narrative is that young people, particularly highly educated ones, snub a career in agribusiness (Kimaro *et al*., 2015; Liu *et al*., 2020; Ng'atigwa *et al*., 2020; Yeboah *et al*., 2020), few studies have highlighted the growing interest of educated youth in agribusiness and an emerging crop of young graduate entrepreneurs in the agri-food sector (Addo, 2018; Maïga *et al*., 2020; Thebe, 2018). The authors attributed this to personality traits

such as a penchant for agri-food activities as a means of livelihood and necessity, pull factors, including identified or given employment opportunities and push factors, such as unemployment and underemployment.

It is believed that this current influx of young graduates will help counteract an ageing farming population, transform the agricultural sector, and make a positive contribution to food and nutrition security (Ripoll *et al*., 2017). In agreement, Mungai *et al*. (2018) argued that youth engagement in agriculture is critical to meeting the global goal on zero hunger, addressing climate change, and achieving economic development. Özçatalbaş and Imran (2019) opined that 'involving and incentivizing' young people for participation in food production would help reduce rural poverty, increase food security, and drive agricultural innovations.

Based on this critical role of youth, Muthomi (2017) recommends the need for concerted efforts to support young people who intend to engage in the sector and the need to ensure access to agricultural resources and services. From a policy point of view, Udemezue (2019) suggests the need to include young people in dialogues on agricultural policies. In addition, he proposed that beyond perceiving youth as a unit of labour to be employed, their labour market aspirations and expectations coupled with the constraints they face should be considered and addressed.

2.4 Linking Agriculture to Entrepreneurship

Traditionally, the agricultural sector is considered to be a low-technology and less profitable sector, dominated by rural households, who practise traditional and subsistence agriculture. However, the narrative has dramatically changed over the past decades with evidence showing a gradual shift towards commercialization and modernization. Lans *et al*. (2013) attribute this change to economic reform, less agricultural market protection, and a rapidly changing and

more critical society. To fully adapt to this change, the authors proposed that entrepreneurship orientation and its adaptation to agriculture should be carefully considered. This corroborates the European Commission's sixth framework research report edited by Rudmann (2008) which documents the relevance of entrepreneurship to agriculture and highlights the entrepreneurship skills needed by farmers to succeed in agribusiness. According to the report, agricultural entrepreneurship could potentially help to boost agricultural productivity globally.

Despite the high relevance of agricultural entrepreneurship documented by Rudmann (2008), entrepreneurship research in relation to agriculture is relatively scarce (Hilmi, 2018; Mukembo, 2017; Nwibo *et al*., 2016; Sadat & Estahbanaty, 2013). Fitz-Koch *et al*. (2018) attribute this gap in the literature to the broad nature of entrepreneurship research which does not consider specific sectors. In agreement, Alsos *et al*. (2011) emphasized the need to develop a 'new' paradigm for agricultural entrepreneurship against considering it as an 'add-in' to the entrepreneurship paradigm.

Various definitions of agripreneurship have been put forth by scholars. Sadat and Estahbanaty (2013) defined agripreneurship as a value-creation process involving a unique set of resources to explore and capitalize on opportunities in rural areas. Volkmann *et al*. (2010) described it as a concept that involves risk-bearing and accepting uncertainties to develop a business venture, ultimately to obtain profits and higher returns on the investment. More elaborately, Hilmi (2018) defined it as the adoption of new methods and techniques in agriculture for better output and economic earnings through entrepreneurial activities. Narendran and Ranganathan (2015) advanced the definition beyond resource utilization and improved methods to include a community-oriented and direct-marketed form of agriculture.

These authors all attempted to merge agriculture with entrepreneurship to provide a clear definition of agripreneurship and highlight the expected gains from the concept. The common theme of these definitions is that agripreneurship entails the creation of agricultural products or the provision of valuable agricultural services for income generation and/or improved livelihoods (Mukembo, 2017). Thus, beyond creating a profitable agricultural enterprise, it captures numerous agricultural initiatives that could impact the economy positively and transform the general outlook of agriculture through the adaption of agricultural activities to entrepreneurial activities.

2.5 Entrepreneurship Skills Required by Farmers

Beyond food production, an entrepreneurial farmer is a businessman who is concerned with profit maximization and business expansion (Opolot *et al*., 2018). Farmers, in general, need specific skills in opportunity (market) identification, strategic planning, relationship building, and marketing to increase their productivity and competitiveness (Opolot *et al*., 2018). In addition to this, other scholars including Bolarinwa and Okolocha (2016) identified product development, record-keeping, risk-taking ability, and creativity as other important skills required to run viable agribusiness ventures.

Based on an extensive review of the literature, De Wolf *et al*. (2007) classified these skills into five groups presented in Table 2.1. According to the authors, professional skills are paramount to the success and survival of any agribusiness since no business can succeed without basic production and technical skills. Management skills are required to deal with the growing complexity related to agribusiness. Opportunity, Cooperation/Networking, and Strategic Skills are required to identify and pursue business opportunities, strategize to develop profitable agribusiness ventures, and establish and improve agribusinesses.

Table 2.1 Agripreneurship Skills Required by Farmers

Category	Underlying Skills
Professional Skills	- Crop or animal production - Technical skills
Management Skills	- Financial management and administration skills - Human resource management skills - General planning skills
Opportunity Skills	- Recognizing business opportunity - Market and customer orientation - Awareness of threats - Innovation skills - Risk management skills
Strategic Skills	- Skills to receive and make use of feedback - Reflection skills - Monitoring and evaluation skills - Conceptual skills - Strategic planning skills - Strategic decision-making skills - Goal-setting skills
Cooperation/Networking Skills	- Skills related to cooperating with other farmers and companies - Networking skills - Team working skills - Leadership skills

Source: Reprinted from "Exploring the Significance of Entrepreneurship in Agriculture" by De Wolf, Schoorlemmer, and Rudmann (2007), page 9.

Beyond farm management, Opolot *et al*. (2018) highlighted the relevance of these skills and competencies in strengthening farmers' abilities and attitudes towards agripreneurship. According to the authors, entrepreneurial skills and competencies are crucial to achieving better farm productivity that will lead to sustainable agricultural development for increased income and improved food security. In agreement, Hennon (2012) argued that entrepreneurial skills

such as creativity and risk-taking ability change farmers' orientation towards adopting new management practices and improved technologies which could contribute to their productivity.

Apata (2015) linked entrepreneurship skills to better productivity and income, Heenkenda and Chandrakumara (2016) linked them to better farm-level performance, while other authors have found that entrepreneurship skills help farmers to explore new enterprise growth pathways and demonstrate higher capacity in opportunity recognition and business growth (Fitz-Koch *et al*., 2018; Presha & Farrell, 2017). Thus, applying entrepreneurship skills to agriculture could generate better outcomes for farmers and agribusiness owners.

2.6 Skill Acquisition Through Entrepreneurship Programmes

The argument that entrepreneurs are born has been countered by a few scholars who believe that entrepreneurial skills for viable business creation can be instilled in individuals through formal and non-formal education, including business incubation based on practical approaches (Matlay *et al*., 2015; Scott *et al*., 2016). This argument is further strengthened by Valerio *et al*. (2014) who posited that beyond innate abilities, entrepreneurial skills could be learned via active experimentation. In agreement, Amadi (2012) relates entrepreneurial skill acquisition to learning a collection of skills or adopting entrepreneurial behaviour for the creation of viable business ventures and employment.

Even though Dare *et al*. (2019) described entrepreneurship programmes as a collection of processes designed to equip people with the necessary skills needed for entrepreneurial activities, there is mixed evidence on the extent to which entrepreneurship programmes aid skills acquisition. In his study on 'Reducing Recidivism Through Entrepreneurship Programmes,' Cooney (2012) argued that to some extent, entrepreneurship competence

depends on individual characteristics and may be hard to engender in a group or structured programme.

Similarly, Henry *et al*. (2003) faulted entrepreneurship interventions for being overly functional in their focus rather than assisting entrepreneurs to develop broader innovative capabilities, keep up with their changing business environments, and be creative in developing and advancing their businesses. Generally, these authors recognized the benefits of entrepreneurship programmes in providing participants insights into the areas where they lack knowledge or expertise but, their argument follows that programmes may not necessarily lead to skill acquisition and development.

Despite this ongoing criticism of entrepreneurship programmes for their generic nature, a few studies have established their relevance to skill acquisition in developing countries. For instance, Opolot *et al*. (2018) assessed how entrepreneurship training influences farmers' competencies for better market access and productivity in Uganda. A positive relationship was found between training and farmers' entrepreneurship skills (record-keeping ability, marketing, and value addition), including agricultural production and technical skills.

Similarly, Saripah *et al*. (2020) reported the significance of the 'Entrepreneurship Skill Education Programme in Indonesia' in empowering rural communities through better entrepreneurial knowledge, skills and attitudes. This also corroborates with Drexler *et al*. (2014) and Giné and Mansuri (2014) whose studies established a positive relationship between entrepreneurship programmes and business skills. Stevenson and St-Onge (2005) concluded that entrepreneurship training allows actors in growth industries such as agriculture to better explore the value chain within their distinct sectors.

There are relatively few reports on agribusiness empowerment programmes. In their study on "Training for Rural Development: Agricultural and Enterprise Skills for Women Smallholders," Collett and Gale (2009) reported that enterprise training could improve the risk-bearing capacity as well as the management and market skills of farmers. The research is, however, different from the current one as it only focused on women.

Overall, some studies on business empowerment programmes have shown very small and weak statistically significant impacts (Alcid *et al.,* 2022; Blattman *et al.,* 2019; De Mel, *et al.,* 2012; Drexler *et al.,* 2014; Tama *et al.*, 2021) while a few studies have found positive and significant impacts (Adeyanju *et al.,* 2021; Amoros & Bosma, 2014; Chakravarty *et al.*, 2019; Cho & Honorati, 2013; Haji and Legesse, 2017). This is largely attributed to contextual issues, programme designs, small sizes, and methodological issues. This study extends other studies by taking a larger sample size and assessing a regional agribusiness programme specifically designed for youths.

2.7 Linkages between Empowerment Programmes, Job Creation, Income and Livelihood

There has been very little rigorous evidence on the impact of empowerment programmes on livelihoods until recently. The overview of evidence from the few existing studies also seems to have divergent views on the relationship between programmes and livelihood outcomes, which is quite understandable given the heterogeneous nature of programmes, methods adopted, and the conditions under which programmes are implemented. This corroborates McKenzie and Woodruff (2014) who found mixed evidence from an in-depth review of non-experimental studies on the impact of empowerment programmes in developed, developing and transition countries.

A cross-sectional survey of 164 participants and 81 non-participants of the Kaonafatsw ya Dikgomo (KyD) programme in South Africa revealed a 22 percent reduction in the production risk of participants, indicating that participation could lead to increased income (Ngarava *et al*., 2018). The study, however, did not find a direct link between income and participation. Bhardwaj *et al*. (2020) assessed the water-shed management programme in India and found a considerable improvement in participants' socioeconomic and agricultural attributes. Specifically, the study linked participation to increased employment opportunities and income which led to poverty reduction and improved living standards among participants. The focus of the current study on young graduates and the empirical models used differentiates it from this study.

Similarly, Anusha (2019) evaluated the Skill Development Programmes implemented by Rudseti in Karnataka. It was found that the programmes led to increased access to credit facilities and job creation among the participants. The study further revealed the link between access to credit and the decision to start a business. Even though the study followed a case study approach, the content of the programmes evaluated and the conditions under which it was conducted differentiate it from the current study. Using a sample of 1,500 youths, Premand *et al*. (2012) assessed "Entrepreneurship Training and Self-employment among University Graduates" in Tunisia. It was found that participation increased the rate of self-employment among the respondents. Al-Mubaraki and Busler (2013) assessed the effect of business incubation programmes on job creation in selected developing countries including Jordan, Bahrain, Syria, and Morocco. It was found that the case studies led to the creation of 2,179 jobs and 652 registered companies. Similarly, assessing the Technology and Business Incubation Facility (TBIF) in Rwanda, Aggarwal, Siddiqaliali, and Kumar (2012) found that the

programme fostered employment creation among university graduates with a total of 164 jobs created. Evidence presented by Yami *et al*. (2019) from the agribusiness parks in DRC which trained youth on the use of improved technologies and value-addition revealed that aside from job creation, participation resulted in increased income and improved livelihood. In agreement with McKenzie and Woodruff (2014), entrepreneurship programmes seem to be one of the most prevalent types of active assistance which has led to job creation and income generation around the world, particularly in Africa.

However, the relationship between empowerment programmes and economic outcomes is not one-way. A few studies have reported that programmes do not always guarantee better economic outcomes. Czyzewski *et al*. (2018) who found a negative impact of the CAP green programmes on farmers' productivity, explained that impact directions depend on the type of the programme under evaluation and the sustainability of agricultural activities in the study area. For instance, Ebiringa (2012) found that entrepreneurship interventions aimed at stimulating entrepreneurship development through job creation in Nigeria did not succeed. Similarly, months after participating in a business training programme in India, Field *et al*. (2010) found that the programme had no impact on the income of lower-caste Hindu and Muslim women who participated in the programmes. This lack of impact was attributed to extreme social restrictions. These contradicting results suggest that programme impacts are contextual and therefore necessitate a comparative assessment of programmes across different countries in which programmes are being implemented.

2.8 Measuring the Impact of Agricultural Interventions on Income and Food Security

Because of the complex relationship between income and food security, agricultural programmes have become an appealing instrument for simultaneously increasing farmers'

income and improving their food security status. In Africa, very few studies have thoroughly assessed the impacts of agricultural empowerment interventions on income and food security outcomes at regional levels. While there is evidence of income contributions, claims of impacts on food security are generally frail or sometimes implied (Adu *et al*., 2018; Stewart *et al*., 2015).

Adu *et al*. (2018) observed that successful implementation of agricultural interventions is often equated to an impact on food security. However, the authors argued that this is largely based on intuition rather than on empirical evidence. For instance, the Innovation for Rural Prosperity (IRP) project implemented in Ghana was assumed to impact food security based on increased access of the beneficiaries to credits and extension services. Even though the plausibility of such conditions may likely improve food security through increased income, the lack of empirical evidence to show precisely how or which aspect of food security was enhanced and the scale of such enhancement makes such claims more intuitive than verifiable (Adu *et al*., 2018).

To corroborate this, Bodnár *et al*. (2011) argued that while increased income might be a good proxy indicator for food security, actual assessment of food availability and accessibility could be a robust indicator for measuring the impact of interventions on food security since increased income may not always translate into improved food security, particularly for low-income households. This is supported by Adu *et al*. (2018) who conducted a meta-analysis of several agricultural interventions implemented in Ghana and found that although income increased for programme beneficiaries, the food security status of low-income households remained unchanged, suggesting that programmes may not be proportionately beneficial to those currently within the critical poverty level. Stewart *et al*. (2015) found that agricultural

innovations can potentially increase the nutritional status of farmers and to a lesser degree, their income. However, no significant impact was found between training interventions and farmers' value of harvest. These authors, therefore, suggested the need for more rigorous research, specifically theory-based impact evaluations of agricultural interventions to thoroughly explore the subject.

It is worth noting that many studies on food security outcomes focus on women and children (Ahmed *et al.,* 2021; Agrawal *et al*., 2019; Aziz *et al*., 2022; Drennen *et al.,* 2019; Liu *et al.*, 2021; Papadopoulou *et al.,* 2019). Stewart *et al*. (2015) argued that the exclusion of male adults and youth from programme evaluation may jeopardize the generalizability of outcomes because it excludes a sizable portion of the general population. As suggested by Bodnár *et al*. (2011), the current study assessed how agribusiness interventions impact youths' food security status, focusing on actual food consumption as a proxy for food security. The impact on income was also assessed.

2.9 Review of Impact Studies on Agribusiness Empowerment Programmes

Empowerment programmes are popular policy options to crop more youth into agribusiness and improve the performance of youth-owned agribusiness enterprises in developing countries. However, there have been very few rigorous assessments of these programmes and studies on youth agripreneurship are relatively scarce. A critical review of existing literature shows that many studies suffer from small sample sizes, measure impacts only within a few weeks/months after training, which may be too short to draw any valid conclusions and experience measurement problems that question the validity of their results (Abdussalam, 2015; Ajayi, 2017; Ogunmodede *et al.*, 2021; Singh *et al*., 2010; Yamta & Midala, 2014).

For instance, Abdussalam (2015) adopted the Pearson Product-moment Correlation Coefficient to analyse the impact of youth empowerment schemes on poverty alleviation in Nigeria. The strong and positive relationship found between the Scheme and poverty alleviation led to the conclusion that empowerment schemes are highly significant measures to alleviate poverty among young people. However, against its title, this study only modelled the correlation between the two variables, rather than measuring impacts. Also, it was not sector-specific which makes it more likely to conceal important policy information on sectoral entrepreneurship. Thus, there is a need to empirically assess the impact of programmes using rigorous analytical methods.

Nationally, the few existing studies also seem to focus on documenting existing empowerment programmes and identifying the determinants of youth participation in these programmes rather than measuring the impact on personal and economic outcomes (Addo, 2018; Nwibo *et al*., 2016). An example is Waziri and Idris (2019) who assessed youth empowerment programmes as a strategy for poverty alleviation and national development in Nigeria. Based on personal intuition and without any rigorous empirical analysis, the authors concluded that youth empowerment programmes could lead to self-sustained development among young people and reduce their reliance on the government for employment. These conclusions, however, are not likely to drive practical policy on the subject since they are only based on the authors' perception and raise the need for more empirical investigations into the subject.

Generally, empirical evidence on the impact of agripreneurship is very limited. The majority of existing literature is not sector-specific and tends to focus on general entrepreneurship which may not likely drive practical policymaking in the field of agripreneurship (McKenzie & Woodruff, 2014; Mohamed & AliShiekh, 2017; Saripah *et al.*, 2020).

Globally, an overview of evidence from the very few existing studies also seems to have divergent views on the relationship between empowerment programmes and livelihood outcomes (Al-Mubaraki & Busler, 2013; Ebiringa, 2012; Premand *et al.*, 2012), which is quite understandable given the heterogeneous nature of programmes, methods adopted, and the conditions under which programmes are implemented. The majority of these studies, however, did not focus on agribusiness empowerment programmes, thereby limiting the extent to which they can inform discussions on youth agripreneurship.

This study intends to address some of the gaps identified in the literature. Concerning sample size, the study took samples from three African countries to assess the impact of agribusiness programmes on the specified outcomes. Unlike studies that aggregated their analysis on youth entrepreneurship, this study focused solely on agripreneurship, thereby generating evidence that can inform practical policy on the subject. Also, only a few studies have examined food security from a youth perspective (Brooks *et al.*, 2013; Owen & Goldin, 2015). This study fills this gap in literature, as this was one of the core objectives of the programme used as the case study.

2.10 Empirical Review of Previous Programme Impact Assessment Studies and Methods

Several econometric methods have been applied in the literature to estimate the impact of empowerment programmes on a range of economic and social outcomes. For instance, Opolot *et al*. (2018) used a multiple regression analysis with Ordinary Least Square (OLS) to assess the joint effect of entrepreneurship programmes on farmers' competencies for better market access and productivity in Uganda. While the authors found a positive relationship between training and farmers' entrepreneurship skills (record-keeping ability, marketing, and value addition), including agricultural production and technical skills, their methodological approach

was less rigorous and did not address the fundamental issues of selection bias and unobserved counterfactual which therefore, questions the validity of the impact estimates.

Following a more rigorous approach, Drexler *et al*. (2014) applied the Difference-in-Difference (DiD) method to compare the effects of two different programmes: standard accounting training and a more condensed, rule-of-thumb training that covered fundamental financial heuristics. The objective reporting quality, financial practices, and revenue of the firms were all significantly enhanced by the rule-of-thumb training. Similarly, Unnikrishnan *et al*. (2022) used the same method to assess the impact of an integrated skills training programme offered to youths between 17 and 25 years living below the poverty line in the cocoa belt region of Ghana. Their results showed that participants were more likely to engage in farming, adopt better agricultural practices, use digital innovations, and earn higher incomes compared to non-participants. While the DiD method used in both studies focused on double or multiple-difference estimators and generated valid estimates that can be ascribed to treatment, it cannot be used for cross-sectional datasets and when pre-intervention information is unavailable (Lechner, 2011). Thus, while this method is desirable, it is inappropriate for the current study due to the lack of baseline data.

Pastore and Pompili (2019) used a less restrictive method, the Propensity Score Matching (PSM) method, that matches subjects based on propensity scores as opposed to multiple variables (Haji and Legesse, 2017) to estimate the impact of an integrated programme of active labour policies on employment integration. While on-the-job training had a positive impact on employment integration, off-the-job training had no impact on employment. This method has two major advantages: it does not require randomization or baseline data, and it relaxes the constrictive functional form assumptions imposed by parametric regression models. However,

the method does not account for self-selectivity and unobserved characteristics which questions the validity of the impact estimates.

Another prominent method is the Regression Discontinuity Design (RDD) method commonly used for programmes with continuous eligibility index. However, the use of this method is dependent on a pre-defined continuous measure on which the population of interest can be ranked and a clearly defined eligibility cut-off score (Gertler *et al.*, 2016). Entities are assigned to treatment and control groups based on these cut-off scores. The key assumption is that the population below and those above the threshold are similar. Thus, the outcomes of entities lying closely on either side of the threshold are compared to estimate programme impact. Ogunmodede *et al*. (2020) used this method to assess the impact of an agricultural programme designed for young graduates in Nigeria on income generation. While this method generates valid estimates for the sample under the study, one major criticism is that the impact estimates generated cannot be generalized for the entire population (Gertler *et al.*, 2016), thereby limiting its contribution to nationwide or regional policies. Also, the method does not fit into the context of the current study since there were no pre-defined cut-off scores used in assigning individuals to treatment or control groups.

Many authors have combined two or more methods to assess programme impacts. For instance, Bello *et al*. (2021) examined the impact of the YIA programme on gainful employment creation among young people using both the PSM and endogenous switching probit techniques. Their results indicate that the level of formal education, access to training, off-farm employment, group membership, access to credit, and residence significantly influenced programme participation decisions. Also, they found a positive and significant impact on gainful

employment among the youth. However, this study differs from the current one based on the estimation models used.

Also, Balde *et al*. (2019) assessed the "Food Security Outcomes of Smallholder Oil Palm and Rubber Production at the Household Level in the Forest Region of Guinea" using both PSM and Endogenous Treatment Effect Regression (ETER) models. The results of both models showed that subsistence farmers perform better than oil palm and rubber smallholder farmers in terms of food diversity but were worse off on hunger perceptions and coping behaviours metrics. The current study also used an ETER model to assess programme's impact on youth livelihoods (income and food security). However, the study differs in terms of the population category assessed.

Using a quasi-experimental approach, Chakravarty *et al*. (2019) assessed the short-term influence of skills training and employment placement services in Nepal. Three years after the programme, the study established a positive link between the intervention and employment outcomes. Participation boosted off-farm employment and higher average monthly earnings profit. However, compared to the current study that focused on youth graduates, they focused on young women. Also, the training assessed is classroom-based and was not on agribusiness or agripreneurship.

Overall, studies have shown that assessing programme impact in the absence of a Randomized Control Trial (RCT) is quite challenging due to issues of sample selection and endogeneity biases. Many studies also used quasi-experimental methods to assess programme impact. However, the lack of baseline data and the cross-sectional nature of the dataset used in the current study limits the choice of empirical methods to Instrumental Variable (IV) models, as

other methods such as DiD and Reflective Comparison methods cannot be used in the absence of pre-treatment data or conditions. Within this context, many studies have applied the PSM method which has been criticized for its limitations in assessing unobservable characteristics likely to affect the assignment/treatment variable, thereby posing a selectivity bias (Adeyanju *et al*., 2021).

However, the Endogenous Treatment Effect models have been identified to address such limitations by accounting for endogeneity that may result from both observed and unobserved factors and equally provide the Average Treatment Effect (ATE) of the endogenous dummy variable on the dependent variable (Adeyanju *et al*., 2021; Balde *et al*., 2019; Mensah *et al*., 2021; Ogunniyi *et al*., 2018; Zhong *et al*., 2021). The ATE estimate is the same as the Average Treatment Effect on the Treated (ATT) when the treatment variable is not interacted with any of the explanatory variables in the outcome model (Nyaaba *et al*., 2019).

Based on the reasons highlighted above, the Endogenous Switching Regression (ESR) and Endogenous Treatment Effect Regression (ETER) models were used to achieve the study's objectives. Specifically, following Ogunniyi *et al*. (2018), ESR was adopted to estimate the impact of programme participation on agripreneurship skills development and job creation capacity. For diversity, the ETER was adopted to estimate the impact on youth livelihoods (income and food security).

2.11 Methods of Measuring Job Creation

It is quite difficult to justify the expenses of empowerment programmes in relation to their benefits regarding job creation (Mwatsika, 2016). According to Mwatsika (2016), the success of programmes that seek to empower people through entrepreneurship depends on several

factors including, but not limited to the criteria used in selecting the participants, the content and delivery methods of the programme, quality of business and implementation plans, and how the entire process is coordinated in line with various existing entrepreneurial support initiatives.

Fowler and Markel (2014) identified two broad approaches through which job creation can be measured. The first approach is a direct method, using employer records, conducting employer surveys, or surveying employees. It is, however, very expensive, especially if the sample size is large. In applying this method, Mwatsika (2016) noted that the number of jobs created will be the sum of all jobs created in each new business enterprise established following an empowerment programme.

The second approach involves using localized job multipliers or estimating the employment elasticity of income generated by a specific programme. The job multiplier approach is described as an input/output model that is used in estimating the number of jobs created in a target market system or economy due to a change in another indicator, such as investment, Gross Domestic Product (GDP), firm revenues, or levels of production. This method is less expensive compared to the direct methods but, it has also been criticized for its unrealistic assumptions which may question the calculated employment estimates since multipliers are calculated based on past relationships between variables with the hope that these same relationships will hold in the future (Fowler & Markel, 2014).

Considering that the current study is survey-based, the direct approach which includes the survey of employers was adopted in the current study. According to Fowler and Markel (2014), this method helps to obtain estimates that could be attributed to a particular programme or

intervention and therefore, aligns with the specific objective of the study which aims to assess the programme's impact on the number of jobs created by the respondents. In this context, employers are the participants and non-participants of the ENABLE-TAAT programme.

2.12 Theoretical Framework

The study is anchored on the theory of random utility maximization and programme impact theory.

2.12.1 Theory of Random Utility Maximization

According to the utility maximization theory, the decision-maker (youth) is assumed to be a rational economic agent who, when faced with a set of alternatives, will opt for an alternative that gives the best utility (Greene, 2003). In this study, a youth is faced with two sets of alternatives k and l which can be presented as follows:

$$Z = \{k, l\} \quad \text{(i)}$$

Where Z represents the set of alternatives, k denotes the decision to participate in the ENABLE TAAT programme and l represents the decision not to participate.

Based on this theory, participation decisions are made when the expected utility of participation significantly outweighs the utility of not participating. According to Wekesa (2017), the utility of each choice has two components, the deterministic and the error components. The latter follows a pre-determined distribution and is not dependent on the former, making it difficult to predict with certainty the alternative a youth will select. Thus, utility is directly unobservable. Also, the probability that the expected utility associated with a particular alternative can be assumed to be greater than all other available alternatives (Cascetta, *et al*., 2015).

The utility that a youth, i gains from participation or otherwise is made up of an observable deterministic component, X (the utility function) and a random component ε. Thus, the linear random utility can be expressed as:

$$U_k = \beta_k X_k + \varepsilon_k \text{ and } U_l = \beta_l X_l + \varepsilon_l \quad \text{(ii)}$$

Where;

U_k and U_l represent the perceived utilities of participation and non-participation choices k and l , respectively.

X_k *and* X_l are the deterministic components (vectors of explanatory variables that affect the decision to participate/not to participate).

$B_k$and β_l are vectors of the parameter to be estimated

ε_k and ε_l are the Independently and Identically Distributed (IID) error terms.

If a youth decides to participate in the programme, i.e. chooses option k, then it implies that U_k is greater U_l as shown in Equation (iii).

$$U_k(B_k X_k + \varepsilon_k) > U_l(B_l X_l + \varepsilon_l), k \neq l \quad \text{(iii)}$$

Thus, the probability of participation can be expressed as:

$$P(Y = 1|X) = P(U_k > U_l) \quad \text{(iv)}$$

$$= P(B_k' X_k + \varepsilon_k - B_l' X_l - \varepsilon_l > 0|X) \quad \text{(v)}$$

$$= P(B_k' X_k - B_l' X_l + \varepsilon_k - \varepsilon_l > 0|X) \quad \text{(vi)}$$

$$= P(B^* X_l + \varepsilon^* > 0|X = F(B^* X_k) \quad \text{(vii)}$$

Where P is the probability function;

$\varepsilon^* = \varepsilon_k - \varepsilon_l$ is the random error term;

$F(B^*X_k)$ is the cumulative distribution function of ε* estimated at B^*X_k;

$B^* = (B_k' - B_l')$ is a vector of the net effect of the explanatory variables affecting participation decisions.

2.12.2 The Programme Impact Theory

The Programme Impact theory, also known as programme logic (Funnell, 1997), the theory of action (Schorr, 1998), the theory of change (Weiss, 2001; Rogers, 2014), and theory-driven evaluation (Chen, 2006, 2012), refers to a variety of ways of developing a causal modal linking programme inputs and activities to a chain of intended or observed outcomes. According to Truman and Trisk (2001), the theory refers to the hypothesised cause-and-effect pathways that connect a programme's activities to its expected outcomes. It describes explicitly how the programme inputs produce the identified outcomes and identifies the intermediary factors through which the programme may exert its impact coupled with those that may modify or inhibit the desired effect (Habicht, Pelto, & Lapp, 2009; Leroy, Ruel, & Verhofstadt, 2009; Rossi, Lipsey, & Freeman, 2004).

In developing the theoretical framework, several core concepts from the Realist Evaluation were considered. The idea behind this is that the extent to which the ENABLE TAAT programme brings about the expected change depends on how the beneficiaries interpret, accept, and utilize the direct and indirect outputs of the programme. According to Westhorp (2014), programmes activate underlying causal mechanisms which are often ingrained in cognitive processes and influenced by history and context.

The theory also identifies and describes the chain of events resulting from the activities and strategies implemented by the ENABLE TAAT programme and relates them to its expected

outcomes. Following Chen (2006), the theory focuses on three distinct components. (a) the intervention, which describes the activities and processes adopted by the programme to generate desirable outcomes; (b) the outcomes, which denote the expected results or effects of the programme on its intended beneficiaries; and (c) the determinants, which refers to the mediating mechanisms between the outcomes and intervention. The theory holds that a direct relationship exists between the intervention and the determinants. It is believed that the programme's implementation will affect the determinants, and consequently bring about changes in the outcomes.

The theory further asserts that achieving the expected outcomes (Skills, job creation capacity and food security status) is dependent on the successful implementation of the activities and strategies of the programme. It is believed that the provision of support (training, mentorship, etc.) will enable youth to acquire the required agripreneurship skills to run viable agribusinesses. In turn, these businesses will generate steady income and in the long run, lead to business expansion which will also reflect on their job creation capacity and food security status.

2.13 Summary

In this chapter, discussions have been presented on theoretical and empirical review of youth engagement in agribusiness, agripreneurship skills, and agribusiness empowerment interventions in Africa as well as their impacts on economic and livelihood outcomes. Generally, it was noted that numerous agribusiness interventions target youths and some have been specifically designed for young graduates. However, most of the published research focuses on generic entrepreneurship programmes while studies on the impact of youth agribusiness programmes are just emerging. The need for empirical analysis was highlighted.

Also, studies on agribusiness empowerment interventions have mostly focused on factors that determined participation. The few studies that assessed impact are based on small sample sizes and a comparativeness of what works in different countries is missing. Also, the role of agriculture and small agribusinesses in employment generation for youth within a rapidly transforming Africa is poorly understood. What remains unclear is whether the current influx of young Africans into the agricultural sector has a spillover effect on job creation or not. The need for rigorous impact assessment was highlighted.

Various methods of assessing programme impact have been critically reviewed, and it was concluded that the endogenous models (ESR and ETER) would be ideal to achieve valid impact estimates in the context of the current study. Finally, two major methods of assessing job creation were discussed, and it was concluded that the direct approach is more applicable to the study context as it can help to obtain estimates that could be attributed to the programme or intervention under study.

CHAPTER THREE

GENERAL METHODOLOGY

3.1 Conceptual Framework

Agribusiness Empowerment programmes explicitly focus on building knowledge and the agripreneurial skills required to start and operate agribusiness enterprises. Also, they are believed to influence individuals' knowledge structure, thereby influencing their decisions/intentions towards agripreneurship. The conceptual framework categorizes the outcomes of the ENABLE TAAT programme into a series of four domains.

The first, agripreneurship skills, include agribusiness management skills, accounting, marketing, risk-bearing, and technical skills which could aid agripreneurship activities. The second, agripreneurial status, refers to the temporal state of a programme beneficiary based on agripreneurial activities (e.g., starting an agribusiness, becoming employed in the agricultural sector, and achieving a higher income) (Valerio *et al*., 2014). The third component, job creation capacity describes explicitly how the indicators of the performance of an agribusiness enterprise have changed as a result of the programme. This is measured in terms of number of people employed. Lastly, the fourth domain relates to the change in the livelihood outcomes of the beneficiaries which can be attributed to the programme. This last domain focuses on two livelihood outcomes, income and food security status. The latter objective was included based on the specific goal of the programme to improve food security among youths. As such, the conceptual framework captures other factors that determine food security among youths. This is because strategies to improve food security must capture desirable attributes that relate to the population of interest.

Programme participation is hypothesized to lead to the acquisition of basic agripreneurship skills needed to run and manage viable agribusiness enterprises and improve youth agripreneurship performance measured by job creation capacity. Also, participation is expected to lead to higher income through increased production and improve youths' food security status. In addition to the specified outcomes, the framework situates two dimensions identified by Valerio *et al*. (2014) as explanatory variables in modelling the relationship between the outcomes (agripreneurship skills, job creation, income, and food security status) and the Programme: (a) A series of economic, political, and cultural contextual factors related to the outcomes, and (b) the characteristics of participants, including personality traits, education, interests, perception, demographic, agripreneurship, among others.

The basic assumption is that skill acquisition may not mean so much in the absence of favourable economic, political and cultural environments. For instance, a potentially skilled youth may not succeed as an agripreneur without access to basic infrastructure and financial resources. Thus, economic (such as basic local infrastructure, investment climate, and regulatory structures), political (policy actions, support for programmes, among others), and cultural (Norms, Beliefs, Values, etc.) factors will directly or indirectly affect the programme and its expected outcomes. Specifically, external environment/factors such as policy, law, and political dynamics will directly affect agribusiness empowerment (ENABLE-TAAT) programmes while personal characteristics such as demographic and personality traits, education, and agripreneurship experience will influence youth decision to engage in these programmes.

Furthermore, it is assumed that agripreneurship skills, job creation capacity, income, and food security will be influenced by some dynamics associated with participants' socioeconomic,

demographic, and institutional characteristics including age, access to services, perceptions, asset ownership, credit facilities, and residence, among other factors.

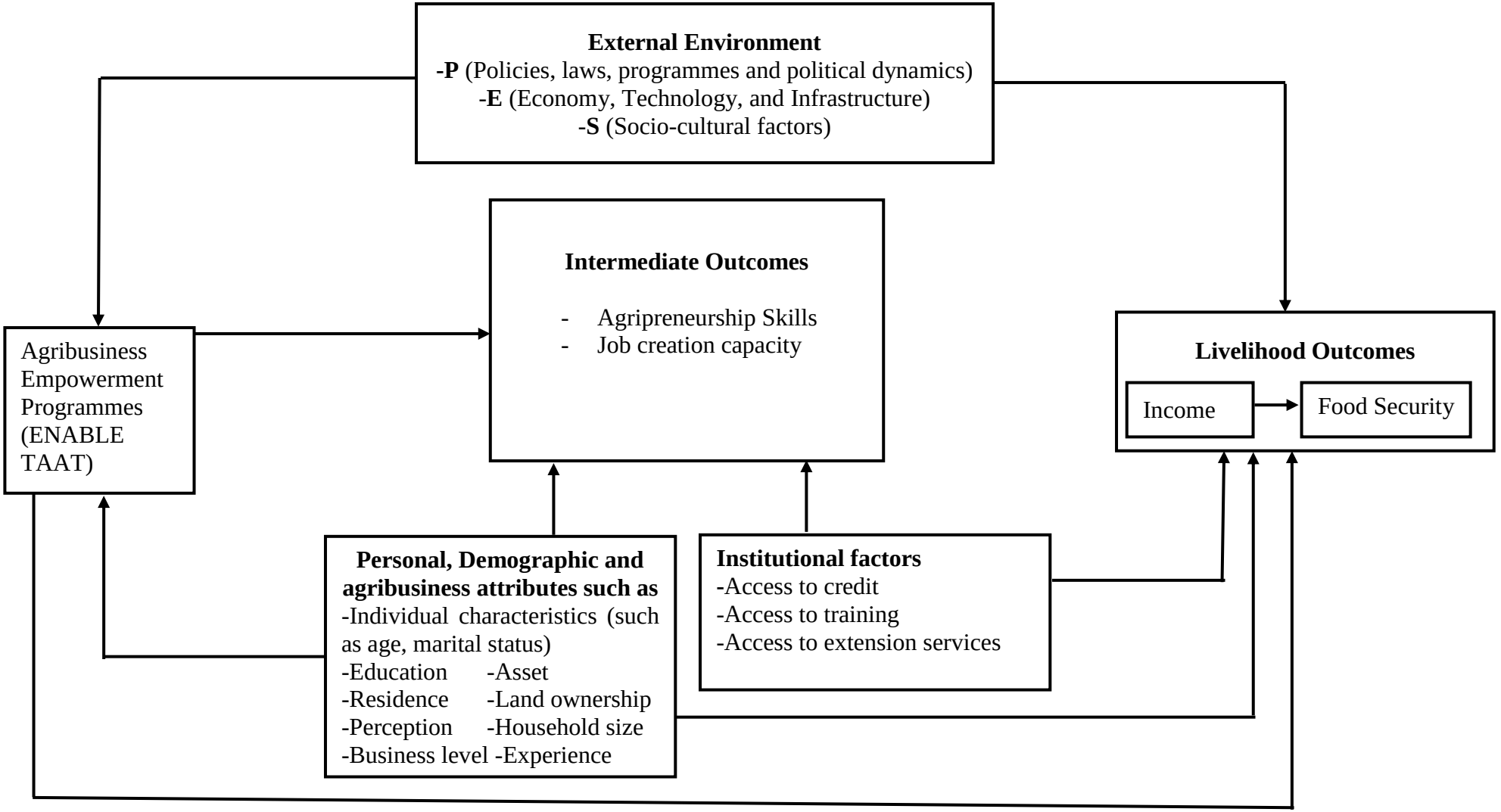

Figure 3.1: Conceptual Framework of the Impacts of Youth Agribusiness Empowerment Programmes

3.2 Description of the Study Area

The study was conducted in Kenya, Nigeria, and Uganda, three countries that ranked high in youth population among the countries where the ENABLE-TAAT programme was implemented and with serious issues of youth unemployment. These three countries were selected based on three important criteria. First, they are three of the pioneering countries in which the ENABLE-TAAT programme was conducted in 2018. The second criterion is related to the severity of graduate youth unemployment and underemployment, while the third criterion is based on the relatively high number of programme participants compared to the other countries. From an economic and cultural perspective, it is believed that it would be cognitively beneficial to have a reference point in data from different countries in which the programme was implemented as this could contribute to obtaining more adequate and in-depth judgments on the impact of the programme. Besides, the countries have noticeable similarities in the role of micro and medium-sized agro-enterprises which contribute significantly to employment and food security.

3.2.1 Kenya

Kenya, with an area of 580,367 square kilometres and 47.6 million people (Kenya National Bureau of Statistics, 2019), has an agriculture-based economy. The country is located in East Africa, bordered by Ethiopia, Uganda, Somalia, and Tanzania to the north, west, east, and south, respectively. Agriculture supports food security and economic development by supplying the majority of basic food for consumers, employing approximately 75 percent of the labour force, contributing 24 percent of GDP, accounting for more than 50 percent of export revenue and 45 percent of government revenue, and providing subsistence and other income to the majority of the population (The Country Policy and Information Team, 2020). Large-scale

farming on farms of 50 hectares or more primarily produces industrial crops such as wheat, tea, maize, and coffee, as well as livestock on a land area of about 30,000 hectares (FAO, 2015). Thirty-five percent of the population are youth who are in their active productive years. About 1,000,000 enter the labour market annually, but less than 20 percent can secure sustainable employment, compounding the issue of youth unemployment (Ministry of Agriculture Livestock and Fisheries, 2017). According to the Kenyan Ministry of Agriculture Livestock and Fisheries (2017), about 64 percent of the unemployed populace (put at 40 percent of the population) are the youth. As a strategy to reduce youth unemployment and underemployment, the government and development partners have been implementing different programmes to increase youth participation in agribusiness for decades. This includes the Kenya Youth Agribusiness Strategy (KYAS) which aims to provide innovative opportunities for youth along the agricultural value chain, Youth Evergreen Entrepreneurship Programme (YEEP), the Kenyan Youth Empowerment Programme (KYEP), and the ENABLE TAAT Programme, among others.

3.2.2 Nigeria

Located in West Africa, Nigeria is the most populous country in Africa and the seventh most populous in the world (World Bank, 2019). The population is 202 million people covering an area of 923,768 km2. The country is bordered to the east, west, south, and north by Chad and Cameroon, Benin, the Gulf of Guinea of the Atlantic Ocean, and Niger, respectively. Nigeria is largely a youthful country, with about 65 percent of the population between 18 - 35 years old, out of which over 80 per cent are reported to be jobless (Surajo, 2016). As of the third quarter of 2018, youth unemployment and underemployment averaged 55.4 percent compared

to 52.6 percent in the same period of the previous year (2017) (National Bureau of Statistics, 2018), indicating a 5 percent increase in the space of one year.

Many people generate their livelihoods from agriculture and related activities. Current estimates suggest that over 70 percent of the economically active labour force are engaged in agriculture as smallholders. Petty trading is an adjunct to agriculture with local and imported goods being exchanged for cash (Nwajiuba, 2012; Ogbalubi & Wokocha, 2013; Ogunleye, 2017). Entrepreneurship development as a strategy to reduce youth unemployment, alleviate poverty and accumulate wealth has a long history in the country. This is reflected in several initiatives, such as the National Directorate of Employment (NDE) programmes, the National Open Apprenticeship Scheme, Subsidy Reinvestment and Empowerment Programme (SURE-P), Small and Medium Enterprise Development Association of Nigeria (SMEDAN), efforts have been underway to provide immediate and direct jobs to young people interested in entrepreneurship.

Concerning agribusiness, several programmes to facilitate youth agripreneurship have also been implemented. This includes the Npower Agro programme, the Fadama Graduate Unemployed Youths and Women Support (GUYS) Programme, Youth Employment in Agriculture Programme (YEAP), The Livelihood Improvement Family Enterprise (LIFE), Youth Initiatives for Sustainable Agriculture (YISA), and ENABLE TAAT Programme, whose activities focused on empowering young graduates in the field of agribusiness.

3.2.3 Uganda

Uganda, a landlocked nation in East Africa, shares is bordered by Kenya, the Democratic Republic of the Congo, South Sudan, and Tanzania to the east, west, north, and south,

respectively. The population is roughly 49 million people, with 8.5 million residing in its capital city, Kampala. The youth constitute a sizable proportion of the productive workforce, and their labour underutilization rate is approximately 43.5 percent (Uganda Bureau of Statistics (UBOS), 2021).

According to FAO, Uganda's fertile agricultural land could potentially feed 200 million people. Arable land accounts for 80 percent of the total land area. Of this, only 35 percent is being cultivated. Agriculture accounts for about 24.1 percent of GDP, 33 percent of export earnings and about 80 percent of the working population (Uganda Bureau of Statistics (UBOS), 2021). Uganda produces a variety of agricultural goods, such as coffee, tea, sugar, livestock, cassava, fish, corn, plantains, beans, sweet potatoes, edible oils, and millet. The production is vulnerable to climatic extremes and pest infestations due to farmers' poor use of high-quality fertilizer and seeds, as well as a lack of irrigation infrastructure, which prevents the sector from becoming commercially viable.

Like many other African countries, youth unemployment is a major challenge in Uganda. The youth unemployment rate is estimated at over 34 percent (Wamajji & Mubangizi, 2022). Unemployment is more pronounced among young graduates (FA0, 2012). For instance, over 64 percent of youths were reported to be either unemployed or underemployed in 2018 (Wamajji & Mubangizi, 2022). Specifically, the increasing graduate unemployment is a major policy issue in Uganda. In response to these growing concerns, development agencies have recognised the critical importance of agriculture to the overall economic growth and poverty reduction in the country. Based on this, several agricultural employment programmes have been implemented over the years. Examples include the Youth Inspiring Youth in Agriculture

Initiative (YIYA), the Youth Empowerment through Agriculture (YETA) programme, and the ENABLE-TAAT Programme, among others.

3.3 Research Design

This study adopted a quasi-experimental research design. According to Creswell and Creswell (2017), this design is useful when true experimentation is not feasible and respondents cannot be randomly assigned to either the treatment or control group. Due to the lack of pre-programme (baseline) data, this study adopted a "With and Without" treatment approach of impact assessment which compares the outcomes of two groups with similar characteristics. Thus, the study population was stratified into two categories (treatment and control). The treatment group comprised young agripreneurs who participated in the ENABLE TAAT programme in Kenya, Nigeria, and Uganda while the control group comprised other young agripreneurs who did not participate in the programme but have similar characteristics as the participants.

One desirable attribute of this design is that it facilitates data collection from the participants and non-participants and attributes any differences between them to the assignment variable (participation). In this study, the outcomes of the participants and non-participants of the ENABLE TAAT programme were compared and estimated differences were attributed to programme participation.

3.4 Methods of Data Collection

3.4.1 Sampling Procedure and Size

The sample for this study focused on both participants and non-participants of the ENABLE-TAAT programme in Kenya, Nigeria, and Uganda. The inclusion of three countries necessitates the adoption of a cross-national sampling design. According to Kaminska and

Lynn (2017), the multi-national sample is a special case of a multiple-frame sample where more than one sampling frame is used to represent the study population. In essence, samples were independently selected in each country, using a single stratum indicator that reflects similar sampling strata within each country. Based on this, the study adopted a multi-stage sampling technique to select respondents within each of the study countries. The sampling strategy was implemented as follows:

(a) In the first stage, Kenya, Nigeria, and Uganda were purposively selected based on the three criteria discussed earlier.

(b) The second stage involves stratifying the study population into two groups; participants and non-participants, the participants being those who participated in the ENABLE-TAAT programme in 2018 and the non-participants being other young agripreneurs registered in the IITA database within the same geographical location as the participants but have never participated in any of the IITA programmes. The list of participants and non-participants specific to the three study areas, which served as the sampling frames, was obtained from the programme coordinating office in each country. Specifically, non-participants were gathered from an agripreneurs listing exercise conducted by IITA for record and programme-targeting purposes. Table 3.1 presents the sampling frame for the three countries.

Because the population of the participants and non-participants of the ENABLE-TAAT programme are known, the sample size was calculated using Yamane's (1967) formula for obtaining sample size for a known population (Equation 3.1).

Table 3. 1 Sampling Frames for Participants and Non-participants for Kenya, Nigeria, and Uganda

Country	Participants	Non-participants
Kenya	344	400
Nigeria	440	365
Uganda	600	530
Total	1384	1295

Source: ENABLE-TAAT database

$$n = N * \frac{\frac{Z^2 * p(1-p)}{e^2}}{N-1+ (\frac{Z^2 * p(1-p)}{e^2})} \quad (3.1)$$

Where: n = sample size; N = total population under study; e[4] = Margin of Error; p = Sample proportion (0.5); z = the confidence interval (1.96). Based on the sampling frames, the formula gives a sample size of 747 for participants and 716 for non-participants, giving a total of 1463 for both groups. This sample size was proportionately shared among the three countries based on each country's sampling frame (Table 3.2).

Table 3.2 Sample Size for Kenya, Nigeria, and Uganda

Country	Participants	Non-participants
Kenya	344 * 0.540 = 186	400 * 0.553 = 221
Nigeria	440 * 0.540 = 238	365 * 0.553 = 202
Uganda	600 * 0.540 = 324	530 * 0.553 = 293
Total	1384 * 0.540 = 747	1295 * 0.553 = 716

Notes: The proportion used for participants and non-participants was obtained by dividing the calculated sample size by the total population in the sampling frame (e.g., 747/1384)

(c) The third stage involves randomly selecting youths from the sampling frame of each country. For data protection and guidance, sampling from the lists was done together with

[4] An error margin of 0.025 was assumed to obtain a better representative sample

the programme managers and/or at least one representative from each Hub. The random selection of the participants and non-participants was done via random numbers generated using Microsoft Excel. Upon successful sampling, selected youths were contacted via text and phone calls to seek their consent to be a part of the survey. Due to the COVID-19 pandemic that did not permit the gathering of a large crowd at the time, a Google document was created and the link was sent to the prospective respondents to indicate their availability and preferred location for a face-to-face data collection.

A total of 1435 young agripreneurs, including 737 participants and 698 non-participants, who gave their full consent participated in the survey across the three countries. This includes 400 respondents (183 participants and 217 non-participants) from Kenya, 429 respondents (230 participants and 199 non-participants) from Nigeria, and 606 respondents (324 participants and 282 non-participants) from Uganda. Overall, this represents a 98 percent response rate which is sufficient for the analysis.

3.4.2 Data Types

The study used primary and secondary data. Specifically, quantitative data on socio-demographic, socio-economic, institutional support, agripreneurship skills, organizational factors, livelihood, and food security status was collected. Additionally, secondary data on programme design, beneficiaries, and implementation was obtained from the programme managers.

3.4.3 Data Collection Methods

Primary data was obtained using a well-structured questionnaire. Questionnaires are considered the best, most timely and most cost-effective instrument for gathering large amounts

of information. The questionnaire was designed based on previous literature on similar studies (Adeyanju *et al*., 2019; 2020; Ogunmodede *et al.,* 2021) and in consultations with the research supervisors to ensure that the solicited information aligns with the study's objectives as well as to ensure conformity to academic standards. The Questionnaire was programmed on the Open Data Kit (ODK) and data was collected using tablets and smartphones by trained enumerators.

3.5 Pilot Survey and Questionnaire Pre-testing

Prior to the main survey, a pilot survey was conducted to get more acquainted with the study areas and validate the sampling frames, sample size, and data collection tools. Also, it helped to validate how relevant the questions are to the prospective respondents and assess the most effective and efficient way to conduct the main survey. A total of 60 respondents, including 20 respondents from each country participated in the pre-testing.

CHAPTER FOUR

ASSESSING THE FOOD SECURITY STATUS OF YOUNG AGRIPRENEURS IN KENYA, NIGERIA, AND UGANDA[5]

Abstract

Food insecurity remains a serious challenge for many households in Africa and the situation is even more prevalent among young people. However, there is a dearth of empirical evidence on youth food security status in Africa. The study assessed the level and determinants of food security among young agripreneurs in Africa. A multi-stage sampling technique was adopted to select 400, 429, and 606 young farmers in Kenya, Nigeria, and Uganda, respectively. Individual food consumption was assessed following a 7-day recall method. The Food Consumption Score (FCS), which combines dietary diversity and consumption frequency was used to assess food security status while the determinants of food security were identified using a logistic regression model. Results suggest low dietary diversity across the three countries. Also, the majority of the respondents had an unacceptable food consumption score, suggesting that despite being food producers, young agripreneurs are still food insecure. The odds of being food secure were positively determined by access to extension services, participation in the ENABLE-TAAT programme, and access to market information but, negatively by access to credit, number of employees, COVID-19 pandemic, and location. Additionally, the food security status of young female agripreneurs was positively influenced by age, suggesting that younger youths are less food secure compared to older ones. These results suggest that more

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efforts should be directed toward improving the food security status of young African farmers and that policy- and programme interventions should support access to extension services and market information. Additionally, more investments should be directed toward developing need-based agribusiness incubation programmes with an effort to scale existing programmes beyond the regular one-time period.

Keywords**:** Food consumption; food security; young farmers; Kenya; Nigeria; Uganda

4.1 Introduction

One of the United Nations (UN) Sustainable Development Goals (SDGs) is to end hunger and ensure food accessibility by all people by 2030. While there have been several national and international efforts to achieve this goal, food insecurity remains a major livelihood issue in many developing countries, particularly in Africa. A report by FAO (2021) shows that approximately 21 percent of the African population experienced severe hunger in 2020, doubling the percentage reported in other regions of the World. Also, over 50 percent of the population faces moderate to severe food insecurity (Gebre, 2021; World Health Organization, 2019), representing one-third (799 million) of the estimated 2.37 billion people facing moderate to severe food insecurity in the World (FAO, 2021). Compared to other regions, the prevalence of food insecurity is higher in East and West Africa, where over 65 percent and 68 percent, respectively experience moderate to severe food insecurity (FAO, 2021).

While food security has received significant attention in the literature in recent years due to the 2030 UN agenda (Masa *et al*., 2020), existing studies seem to be skewed toward the household, with scanty evidence on young adults. According to Sithole and Dinbabo (2016), youths, defined as people between 18 and 35 years old, belong to a vulnerable group subjected to high rates of unemployment, social segregation, stigmatization, and low incomes, which affect their livelihoods and economic status. Similarly, Hadley *et al*. (2009) described youth as a forgotten population experiencing a range of social and mental issues as they transition into adult roles.

Among other livelihood issues, living without food is a serious issue that disproportionately affects young Africans (Masa *et al*., 2020), who account for about 70 percent of the African population (United Nations, 2022). This corroborates Elgar *et al*. (2021) who posit that youth

face moderate to severe food insecurity and other livelihoods, economic, and health risks resulting from the negative implications of severe food insecurity.

It is worth noting that based on the relevance of agriculture to rural economies and, consequently, the livelihood of youths, concerted efforts are being made by both national and international stakeholders to promote agricultural employment among rural youths in Africa (Adeyanju *et al*., 2021, Yami *et al*., 2019). Most of these efforts are being implemented to curb the rising rate of youth unemployment and ensure that rural youths engage in economic activities for better livelihood. For instance, the ENABLE-TAAT programme implemented by the International Institute of Tropical Agriculture (IITA) under the funding of the African Development Bank (AfDB) aims to help young farmers develop relevant agricultural and business skills to improve their livelihood and food security status.

Thus, within this context, where strategies and efforts are ongoing to improve youth livelihoods through agriculture (Adeyanju *et al*., 2021; Yami *et al*., 2019), it is important to assess their food consumption to ensure that their food security is also being addressed. This is because, compared to other categories of the population, food insecurity can be quite tough on young people transitioning from adolescence into "emerging adulthood" (Larson *et al*., 2020). This is supported by Acheampong *et al*. (2022) who posit that farmers in rural areas experience heightened food insecurity and hunger despite growing and marketing food crops.

Though studies have been conducted on youth food security in Africa, the bulk of available pieces of literature focus mostly on children, university students, and other socially vulnerable groups (Davidson & Morrell, 2020; Larson *et al*., 2020; Leung *et al*., 2019; Loftus *et al*., 2021; McArthur *et al*., 2018; Ragasa *et al*., 2019; Tong *et al*., 2019) while studies on the food security

status of young agripreneurs or farmers are quite limited. The evidence that has been presented so far does not give grounds for adequate policy decisions on young African agripreneurs. This is because studies that considered young farmers across Africa are quite hard to find. Specifically, there is very limited peer-reviewed research on the level and determinants of food security among young farmers in developing countries. This highlights an evidence gap in a region where youths are more likely than adults to lack timely access to food (Masa *et al*., 2020).

Thus, it is imperative to empirically understand the depth and factors influencing food security among young farmers from a demographic perspective to ensure that they are continuously being captured in food security debates. Furthermore, this evidence is important to dissociate youths enrolled in schooling from those engaged in economic activities since the latter may be less dependent on family members for their basic needs (Masa *et al*., 2020). Also, this evidence will inform timely and appropriate targeting of vulnerable youths and identify the unique factors to consider to reduce food insecurity among young people.

This study aims to generate empirical evidence that could guide policymakers and relevant stakeholders in addressing food insecurity among young farmers in Africa. Specifically, the study seeks to answer the following questions: 1. Do young farmers in Africa face food insecurity? 2. What are the determinants of food security among young African farmers? Also, the study focused on gaining new insight into youths' food choices and sources while comparing these with the household consumption patterns found in other studies.

For better insights, the result was disaggregated by gender to assess the common and different factors that influence food security among young male and female farmers. In answering these

questions, the study adopted the World Food Programme's (WFP) Food Consumption Score (FCS) based on the consumption frequency of specific food groups weighted based on their respective nutritional importance. Also, the factors influencing food security were identified using a logistic regression model. The results show high consumption of starchy and fatty/oily foods against proteinous foods during the 7-day recall period, suggesting low dietary diversity which could be a result of high reliance on own production and rising food prices.

Also, despite their engagement in food production, the results show that food insecurity was high among the youths, with the highest prevalence in Uganda. Among other factors, participation in agribusiness programmes, access to extension services, credit, and market information were correlated with food security. This implies that efforts to improve the food security status of young farmers must consider these factors for better outcomes. These results have clear implications for youth food security debates and policy, especially during this period of multi-faceted economic crisis and youth bulge.

4.1.1 Conceptualizing Food Security

Within the context of this study, food security exists "when young people, at all times, have physical, social, and economic access to sufficient, safe, and nutritious food that meet their dietary needs and food preferences for an active and healthy life" (FAO, 2009, p. 1). This definition identifies four major dimensions of food security including availability, access, affordability, and utilization. Food availability denotes having sufficient food in both formal and informal markets that meet both individual and market demand. This also entails raising food production locally and through imports.

Food accessibility entails having enough resources to acquire sufficient foods needed for a nutritious diet (Acheampong *et al*., 2022). This entails an individual's ability to obtain their food need on a timely and regular basis. In the case of smallholder farmers, food access is mostly facilitated through their own production, gifts, exchange, borrowing, food aid, and purchase. Evidence abounds that the majority of smallholder farmers largely depend on their own production which could limit their access to other food items they don't produce (Huang & Tian, 2019; Nchanji & Lutomia, 2021).

Food utilization entails how individuals or households use the food items available and accessible to them while food stability encompasses the other three dimensions, looking at steady availability, accessibility, and utilization of food at all times (Acheampong *et al*., 2022). According to van Meijl *et al*. (2020), beyond quantity available, financial and physical accessibility coupled with better processing and preparation methods are equally important.

While there is a consensus on the concept of food security, it has remained difficult to define a common metric and common factors influencing food insecurity across various countries, population categories, and age groups (Smith *et al*., 2017). This is because the root causes of food insecurity are multidimensional and difficult to understand, particularly in Africa (Kansiime *et al*., 2021), thereby raising the need to understand the depth and determinants of food (in)security across different ages and population categories (Wieck *et al*., 2014).

According to Matavel *et al*. (2022), an important component of achieving food security is the identification of individuals or households that are food insecure and characterizing the nature of the insecurity via measurements that can provide a basis for monitoring the progress and impact of food security efforts. The current study aims to fill this research gap by assessing the

food security status and identifying factors affecting food security among young African farmers. In achieving this, the WFP's FCS was adopted to measure food security based on its ability to accurately capture dietary diversity which is important to facilitate policy debates on youth food security.

4.1.2 Determinants of Food Security Among Young Farmers in Africa

According to Masa *et al*. (2020), the research gap on youth food insecurity in Africa could be linked to various factors, including limited relevant data and validated measures. While economic factors such as farm production and income are commonly linked to food security (Mulwa & Kabubo-Mariara, 2022), this approach has been criticized since income is highly variable for those engaged in farming activities, suggesting a need to capture other relevant correlates such as socioeconomic, demographic, and institutional factors to inform effective targeting and practical policy on youth food security. For instance, some studies have found a significant link between food security and gender, social capital, and empowerment programmes (Devereux *et al*., 2020; George *et al*., 2020; Larson *et al*., 2019; Sseguya *et al*., 2018).

According to Masa *et al*. (2020), the heterogeneity of the youth population depicts different physical, economic, and social attributes which could invariably influence their food security status in ways that differ from adults and other vulnerable groups. The authors argued that while youth in the lower age category (aged 15 -18 years) may depend on their parents or family members for food, the older ones are more likely to be less dependent, suggesting the need to examine the relevant factors influencing food security among this category of the population.

Also, in identifying these factors, it is equally important to consider their influence from a gender perspective since food allocation may be skewed against young women, resulting in a less diverse diet or smaller portions (Aurino, 2017). In essence, young women may be at risk of severe food insecurity compared to their male counterparts. This is supported by Harris-Fry *et al*. (2018) who attribute the gender bias in food allocation to varying degrees of resources at an individual or household's disposal. Thus, in addition to identifying factors that influence food security among young farmers, the study assessed whether significant socioeconomic correlates of food security varied by gender.

4.2 Materials and Methods

4.2.1 Empirical model

One of this study's objectives is to identify factors that determine food security among rural young farmers in Africa. Thus, the primary focus is on assessing whether a young farmer has an acceptable FCS or not. On this note, the FCS was re-grouped into two, with the poor and borderline categories deemed unacceptable. As a result, the outcome variable, FSC, is a dichotomous one, classified as acceptable (assigned a numeric value of 1) and unacceptable (assigned a numeric value of 0). Based on this dichotomy nature of the outcome variable, the determinants of food consumption were identified using a logistic regression model presented in Equation 4.1:

$$y_i = \alpha_i x_i + e_i \tag{4.1}$$

Where $y_i = \begin{cases} 1 = Acceptable\ FCS \\ 0 = Unacceptable\ FCS \end{cases}$

The outcome is believed to be influenced by a vector of explanatory variables x_i; $\alpha_i$denotes a vector of parameters to be estimated; and e_i is the error term.

The assumption is that the probability of y_i assuming the value of 0 and 1 is $1 - P_i$ and P_i respectively.

Where:

$$P_i = \frac{e^y}{1+ e^y} \tag{4.2}$$

The marginal effects of explanatory variables can be estimated as specified in Equation (4.3):

$$\beta_{m.e.} = [{}^{\partial(\alpha_i x_i + e_i)}\Big/_{\partial(\alpha_i x_i)}]\beta_i \tag{4.3}$$

The selection of the variables included in the logit model was guided by relevant studies, including Davidson and Morrell (2020), Feleke *et al*. (2005); Ngema *et al*. (2018), Nkomoki *et al*. (2019), Tong *et al*., (2019), and Usman and Callo-Concha (2021). These variables, their measurements, and hypothesized direction are presented in Appendix 4A

4.2.2 Data

This study used the Youth in Agriculture Survey (YAS) data collected under the 'ENABLE-TAAT' project[6] funded by the African Development Bank (AfBD) and facilitated by the International Institute of Tropical Agriculture (IITA). The survey was conducted in Kenya, Nigeria, and Uganda between August – December 2021. The study adopted a cross-national sampling design following Kaminska and Lynn (2017). Thus, different sampling frames were

[6] The ENABLE-TAAT programme was implemented across 19 African countries with the aim of involving youth in the process of agricultural transformation and improving their capacities in different agricultural value chains. Another key objective was to improve youths' food security status and nutrition by promoting better practices and adoption of improved crop varieties among young farmers.

used in selecting the respondents in each country. In essence, samples were independently selected in each country, using a single stratum indicator that reflects the same sampling strata within each country.

To obtain a random sample, a multi-stage stratified random sampling technique was adopted in selecting the respondents. The first stage involves the purposive selection of three countries out of the seven countries in which the ENABLE-TAAT programme was conducted in 2018. The choice of these countries was based on the high number of young farmers who participated in the programme compared to the other countries in which the programme was implemented in the pilot year (2018), their ranks in the level of youth unemployment and poverty among the project countries, and the advanced level of stakeholder engagement with IITA in youth agribusiness development in Africa. Also, the sample was stratified into two groups, including participants and non-participants of the ENABLE-TAAT programme.

Then, youths were randomly from the sample frames to make a sample size of 1463, following Yamane (1967). The sampling frame for each country consisted of a complete list of young farmers registered in the database of the ENABLE-TAAT programme in the reference year which included 744, 805, and 1130 young farmers in Kenya, Nigeria, and Uganda, respectively. The sample size for each country was determined based on probability proportional to size giving a sample size of 408, 441, and 614 for Kenya, Nigeria, and Uganda, respectively. Finally, the random selection of the respondents was done using random numbers generated via Microsoft Excel.

A total of 1435 young farmers fully participated in the survey across the three countries. Out of this, responses were obtained from 400, 429, and 606 respondents in Kenya, Nigeria, and

Uganda, respectively, representing a 98 percent response rate which is sufficient for the analysis. The missing 2 percent was due to some individuals' refusal to complete the survey. The selected youths were interviewed face-to-face by trained enumerators with a well-structured questionnaire programmed on the Open Data Kit (ODK), which was carefully designed and pre-tested before the main survey. In addition to demographic and farm-level data, data on various food items, sources, and consumption patterns were collected.

Food consumption was captured through a 7-day recall recommended by WFP. Specifically, the youths were asked how frequently (in days) they consumed specified food items in the last 7 days preceding the survey. Also, respondents were requested to indicate their current residence, and results showed that responses were skewed towards rural areas across the three countries. This further indicates the importance of agriculture to rural youths (Cousins *et al*., 2018; Sithole & Dinbabo, 2016).

4.2.3 Measurement of Food Consumption Score (FCS)

The FCS also referred to as a "food frequency indicator," is a frequency-weighted diet diversity score calculated using the consumption frequency of eight food groups, including main staples, pulses, vegetables, fruit, meat and fish, milk, sugar, and oil, over a 7-day recall period (Wiesmann *et al*., 2009). It indicates the dietary diversity, consumption frequency, and sources of these food items. In this study, the FCS was constructed using the information on food consumption gathered from a country-specific list of food items. The relevance of these food items to food security has been widely discussed in the literature (Brouns *et al*., 2019; Fukagawa & Ziska, 2019; Poole *et al*., 2021).

While some food items such as cereal grains are common staples that are easily accessible and affordable by many Africans (Brouns *et al*., 2019; Fukagawa & Ziska, 2019; Poole *et al*., 2021), other items such as exotic fruits and dairy products are quite expensive and rarely found in African diet. For instance, Fukagawa and Ziska (2019) document that over 20 percent of the world's calories come from rice while cereal grains provide the world's population with the most accessible and affordable macronutrients (energy and protein). However, sustainable food security cannot be actualized by depending on just a few crops (Aworh, 2023).

In this study, respondents were asked how many days they had consumed different food items in the week before the survey. These food items were grouped into eight specific food categories, as presented in Table 4.1. The consumption frequencies of the eight groups were summed, and any frequency value above seven was capped at seven.

Table 4.1 Food Groups and Weight Used in Constructing the FCS

Food Items	Food Groups	Weight
Maize, rice, pasta, bread, and other cereals	Cereals and Tubers	2
Cassava, Yam, Arrow roots/Cocoyam, and potatoes		
Vegetables and leaves	Vegetables	1
Fruits	Fruit	1
Beef, goat meat, poultry, pork, eggs, fish, other meat, and seafood	Animal protein	4
Beans, peas, lentils, peanuts, and others	Pulses	3
Milk and other milk products	Milk	4
Sugar, honey, and sugar products	Sugar	0.5
Edible oils, fats, and butter	Oil	0.5

Source: United Nations World Food Programme (2008)

Next, the frequency obtained for each food group was multiplied by an assigned weight (see Table 4.1) that is based on its nutrient content. Finally, the FCS was computed as the sum of the weighted values of all the food groups. This method of assessing food consumption has been adopted to compute individual and household food consumption by many studies in developing countries (Aweke *et al*., 2021; Blekking *et al.,* 2021; de Menezes-Júnior *et al*., 2022; Fite *et al*., 2022; Sekaran *et al.,* 2021). The formula used in computing the food consumption score is presented in Equation 4.4:

$$\text{FCS} = \Sigma F_i X_i \tag{4.4}$$

where F_i represents the different food groups, and i is the different food items. X_i denotes the consumption frequency of each food group over the past seven days. Finally, the continuous FCS was categorized into suitable food consumption thresholds as follows: acceptable food consumption (FCS >42), borderline (FCS = 28.5 – 42), and poor food consumption (FCS = 0 – 28) following United Nations World Food Programme (2008).

4.3 Results and Discussions

4.3.1 Descriptive Results

The descriptive results of the variables included in the logit model are presented in Table 4.2. Generally, the average age of the respondents was about 29 years. Similar results were obtained for Kenya and Nigeria, while the mean age for the Uganda respondents was 27 years. This shows that most of the respondents belong to the older youth category (Gardner *et al*., 2015) and hence, are in their economically productive years. Over half of the respondents are male, suggesting a gender balance among the respondents. Even though this was not pre-determined, it could be attributed to the promotion of women empowerment in many African countries and

the deliberate focus of the ENABLE TAAT programme on more young women engaged in agriculture.

Table 4.2 Socio-economic and Demographic Characteristics of Youths in Kenya, Nigeria, and Uganda

Variable	Pooled n = 1435	Kenya n = 400	Nigeria n = 429	Uganda N=606
Age of Respondents (years)	28.50	29.04	29.59	27.38
Education (years)	14.21	13.74	15.61	13.52
Household Size	4.96	5.15	4.78	4.95
Land size (Ha)	2.14	2.34	1.88	2.18
Number of employees	4.06	3.69	4.06	4.24
Number of young employees	3.44	3.04	3.64	3.52
Farming Experience (years)	3.41	3.06	3.16	3.823
Value of productive assets	1886.15	2183.74	1095.19	2249.65
Gender (Male)	57.35	55.50	66.90	51.82
Access to credit (%)	39.86	21.75	20.98	65.18
Access to extension services (%)	60.56	59.75	59.44	61.88
Access to market (%)	62.65	62.50	62.70	62.71
Residence (Rural)	73.59	94.00	32.87	88.94
Sole business ownership (%)	80.91	88.75	80.89	75.74
Access to training (%)	51.36	45.75	53.61	53.47
Asset ownership (%)	94.84	96.25	97.90	91.75
Part-time engagement in farming (%)	21.95	22.00	23.54	20.79
Affected by Covid-19 (%)	73.80	69.25	73.19	77.23

By country, the respondents from Nigeria had two additional years of formal education than those from the other two countries. However, this could be attributed to the educational system of different countries. Overall, the results imply that a larger proportion of the respondents had between 14 and 16 years of schooling. This is not surprising since the respondents are from a

list of young graduate farmers. The pooled-mean household size, defined by the number of persons that live and dine with a respondent, was 5 persons. Other studies have shown that the average household size in Africa is between 5 and 7 persons (Makwinja *et al*., 2021; Nwosu *et al*., 2020; Omara *et al*., 2021). The result also indicates that respondents across the three countries had an average farmland of 2 hectares, suggesting that young farmers engaged in food production operate on small farmlands which could be a result of limited access to land. This is well documented in literature as one of the significant factors affecting the performance of youth-owned agro-enterprises (Adeyanju *et al*., 2021; Ricker-Gilbert & Chamberlin, 2018; Yeboah *et al*., 2020).

In addition, the number of employees hired by respondents in the three countries was almost the same, with an average of about four employees. The results also show that three-quarters of those hired were youth, which could suggest youth prefer to hire their peers. This employment preference could be because they share common features and can relate better with their peers than adults. While this is not the focus of this study, the results suggest a trend in peer-to-peer employment which could have notable implications for reducing youth unemployment in Africa. Except for Uganda with more years of experience by 1 year, respondents from Kenya and Nigeria had about 3 years of farming experience. This suggests that they are operating within the growth stage of agribusiness and are likely to have a strong customer base. It also appears that the majority of the respondents started their agribusinesses after participating in the ENABLE TAAT programme, indicating the relevance of agribusiness empowerment programmes in stirring the intention of young graduates to engage in agriculture.

Access to credit was quite low among the respondents in Kenya and Nigeria (22 percent and 21 percent, respectively), which could be attributed to the lack of creditworthiness among

young people (Buszko *et al*., 2020; Ndagijimana *et al*., 2018). However, contrary to some studies conducted in Uganda (Bukuluki *et al*., 2020; Mulume *et al*., 2022), more respondents in Uganda (65 percent) had access to credit. This could be because they had relatively more years of farming experience or could be a result of the recent efforts by the Ugandan government to facilitate youth access to affordable credit (Gunewardena & Seck, 2020).

The majority of the respondents (60 percent and 63 percent, respectively) had access to extension services and markets. Differences were not found in individual countries regarding access to extension and markets. Compared to Nigeria, where only one-third of the respondents reside in rural areas, most of the respondents in Kenya and Uganda (94 percent and 90 percent, respectively) are domiciled in rural areas, indicating some demographic similarities between the eastern countries. The result obtained for Nigeria is, however, not surprising considering the degree of rural-urban migration and the growth of innovative farming such as soilless farming in Nigeria in recent years (Olubanjo & Alade, 2018; Ovharhe *et al*., 2020).

Except for Kenya where less than half of the respondents had access to training, over half of the respondents from the other countries had accessed training in the last 12 months. Nearly all the respondents had productive assets worth an average of 1886 USD. This shows a considerable level of asset ownership which could be an important factor for food consumption. This is because more assets could increase production and income, thereby helping to smoothen food consumption. Less than one-fourth (<25 percent) of the respondents had other forms of employment, implying that the majority are solely dependent on agricultural employment. Engagement in other forms of employment implies that productive time is shared between different activities. The implication is that, while an additional source of income could add to total income, the time allocated to agricultural activities is reduced, thereby reducing outputs

and subsequently, farm income. Considering that most farmers consume their own-produced food, reduced output could reduce food consumption.

Because of the recent COVID-19 pandemic, this study captured the effect of the pandemic on agricultural activities and performance. While the level and nature of the impact differ, nearly all the respondents indicated that the COVID-19 pandemic affected their agricultural activities and performance through the measures adopted to curtail the pandemic. This is consistent with an emerging body of literature that has documented the impact of the Covid-19 pandemic on economic activities and food security (Amare *et al*., 2021; Ayanlade & Radeny, 2020; Davila *et al*., 2021; Stephens *et al*., 2020; World Bank, 2020).

4.3.2 Young Farmers' Dietary Diversity

Figure 4.1 shows that fats and oils were the most consumed by respondents across the three countries. This corroborates Shim *et al*. (2021) who attribute the high consumption of fatty foods to low cost and minimal preparation time which often lead to overconsumption. Cereals and tubers were consumed every day by 86 percent of the respondents in the 7-day recall period across the three countries. This could be because food items in this category are mostly farm-sourced and readily available through their own production. The results also revealed that pulses and fruits, respectively were the least-consumed food groups, by only 2 percent and 4 percent of the respondents during the 7-day recall period. This corroborates Workicho *et al*. (2016) who associated the low consumption of fruits among Ethiopian farmers with limited access to diet diversity markets and the associated cost of purchasing these items since smallholders' production is centred around staples and livestock production.

Similarly, Acheampong *et al*. (2022) found that the consumption of pulses and fruits was not as common as roots and tubers, and cereals among farming households in Ghana. Also, the

results indicate that 42 percent, 27 percent, and 51 percent had no vegetables, animal proteins (Fish and Meat), and milk and dairy products during the recall period. The pattern shown in these Figures aligns with the popular opinion that Africa's diet is primarily composed of carbohydrates and oils, with starch predominating over proteins. This raises a key concern that most African youths seem to lack some important nutrients present in proteinous foods and also question their knowledge of dietary diversity.

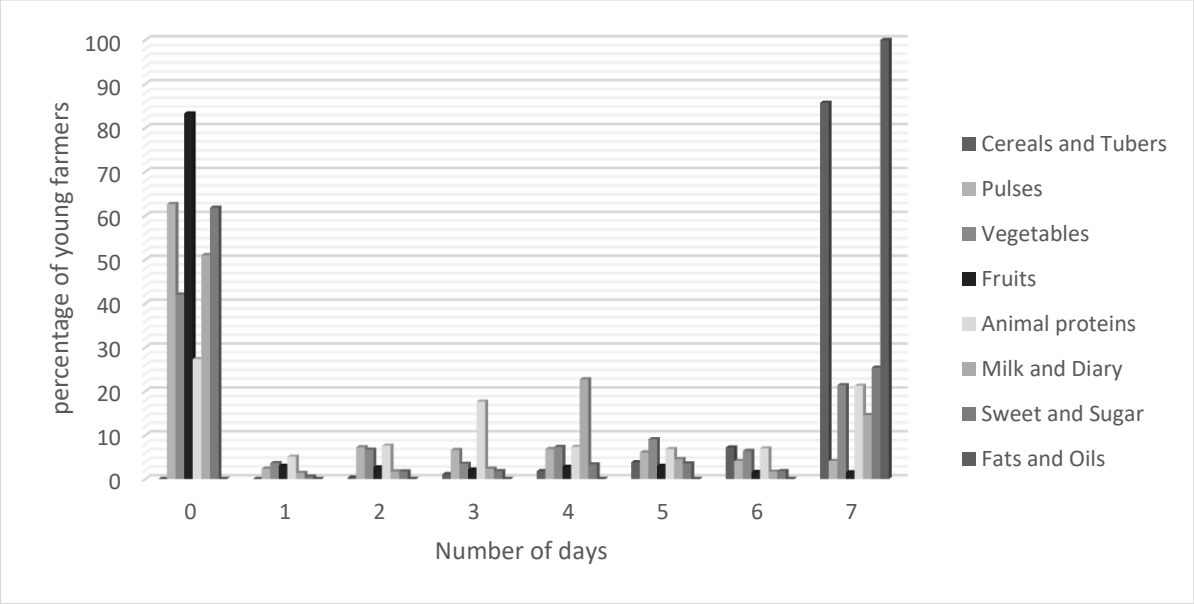

Figure 4. 1. Youth Consumption of Different Food Groups Over a 7-day Recall Period

Data presented in Figure 4.2 show a similar trend in each of the study countries, indicating that the African food system consists largely of cereals and root crops which form a larger part of individual diets. Also, the consumption of fruits was very low in each of the countries. Milk consumption was relatively high in Kenya compared to the other countries, where all the respondents consumed milk and dairy products at least once in the 7-day recall period. This could be because milk production is high in Kenya compared to other countries. Consumption of animal protein was high in Nigeria where all the respondents equally reported consumption at least once in the recall period. These results suggest that food consumption among the

respondents is skewed towards cereals and tubers and consumption of varied diets, which is a key strategy to attaining nutritional requirements is poor.

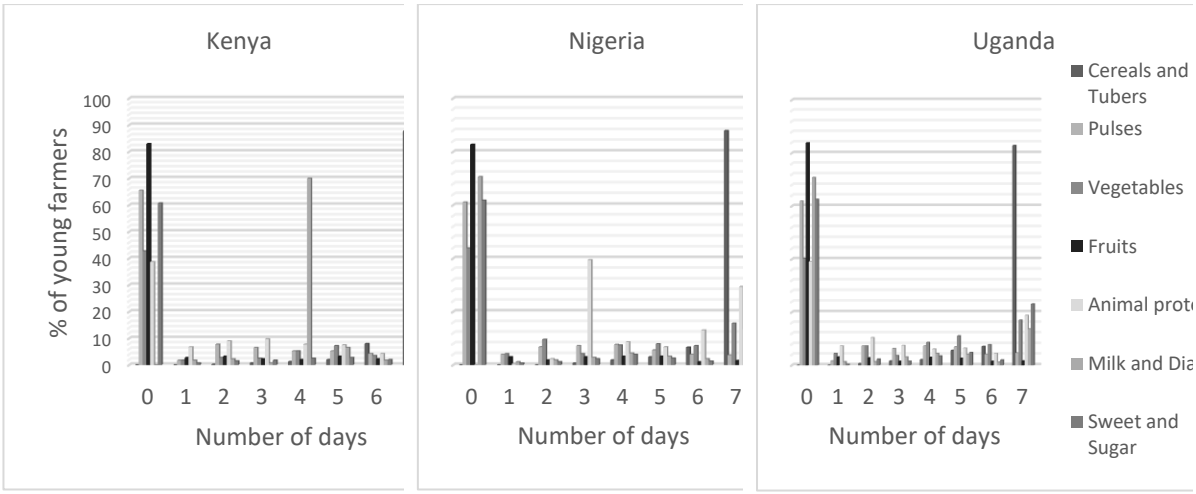

Figure 4. 2. Food Consumption Among Youths in Kenya, Nigeria, Uganda

4.3.3 Food Consumption Score

Table 4.3 presents the average food consumption scores (FCS) and respondents' profiles by country.

Table 4.3 Categorization of Food Consumption Scores Recorded by Youths in Kenya, Nigeria, and Uganda

Food Consumption profile	Pooled n = 1435	Kenya n = 400	Nigeria n = 429	Uganda n=606
Average food consumption score (mean)	45.15	51.32	47.64	39.32
Poor Food Consumption (%)	13.24	0.00	0.93	30.69
Borderline Food Consumption (%)	38.75	39.00	48.48	31.68
Acceptable Food Consumption (%)	48.01	61.00	50.58	37.62

The results show that less than half (48 percent) of the youths across the three countries were within the acceptable FCS, suggesting that despite their engagement in food production, the majority of young farmers in Africa are still food insecure. Interestingly, different results were obtained in each country. While the majority of respondents in Kenya and Nigeria (61 percent and 51 percent, respectively) had acceptable FCS, only a little above one-third (38 percent) had acceptable FCS in Uganda. Although there was a substantial number (39 percent) of youths on the borderline FCS group across the countries, Nigeria had the highest number with 48 percent.

Overall, food insecurity was highest among the respondents in Uganda corroborating other studies that have found low food consumption among young people in developing countries (Bhawra *et al*., 2021; Cady, 2014). The relatively high FCS obtained among the respondents in Nigeria could be attributed to crop diversity and favorable climate conditions in terms of rainfall and temperature compared to the other countries. Nigerian farmers are more likely to cultivate diversified crop varieties that contribute to food security. Even though the food consumption disparity between the two East African countries is surprising, it could be attributed to differences in food choices (for instance, high milk and dairy product consumption in Kenya) and Kenya being the hub of East Africa's economic activities.

Generally, despite being food producers, about 52 percent of the respondents across the three countries were found to be food insecure. This corroborates Masa *et al*. (2020) who found that more than half of African youths experience moderate to severe food insecurity and Acheampong *et al*. (2022) who found that despite being food producers and marketers, farmers still experience food insecurity in Africa.

Holistically, these figures are lower than the household values in other studies (Akuffo & Quagrainie, 2019; Tuholske *et al*., 2020), suggesting that food insecurity is higher among young people compared to taking the household as a unit. This further explains why measuring food consumption at the individual level is relevant against the regular household approach. The approximately 52 percent found outside the acceptable food consumption category, despite living above the poverty line as indicated in the income data, suggests that income may not be a strong proxy for food security as hypothesized by some studies (e.g., Dunga, 2020) since increased income may be directed to other needs such as purchasing assets, instead of food. This, however, necessitates concerted efforts towards improving individual food security status, particularly that of neglected vulnerable groups such as youths.

4.3.4 Determinants of Food Security Among Youth in Kenya, Nigeria, and Uganda

The factors influencing food security among young farmers are presented in Table 4.4. The data was aggregated for ease of analysis and interpretation. Also, for better insights into gender disparities, the analysis was disaggregated by gender, identifying common and different factors that affect each gender group. The result of the Hosmer and Lemeshow chi-square test conducted to test for the model's goodness of fit suggests that the model is well-fitted since the p-value was insignificant and greater than 0.05 (p-value=0.5491). Also, the test for multicollinearity shows no strong correlation between the variables included in the model. In addition, the c-statistics from the ROC curve was over 0.7 (Appendix 4B), indicating that the model has predictive power.

Out of the fifteen explanatory variables included in the model, nine were found to be significant in determining food security for the pooled sample. These variables include access to extension

service, credit, participation in the ENABLE-TAAT programme, having employees, access to the market, and asset ownership.

Table 4.4 Determinants of Food Consumption Among the Youths in Kenya, Nigeria, and Uganda

Variables	M.E.	S.E.	M.E.	S.E.	M.E.	S.E.
	Pooled= 1435		Male= 823		Female=612	
Extension Service	0.160***	0.080	0.150***	0.106	0.170***	0.124
Gender	0.004	0.071				
Credit	-0.124***	0.087	-0.138***	0.119	-0.119***	0.131
(Log)Age	0.030	0.219	-0.135	0.305	0.220**	0.323
Education	0.019	0.060	0.034	0.082	0.006	0.092
(Log)Household size	0.044	0.079	0.036	0.103	0.051	0.130
Residence	-0.012	0.061	-0.030	0.079	0.020	0.102
Ownership	0.040	0.090	0.030	0.131	0.051	0.128
ENABLE TAAT	0.105***	0.078	0.100***	0.104	0.103**	0.122
Employees	-0.059**	0.075	-0.026	0.099	-0.113***	0.118
Market Information	0.197***	0.079	0.198***	0.104	0.201***	0.125
Asset ownership	0.084	0.161	0.054	0.224	0.111	0.238
Covid19	-0.071**	0.080	-0.029	0.108	-0.120***	0.123
Land size	0.002	0.015	-0.004	0.020	0.013	0.027
(Log)Farm Income	0.034	0.104	0.029	0.128	0.055	0.186
Country dummies						
Kenya	-0.079***	0.047	-0.100***	0.066	-0.053*	0.069
Nigeria	-0.119***	0.107	-0.097***	0.136	-0.141**	0.181
Uganda	-0.162***	0.094	-0.205***	0.131	-0.109**	0.139
Constant	-1.620	1.065	0.186	1.373	-4.120**	1.785

Notes: ME = Marginal Effects; S.E. = Standard Error; ***. **, and * denote statistical significance at 1%, 5%, 10%

For the gender-disaggregated analysis, four variables, including extension services, credit, participation in the ENABLE TAAT business incubation programme, and market access were

significant for males while ten variables, including those that were significant for the pooled sample with the addition of age, farm income, and the COVID-19 variable were significant for female. The marginal effects of each independent variable are presented and discussed in this section.

Access to extension services was positively and significantly (at $p<0.01$) correlated with having an acceptable FCS. The value of the marginal effect implies that, for the pooled sample, having access to extension services increases the likelihood of being food secure by 16 percent. This could be attributed to the role of extension in linking young farmers to innovative opportunities that could help them profitably and sustainably run their enterprises. Access to such opportunities could also have a spill-over effect on their productivity. Similar results were obtained for both the male and female groups. Among the male and female respondents, access to extension services increased the likelihood of being food secure by 15 percent and 17 percent, respectively. The larger effect obtained for female respondents has insightful extension-targeting implications since they are home caregivers and tend to be more concerned about food security issues than men. These results align with previous studies (Pan *et al*., 2018; Tesfaye *et al*., 2008; Yusuf *et al*., 2015), except for Ragasa *et al*. (2019), who found similar results for the pooled and male sample but an insignificant correlation for the female group.

Access to credit negatively and significantly (at $p<0.01$) influenced the probability of being food secure, implying that those who had borrowed money in the last 12 months are less likely to have acceptable food consumption scores and, subsequently, likely to be more food insecure. Even though this is not expected since credit is expected to raise production and contradicts some literature where credit support is shown as fundamental to promoting household food

security (Aidoo *et al*., 2013; Iftikhar & Mahmood, 2017; Matchaya & Chilonda, 2012), the results could be attributed to the lack of creditworthiness among young farmers, who would most likely explore informal credit sources with high-interest rates and ridiculous repayment conditions. This also corroborates Ngema *et al*. (2018), who argued that higher loan repayment rates may necessitate households/individuals to lower consumption. However, the result corroborates Acheampong *et al*. (2022) who explained that farmers who have access to credit may not spend on food consumption and farming activities but, use it for other pressing issues such as purchasing assets, seeking health care, etc. Accessing this from a gendered perspective, increased access to credit; otherwise, borrowing reduced the consumption scores of both male and female respondents.

Participation in agribusiness empowerment programmes such as ENABLE-TAAT was found to be positively and significantly ($p<0.01$) correlated with the likelihood of being food secure. Similar results were obtained in the other two contexts considered (gendered perspective). This suggests that participation in empowerment programmes increases the likelihood that a respondent, either male or female, will have an acceptable FCS. This could be attributed to the technical support and continuous mentorship from the programme and its focus on improving the food security status of young farmers through skills development and capacity building. This corroborates Garbero and Jäckering (2021), who found that agricultural programmes improve the food security status of beneficiaries, especially for those residing in food-insecure countries.

Contrary to prior expectations, having employees negatively and significantly influenced the likelihood of being food secure. The value and direction of the marginal effect imply that having employees reduce the likelihood of having an acceptable FCS by 6 percent. Even though

more labour/employees are expected to raise output and productivity, the negative influence could be attributed to the additional cost incurred on wages and salaries. In cases where an increased number of employees does not translate into increased output or income, young farmers could experience adverse economic outcomes that may influence their food consumption. Alternatively, this may also be attributed to farmers' scale of operation. While this factor was insignificant for the male category, a significant result was obtained for the female group. Yusuf *et al*. (2015) also found similar results among urban farming households in Nigeria.

Following the marginal effects, access to the market increased the probability of being food secure by 20 percent for the pooled, male, and female samples, respectively. Access to market information, particularly the input market, may aid the adoption of improved inputs and better services that could contribute to increased production and income. This corroborates Ogunniyi *et al*. (2021) and Tesfamariam *et al*. (2018), who attribute improved food security to the positive effect of market information. This, however, contradicts Usman and Callo-Concha (2021), who found no significant relationship between household food security and market access, instead, market access encouraged smallholder households to rely less on their own production to improve household consumption diversity.

According to the results, the pandemic reduced the likelihood of being food secure by 7 percent and 12 percent, respectively for the pooled and female groups. This is in line with several studies that have discussed the negative effects of the pandemic on farming households. The significance of this variable suggests that female respondents were more affected by the COVID-19 restrictions than their male counterparts since it was insignificant for the male respondents.

With regards to location, the results showed that the likelihood of food insecurity was significantly associated with all the countries with a higher likelihood among respondents in Uganda (16 percent higher likelihood). This is not surprising as young Africans are more susceptible to food insecurity. Similar results were obtained for the three groups (pooled, female, and male) considered. This implies that, regardless of their location, young male and female African farmers are faced with the challenge of food insecurity.

Aside from the ones discussed so far, the analysis showed that one other factor determined food consumption among the female group. Age was positive and significant at $p < 0.0\ 5$, indicating that older youths are more likely to be food secure. The marginal effect suggests that an increase in age by 1 year led to a 22 percent increase in the likelihood of being food secure.

CHAPTER FIVE

ASSESSING THE DETERMINANTS OF YOUTH PARTICIPATION IN THE ENABLE-TAAT PROGRAMME IN KENYA, NIGERIA, AND UGANDA[7]

Abstract

In the face of rising unemployment and poverty levels, an increasing number of educated youths who would ordinarily prefer formal employment are gradually turning to agribusiness for livelihood. Considering these changing employment dynamics, this study investigated young graduates' motivation to engage in agribusiness and their career preferences. Further, the study identified the determinants of youth participation in agribusiness empowerment programmes taking evidence from the ENABLE programme in Africa. A multi-stage sampling technique was adopted to select 1435 young agripreneurs, comprising 737 programme participants and 698 non-participants in Kenya, Nigeria, and Uganda. Data were analyzed using descriptive and inferential analysis. The results show that most university graduates join agribusiness based on six major reasons: (1) lack of employment opportunities (2) lack of alternative income sources, 3) income diversification, 4) family business, 5) encouragement from peers, and 6) access to agribusiness resources. Compared to formal employment and business in other sectors, the majority of the respondents indicated their preference and willingness to remain in agribusiness employment. The results also showed that certain technical, financial, and market-related issues limit youth agribusiness performance. While

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participation in agribusiness empowerment programmes can improve business performance, youths' decision to participate in these programmes was significantly influenced by their perceptions and ownership of productive assets. These results highlight the need for deliberate efforts to empower educated youths in agribusiness while developing strategies to improve their perceptions of agribusiness programmes.

Keywords: Youth unemployment; Agribusiness; Young graduates; Agribusiness empowerment; Kenya; Nigeria; Uganda.

5.1 Introduction

Africa's youth bulge has become a demographic plague that consistently fuels youth unemployment and underemployment (Metelerkamp *et al*., 2019; Omoju & Abraham, 2014; Weber, 2019), declining economic growth, food insecurity, poverty, and rural-urban migration (Baah-Boateng, 2016; Muchemwa, 2019). According to the International Labour Office (2020), Africa experienced over 9 percent increase in the youth unemployment rate in 2019 and over 23 percent decline in the Youth Employment to Population Ratio (EPR) between 1999 and 2019. With a current value that is about 1.8 times below that of adults, the EPR is further expected to decline by 0.1 percent by 2023 due to a continued decrease in labour force participation resulting from limited employment opportunities in the formal sector.

Notably, graduate youth unemployment and underemployment are pronounced and severe in Africa (Chigbu & Nekhwevha, 2021; Chitema, 2020), largely due to limited opportunities for self-development and employment within the formal sector (IFAD, 2019; Mueller & Thurlow, 2019). For instance, tertiary institutions in Nigeria and Kenya release over half a million graduates to the labour market annually, but less than 50 percent can secure sustainable employment (Hall, 2017; Kazeem, 2016). This low labour market absorption rate has left over 60 percent of the nearly 420 million youth in the continent discouraged and jobless, about one in three vulnerably employed, and less than two-fifths in wage employment (AfDB, 2016).

The COVID-19 pandemic further led to a drastic reduction in economic activities and displaced over 25 percent of all jobs (Demena *et al*., 2022; Singh *et al*., 2022), thereby exacerbating youth unemployment and underemployment which endangers their well-being, and more broadly, the economic and social stability of their immediate communities (FAO & ECA, 2018; World Bank, 2011).

These ongoing issues have led to a growing demand for urgent policy- and programme-level interventions to curb unemployment and its accordant undesirable outcomes, particularly among young graduates (Unnikrishnan *et al*., 2022). Given the current spatial distribution of youth across the rural-urban divide (over 55 percent live in rural areas), agriculture is being recognized as one of the sectors with the greatest potential to drive youth employment in Africa (Stecklov & Menashe-Oren, 2019). According to Filmer and Fox (2014), the rural economy – built around agriculture, but encompassing much more – can generate sustainable jobs for many African youth in the coming decades.

An essential component of the argument is that rural areas where transformational processes are rooted will most likely provide diverse farm and non-farm employment opportunities for young people provided enough investment is directed towards it (Yami *et al*., 2019; Yeboah *et al*., 2020). Another essential component is that while Africa's youth bulge presents a challenge, it could be an opportunity for agricultural transformation and rural development. The theory holds that a young and well-educated workforce may encourage the use of more sophisticated farm technologies, facilitate agricultural commercialization, and the expansion of rural farm and nonfarm enterprises (Mueller & Thurlow, 2019).

In light of this, African governments and their development partners have made concerted efforts and implemented several interventions, most of which are focused on promoting a shift from the conventional formal job creation towards agribusiness development. The central vision is to see youths as agripreneurs operating across different agricultural value chains to enjoy the livelihood and financial benefits embedded in commercialisation (Asciutti *et al*., 2016) and capitalize on opportunities created by rural transformation, such as financial literacy, technical and entrepreneurship training as well as increased access to credit, information, and

markets (Blattman & Ralston, 2015; Bulte *et al*., 2017; Yeboah *et al*., 2020). Examples of recent interventions include the International Institute of Tropical Agriculture (IITA) Youth Agripreneurs (IYA) Programme and the youth component of the Technologies of African Agricultural Transformation called Empowering Novel Agri-Business Led Employment (ENABLE-TAAT) programme**.** The common objectives of these programmes are to contribute to youth economic empowerment and through their engagement in agriculture, change the narrative of the ageing farming population and drive sustainable food production in Africa. In response, more young graduates are now involved in agriculture than ever before as a result of these programmes and recent agricultural innovations.

While agribusiness empowerment interventions have received widespread financial support from government and development partners (Adeyanju *et al*., 2020; Ogunmodede *et al*., 2020; Yami *et al*., 2019) including the World Bank which invests up to one billion U. S. dollars per year in training programmes, uptake and success rates remain low across Africa (Magagula & Tsvakirai, 2020; Zulu *et al*., 2021). This could be attributed to many interrelated factors. First, most interventions are likely implemented without first identifying relevant factors that promote participation. Beyond this, there are also some assumptions that interventions are not need-based and do not incorporate strategies that appeal to young people, raising a controversial debate on their worth and relevance.

Given the discourse in encouraging educated youth participation in agribusiness and related programmes, one key question that is of importance to policy and development planning is: What factors will encourage youth participation in agribusiness empowerment programmes? Equally important are the factors impeding youth engagement and key factors affecting the performance of youth-owned agribusinesses. Answers to these questions will help in

programme and policy design to engender youth engagement in agribusiness that is aimed at improving youth livelihoods and increasing agricultural production. However, there has been relatively little research that specifically explores the issue of educated youth participation in agricultural-related activities and how they engage with processes of rural transformation (Adeyanju *et al*., 2021; Yeboah *et al*., 2020).

Also, the few studies on the subject are mostly qualitative, country-specific, and use relatively small datasets (Addo, 2018; Adeyanju *et al*., 2021; Bello *et al*., 2021; Metelerkamp *et al*., 2019; Muthomi, 2017; Unnikrishnan *et al*., 2022; Yami *et al*., 2019). Thus, this paper embarks on a three-pronged task of first identifying the factors that motivate educated youths to engage in agribusiness. Second, the study assessed youth preference for agribusiness employment and identified factors that affect their agribusiness performance. This is to dissociate passion-driven from necessity-driven youths. Third, it identified the factors that influence youth participation in agribusiness interventions, taking evidence from the ENABLE programme in Kenya, Nigeria, and Uganda.

The unique attributes of graduates are such that they do not typify the dominant farmers who mostly have little or no formal education and therefore, there may be specific factors that drive their engagement in agriculture. Also, while it is valid that educated youths despise agriculture, the business component may be more enticing and could drive participation. Thus, the study highlights how the agricultural sector is evolving to include young graduates who would ordinarily prefer formal employment but, could bring innovations into agriculture and drive sustainable agricultural transformation in Africa.

This study significantly contributes to the research on youth engagement in agribusiness and agribusiness interventions in Africa. First, it contributes to the literature on the changing narrative of the agricultural landscape by assessing young graduates' motivation to engage in agribusiness. Second, the study identifies important factors for programme and policy planning to raise youths' interest in agriculture, and better design programmes to be more economically efficient, more attractive to potential beneficiaries, and maximize impact in the short- and long-run.

Findings across the three countries suggest that contrary to popular opinion, young graduates are willing to engage and remain in agribusiness to improve their economic and livelihood status. While it was found that the top motivational factors to engage in agribusiness are to escape unemployment and the vicious cycle of poverty (i.e., earn money), more youth were willing to remain in agribusiness, suggesting an increased consciousness of the benefits embedded in agricultural employment.

There is also evidence that young people are confronted by several technical, financial, and market-related challenges that affect their agribusiness performance and call for specific empowerment interventions. However, many of the respondents prefer not to participate in agribusiness interventions for their generic nature and credence of previous agribusiness programmes. Also, the idea of one cap fits all may not speak to the needs of individual youths and therefore discourage participation. Across the three countries, the results show that among other socioeconomic and demographic factors, youth perceptions of programmes and ownership of relevant assets determine programme participation.

The rest of the paper is organized as follows. Following this introductory section, section 5.2 presents the literature review on youth engagement in agribusiness in Africa, highlighting the key challenges that affect their performance. Section 5.3 documents the materials and methods, capturing the theoretical framework, data, and empirical framework. Section 5.4 presents the results and discussions while section 5.5 presents the conclusions and key implications for policy actions and future research.

5.2 Youth Engagement in Agribusiness in Africa

Emerging literature supports the argument that agribusiness will serve as a source of sustainable employment for many young Africans in the coming years (Adeyanju *et al*., 2020; Africa Economic Outlook Report, 2017; Muthomi, 2017; Yami *et al*., 2019). According to Yami *et al*. (2019), agribusiness has the potential to generate sustainable employment opportunities for a large number of young people. Despite this, young people display declining interest in the sector (Yeboah *et al*., 2020). While Ogunmodede *et al*. (2020) attribute this lack of interest to limited institutional support to mobilize and guide young people towards agribusiness, Adeyanju *et al*. (2021) relate it to the poor outlook and unfavourable agricultural policies to transform the sector. Even in the face of increasing favourable government policies and support, many young people see agriculture as not financially gratifying enough in a typified context of limited access to relevant assets and productive resources (Karki, Burton, & Mackey, 2020).

Besides, AbuMezied (2019) opined that factors such as poor adoption of agricultural technologies and improved agricultural practices also discourage young people from establishing start-ups in the sector. However, beyond perception and productive resources, Yami *et al*. (2019) posit that youth intention to engage in agribusiness is influenced by various

socio-cultural and economic factors. Liu *et al*. (2020) found demographic factors such as the level of formal education as one of the major factors that move young people away from agribusiness. Similarly, Ng'atigwa *et al*. (2020) found that more educated youth move towards formal employment and regard agricultural activities as labour-intensive jobs meant for uneducated people. This negative perception has led to the outward movement of young people from rural areas, where the bulk of agricultural activities are carried out, to urban centres in search of white-collar jobs. According to Naamwintome and Bagson (2013), rural-urban migration ranks high among the factors that affect youth engagement in agribusiness.

Even though the general narrative is that young people, particularly highly educated ones, snub a career in agribusiness (Kimaro *et al*., 2015; Liu *et al*., 2020; Yeboah *et al*., 2020), other studies have highlighted their growing interest in agribusiness, with an emerging crop of young graduate entrepreneurs in the agri-food sector (Addo, 2018; Metelerkamp *et al*., 2019). Addo attributed this to personality traits such as a penchant for agri-food activities as a means of livelihood and necessity: pull factors, including identified or given employment opportunities and push factors, such as unemployment and underemployment.

It is believed that the current influx of educated youths into agribusiness will help counteract an ageing farming population, notably, transform the agricultural sector, and make a positive contribution to food and nutrition security (Ripoll *et al*., 2017). In agreement, Mungai *et al*. (2018) argued that youth engagement in agriculture is critical to meeting SDG 2 on zero hunger, addressing climate change, and achieving economic development. Özçatalbaş and Imran (2019) opined that 'involving and incentivizing' young people to participate in food production will help reduce rural poverty, increase food security, and drive agricultural innovations.

Based on the critical role of young people, Muthomi (2017) recommends the need for concerted efforts to support young people who intend to engage in the sector. The author highlighted the need to ensure access to agricultural resources and services. From a policy point of view, Udemezue (2019) strongly suggests the need to include young people in dialogues on agricultural policies. In addition, he proposed that beyond perceiving youth as a unit of labour to be employed, their labour market aspirations and expectations coupled with the constraints they face should be considered and addressed. However, to design better interventions to support young people in agribusiness, it is imperative to understand the factors that influence their participation and the challenges they face. Identifying these factors and challenges is the major focus of the current study.

5.3 Materials and Methods

5.3.1 Theoretical Framework

The study was anchored on the utility maximization theory. According to this theory, an educated youth is assumed to be a logical economic agent who when presented with different alternatives, will opt for an option that gives the best utility (Greene, 2003). Within the context of rising graduate youth unemployment, a youth is likely faced with the choice of engaging in productive agribusiness activities or not. Thus, in this study, a youth was assumed to face two sets of alternatives k and l which is presented in Equation 5.1:

$$Z = \{k, l\} \tag{5.1}$$

Where Z represents the set of alternatives, k denotes the decision to participate in agribusiness-related activities and l represents the decision not to participate.

Based on this theory, participation decisions are made when the expected utility of participation is significantly more than the utility of not participating. According to Wekesa (2017), the

utility of each choice has two components, the deterministic and the error components. The latter follows a pre-determined distribution and is not dependent on the former. This makes it difficult to predict with certainty the alternative that an individual will select, suggesting that utility is not directly observable. However, the general assumption is that the probability of the perceived utility associated with a particular alternative is greater than the utility from all other available alternatives (Cascetta *et al*., 2015).

In essence, the utility that a youth, i gains from participation or otherwise comprises an observable deterministic component, X (the utility function) and a random component ε. Thus, the linear random utility can be expressed as:

$$U_k = \beta_k X_k + \varepsilon_k \text{ and } U_l = \beta_l X_l + \varepsilon_l \quad (5.2)$$

Where; U_k and U_l represent the expected benefits of participation decisions k and l, respectively; X_k *and* X_l are the deterministic components (vectors of independent variables which influence participation decisions); $B_k$and β_l are vectors of the parameter to be estimated; and ε_k and ε_l are the Independently and Identically Distributed (IID) error terms.

If a youth decides to participate in the programme, i.e. chooses option k, then it implies that U_k is greater U_l as shown in Equation (5.3).

$$U_k(B_k X_k + \varepsilon_k) > U_l(B_l X_l + \varepsilon_l), k \neq l \quad (5.3)$$

Thus, the probability of participation can be expressed as:

$$P(Y = 1|X) = P(U_k > U_l) \quad (5.4)$$

$$= P(B_k' X_k + \varepsilon_k - B_l' X_l - \varepsilon_l > 0|X) \quad (5.5)$$

$$= P(B_k' X_k - B_l' X_l + \varepsilon_k - \varepsilon_l > 0|X) \quad (5.6)$$

$$= P(B^* X_l + \varepsilon^* > 0|X = F(B^* X_k) \quad (5.7)$$

Where P is the likelihood function; $\varepsilon^* = \varepsilon_k - \varepsilon_l$ is the random error term; $F(B^*X_k)$ is the cumulative distribution function of ε^* estimated at B^*X_k; $B^* = (B_k' - B_l')$ is a vector of the net effect of the explanatory variables affecting participation decisions.

5.3.2 Empirical Model: Determinants of Youth Participation in the Programme

Following the theoretical framework, participation was measured as a binary variable which takes the value of 1 if a youth participated in the programme and 0 otherwise. Thus, a logistic regression model was fitted into the data set to identify factors that influenced participation in the programme.

Consider a regime (Y_i) which indicates if a youth is a participant or not. The model is specified as follows:

$$Y_i = \begin{cases} 1 & if \ \alpha \text{Xi} + \mu_i > 0 \\ 0 & otherwise \end{cases} \quad (5.8)$$

This is based on the assumption that the probability of Y_i assuming the value of 0 and 1 is $1 - P_i$ and P_i respectively. The probabilities are believed to be influenced by a vector of independent variables X_i, therefore, they can be expressed as a linear function of independent variables as presented in Equation 5.9:

$$P_i = \alpha X_i' \quad (5.9)$$

Equation 5.9 is a specification of the linear probability model (LPM), which is evaluated using Ordinary Least Squares (OLS). LPM is transformed to overcome challenges such as a questionable value of r-squared, non-normality of the disturbance term, non-fulfilment of the probability condition, and varying error terms that are associated with it. The probabilities are transformed to odds, and then odds to log-odds or logit to allow logit to assume any value along the real line. The log odds are specified as:

$$logit(P_i) = log\frac{P_i}{1-P_i} \quad (5.10)$$

The logit model is, therefore, expressed as a linear function of the independent variables as specified in Equation 5.11.

$$logit(P_i) = \alpha X_i' \quad (5.11)$$

Solving the probability P_i will yield Equation 5.12 which is used to model the binary logit for assessing factors influencing participation specified in 5.13

$$P_i = \frac{\exp(\alpha X_i')}{1+\exp(\alpha X_i')} \quad (5.12)$$

$$\Pr(Participate_i = 1) = \frac{\exp(\alpha_0+\alpha_i X_i}{1+\exp(\alpha_0+\alpha_i X_i)} \quad (5.13)$$

$(1 = \text{Participants}, 0 = \text{Non} - \text{ participants}$; X_i represents a vector of explanatory variables, and α_i denotes a vector of parameters.

The marginal effects of explanatory variables can be estimated as specified in 5.14:

$$\beta_m = [{}^{\partial(\alpha_i X_i + \varepsilon)}\big/_{\partial(\alpha_i X_i)}]\alpha_i \quad (5.14)$$

The empirical model of the effects of a set of explanatory variables on participation decisions using the logit regression model is therefore specified via the following linear relationship expressed in Equation 5.15:

$$Y_i = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \cdots + \alpha_n X_n + \varepsilon \quad (5.15)$$

Where: Y_i = Participation decision; X_{1-n} = Explanatory variables; α_{1-n} are the parameters to be estimated and; ε = Error term

The selection of independent variables was based on an extensive review of existing literature (Adeyanju, Mburu, Mignouna *et al*., 2021b; Kluve *et al*., 2019; Unnikrishnan *et al*., 2022). The decision to participate in agribusiness empowerment programmes depends on the perception and expectations of an individual. The measurement and expected signs of the variables are presented in Appendix 5A.

5.3.3 Data, Sampling, and Variable Definition

The data used in this study were obtained under the ENABLE-TAAT programme funded by the African Development Bank (AfDB) and facilitated by the International Institute of Tropical Agriculture (IITA). The data were collected through a questionnaire survey of young graduates engaged in agribusiness in Kenya, Nigeria, and Uganda, between September and December 2021. These countries were purposively selected based on three criteria. Firstly, they were three of the pioneering countries in which the ENABLE-TAAT programme was conducted in 2018. The second criterion was related to the severity of youth unemployment and underemployment, while the third criterion was based on the relatively high number of programme participants compared to the other countries.

A multistage sampling technique was adopted in selecting the respondents. Following the purposive selection of the three countries as earlier discussed, the study population was stratified into participants and non-participants of the programme in the second stage. Participants were those who participated in the ENABLE-TAAT programme in 2018, and non-participants were other young graduates who did not participate in the programme but, are engaged in agribusiness.

The list of participants and non-participants was obtained from the repository of the ENABLE-TAAT programme in each country. These lists also served as the sampling frames for selecting the participants and non-participants. Based on the sample size determination formula proposed by Yamane (1967), the third stage involves the random selection of 1463 respondents, comprising 747 participants and 716 non-participants, across the three countries using random numbers generated on Microsoft Excel.

Specifically, the total sample size of 1463 was proportionately shared between the three countries based on their respective sampling frames. A total of 407 youths (186 participants and 221 non-participants) were selected in Kenya, 440 youths (238 participants and 202 non-participants) from Nigeria, and 617 youths (324 participants and 293 non-participants) in Uganda. However, out of those selected, 400 respondents (183 participants and 217 non-participants) participated in Kenya, 429 respondents (230 participants and 199 non-participants) participated in Nigeria, and 606 respondents (324 participants and 282 non-participants) participated in Uganda, making 1435 respondents in total. This gives a 98 percent response rate. The 2 percent excluded was due to the unavailability and refusal of some respondents to participate.

Before the main survey, the questionnaire was pre-tested for validity and completeness. The questionnaire was administered by trained enumerators who had at least 14 years of formal education, could speak English and local languages fluently, and had prior experience in conducting field surveys. The survey was closely monitored and supervised by the programme coordinators and lead investigators.

5.4 Results and Discussions

5.4.1 Results of the Descriptive Statistics

Table 5.1 presents the pooled and country-disaggregated summary of the socio-demographic characteristics of the respondents. According to the data, approximately 51 percent of the total respondents surveyed were ENABLE programme participants, with 46 percent, 54 percent, and 53 percent from Kenya, Nigeria, and Uganda, respectively. All respondents were less than 30 years old, verifying that they were youths and in their active productive years (Federal Republic of Nigeria, 2019). About 57 percent were male, including 56 percent and 58 percent of non-participants, respectively. Similarly, the country disaggregation shows that over 50 percent of both groups are male. Regardless of participation status, the years of formal education and household size were similar across the three countries. Specifically, the average years of formal education and household size were 14 years and 5 persons, respectively. Asset ownership was higher among the participants than the non-participants, with higher values observed among the Kenyan participants.

Access to credit was low among the respondents, except for Uganda where all the participants indicated that they accessed credit in the 6 months preceding the survey. This low access to credit could be attributed to poor creditworthiness and the lack of relevant collateral required by financial institutions. The data shows that over 60 percent across the three countries are residents in rural areas. While the general notion is that young graduates prefer the city life where they can compete for formal employment, the results could be attributed to the expensive city life which could be hard on unemployed youths with no sustainable source of livelihood. In essence, people will most likely relocate to their place of origin as a last resort in the face of economic challenges.

Table 5. 1. Descriptive Statistics for the Socio-economic and Demographic Characteristics of the Youth in Kenya, Nigeria, and Uganda

Variable		Pooled		Kenya		Nigeria		Uganda	
	n = 1435	Participants (n=737)	Non-Participants (n=698)	Participants (n=183)	Non-Participants (n=217)	Participants (n=230)	Non-Participants (n=199)	Participants (n=324)	Non-Participants (n=282)
Participation		51.36	-	45.75		53.61		53.47	
Age of Respondents	28.50	27.81	29.24	27.62	30.24	29.27	29.95	26.88	27.96
Gender of respondent	57.35	56.58	58.17	52.46	58.06	64.78	69.35	53.09	50.35
Education (Years)	14.21	14.43	13.97	14.02	13.51	15.30	15.87	13.64	13.39
Household Size	4.96	4.82	5.10	5.10	5.19	4.66	4.91	4.18	5.16
Marital status	0.57	0.50	0.64	0.47	0.71	0.47	0.56	0.54	0.63
Agribusiness experience	4.41	4.08	3.76	3.73	4.34	3.91	4.44	4.40	5.30
(log)Value of productive assets	6.00	6.26	5.73	6.76	5.97	5.44	5.22	6.57	5.89
Access to credit	0.40	0.56	0.22	0.20	0.24	0.23	0.19	1.00	0.25
Residence	86.55	90.83	82.50	92.90	94.93	70.89	82.41	84.88	93.62
Sector of household head	72.33	71.51	73.21	62.84	62.67	60.00	75.38	84.57	79.79
Business level (Growth)	0.72	0.74	0.70	0.77	0.75	0.78	0.74	0.69	0.65
Full-time engagements	0.78	0.79	0.77	0.79	0.77	0.79	0.74	0.78	0.80
Perception	0.75	0.82	0.68	0.71	0.60	0.80	0.80	0.88	0.65
Access to information	0.69	0.99	0.36	1.00	0.46	0.99	0.21	1.00	0.41

The majority of the respondents across the three countries were operating at the growth stage of business, indicating that they have been doing business for over 3 years as further shown by the data on years of agripreneurship experience. Compared to the other countries, access to land was higher among the respondents in Uganda which could be attributed to recent efforts by the Ugandan government to support young agribusiness owners. More participants than non-participants had a positive perception of agribusiness empowerment programmes which could have motivated their participation in the ENABLE-TAAT programme.

Overall, the data showed some similarities among the respondents across the three countries, indicating that they are not so different based on key socio-economic and business characteristics. For instance, both participants and non-participants across the three countries were similar in terms of age, household size, years of formal education, type of agripreneurship engagement, and years of agripreneurship experience. Thus, the aggregated econometric results could have useful implications for Africa in general as well as different countries in the continent. The study, however, disaggregated the analysis to inform policy discussions in each country.

5.4.2 Motivation to Engage in Agribusiness

With a rapidly growing population, widespread graduate unemployment remains a critical socioeconomic concern. Many university graduates sought employment in the informal sector across various countries due to poor school-to-work transitions (Elder & Koné, 2014). That said, more young graduates are turning to agribusiness, which in the past was loathed and disregarded. Because of these dynamics, the agricultural sector is becoming increasingly important, not just for the rural and unskilled labour force but for the youth population who

could leverage their skills and youthfulness to transform the sector. This study identified six key push or pull factors that motivate educated youths to engage in agribusiness (Figure 5.1).

The results show that the majority (90 percent) of the youths joined agribusiness because it was the only source of employment available to them. This is similar across the three countries where over two-thirds settled for agribusiness because it was their only source of livelihood after graduation. This could be because the majority of the respondents live in rural areas where agriculture is the mainstay. As a result, they may have difficulty finding formal employment since industrial development is skewed against these areas. This also suggests that their livelihood is subject to the ability to leverage previous farming experience and existing networks within the rural community.

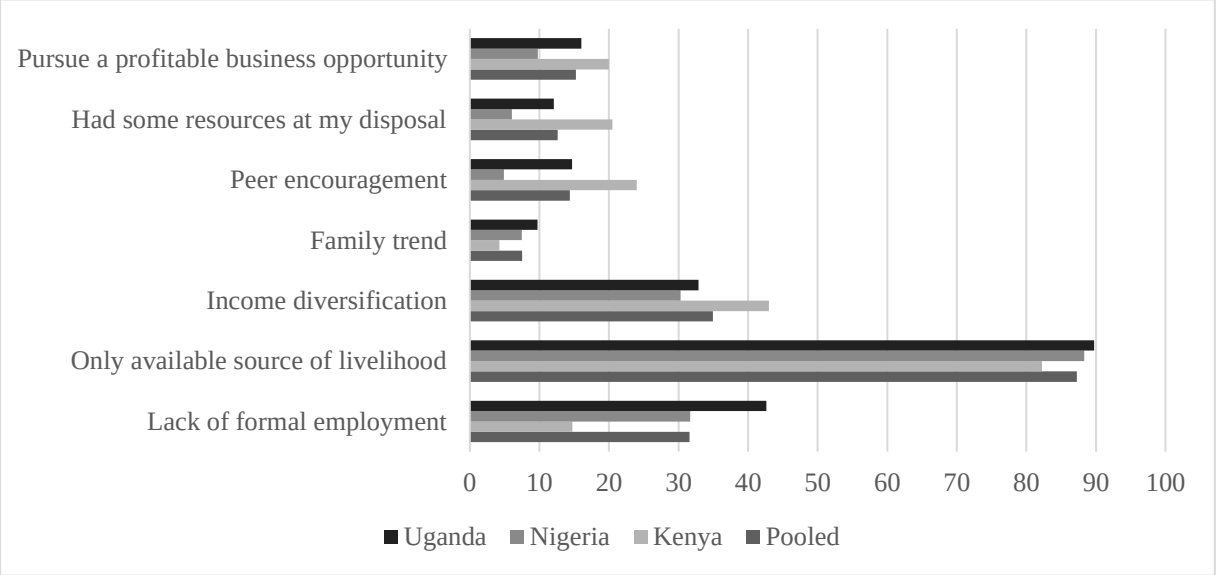

Figure 5. 1. Youths' Motivation to Engage in Agribusiness in Kenya, Nigeria, and Uganda

About 32 percent of the youths, including 43 percent, 30 percent, and 33 percent in Kenya, Nigeria, and Uganda, respectively, started agribusiness due to the inability to secure formal employment in the city, implying that agribusiness is not their preferred employment option

but only joined because it was a better option than those available. As a result, their involvement may be limited and contingent on securing formal employment. Unemployment, according to Martínez-Cañas *et al*. (2023), is a push motivational factor that stems from negative emotions and is likely to lead to individuals having an increased perception of the risk involved in venture creation, which could affect business performance. Such dynamics spark waves of urban-rural migration, as many graduates return to their villages to work in informal sectors (Arthur-Holmes *et al*., 2022). This corroborates Rietveld *et al*. (2020) who found that many youths return to rural areas, either permanently or temporarily, when they fail to fulfil their aspirations or run out of means to support or manage their urban lifestyles.

The pooled analysis showed that about 35 percent of the respondents joined agribusiness for livelihood diversification. This includes 43 percent, 30 percent, and 33 percent of the respondents in Kenya, Nigeria, and Uganda, respectively. This suggests that some graduates consider agribusiness as a viable livelihood option and a strategy to complement or optimize income. While the study did not investigate the factors that contributed to this, one plausible explanation could be that these youths are underemployed or that their income from formal employment is insufficient to meet their personal and household needs. This supports other reports on the high rate of youth underemployment in Africa (Elder & Koné, 2014; Chitema, 2020). Corroboratively, Arthur-Holmes *et al*. (2022) found that many educated youths in Ghana take up part-time employment in informal sectors due to low entry-level salaries and remunerations.

About 14 percent joined agribusinesses based on suggestions and encouragement from friends engaged in agribusiness. The country comparison shows a higher proportion (two-fifths) in Kenya compared to the other countries. These results suggest that youths regard exploration of

their social network, including family and friends as a crucial activity in the course of making livelihood decisions as it pertains to agribusiness. According to Ambad and Damit (2016), friends have a great influence on individual career choices since they are considered as role models who can provide key information, guidance, and support. Similarly, discussing with friends and peers about agribusiness-related issues as well as perceiving them as helpful for the clarification of their agribusiness ideas could inform engagement decisions. This supports Kracke (2002) who highlighted the relevance of peer support in the process of making future career decisions.

According to the country analysis, 20 percent, 10 percent, and 16 percent of respondents in Kenya, Nigeria, and Uganda, respectively, are motivated by the prospect of a profitable venture in agribusiness. Beyond the misconception of agriculture as a poverty-ridden occupation, its business component could typify any other business in other sectors. For instance, Córdoba *et al*. (2018) argued that agribusiness is characterized by large capital investments and the use of advanced technology to accumulate and reproduce transnational capital. One plausible explanation for this result could be the freedom and job flexibility that comes with self-employment. Thus, despite the negative perception of agriculture, educated youths with their innovativeness and industriousness could earn more income and profit from agribusiness activities. This aligns with Arthur-Holmes *et al*. (2022) who found that many young graduates in Ghana preferred jobs in the informal sector because they paid better than formal employment. According to Hamilton *et al*. (2015), younger farmers tend to be more driven to create and grow their business ventures, are more receptive to novel ideas, are willing to take bigger risks, and are more frequently willing to use loan capital to expand the business than older farmers.

Regarding productive resources, about 13 percent across the three countries joined agribusiness because they had basic investment resources. The country disaggregation shows that compared to the other countries, more youths (over one-fifth) in Kenya joined agribusiness because they had access to productive resources. This implies that access to certain resources such as credit and land could facilitate youth engagement in agribusiness. This corroborates different studies that have highlighted low access to productive resources such as credit, land, and business equipment as a major impediment to youth engagement in agribusiness in Africa (Adeyanju, Mburu, & Mignouna, 2021; Adeyanju *et al*., 2021; Ng'atigwa *et al*., 2020).

5.4.3 Job Preference and Intention to Remain in Agribusiness

Considering the unemployment-agribusiness engagement dynamics earlier discussed, the study assessed the employment preference and intention of young graduates to remain in agribusiness, either as a main or complementary source of livelihood. The results are presented in Figures 5.2 and 5.3. Contrary to prior expectations, the pooled distribution revealed that about 78 percent of the respondents prefer agribusiness employment as their main livelihood source while only 5 percent and 17 percent prefer formal employment and business in other sectors, respectively (Figure 5.2). The country disaggregation further shows that Nigeria has the highest percentage of youths (84 percent) with a strong preference for agribusiness compared to less than 10 percent who indicated preference for formal employment and business in other sectors, respectively. Similarly, over two-thirds indicated their preference for agribusiness employment against formal employment and other forms of business in Kenya and Uganda.

While reports have shown that many young people detest agricultural careers due to low average wages, outdated technology, hard physical work, and the remoteness of farms (Babu

et al., 2021; Unay-Gailhard *et al*., 2019), these results could be due to increased consciousness of the benefits embedded in agribusiness (Adeyanju *et al*., 2021; Yami *et al*., 2019). Also, the declining opportunities in the formal sector coupled with the gradual shift in career incentives from other sectors (e.g., the current minimum wage in Nigeria is about 50 USD per month) to agricultural-related employment within the African context could inform young graduates' preference for agribusiness careers. For instance, Banson *et al*. (2015) found that youth in rural Brong Ahafo, Ghana, prefer to engage in the agricultural value chain because it generates fast economic returns and gives them the flexibility to make personal decisions. Similarly, Baloyi *et al*. (2022) found that youths are more likely to be attracted to economic activities along the agricultural value chain compared to primary agriculture because the business aspect allows young people to perceive agriculture as other contemporary businesses of economic importance (Ikuemonisan *et al*., 2022).

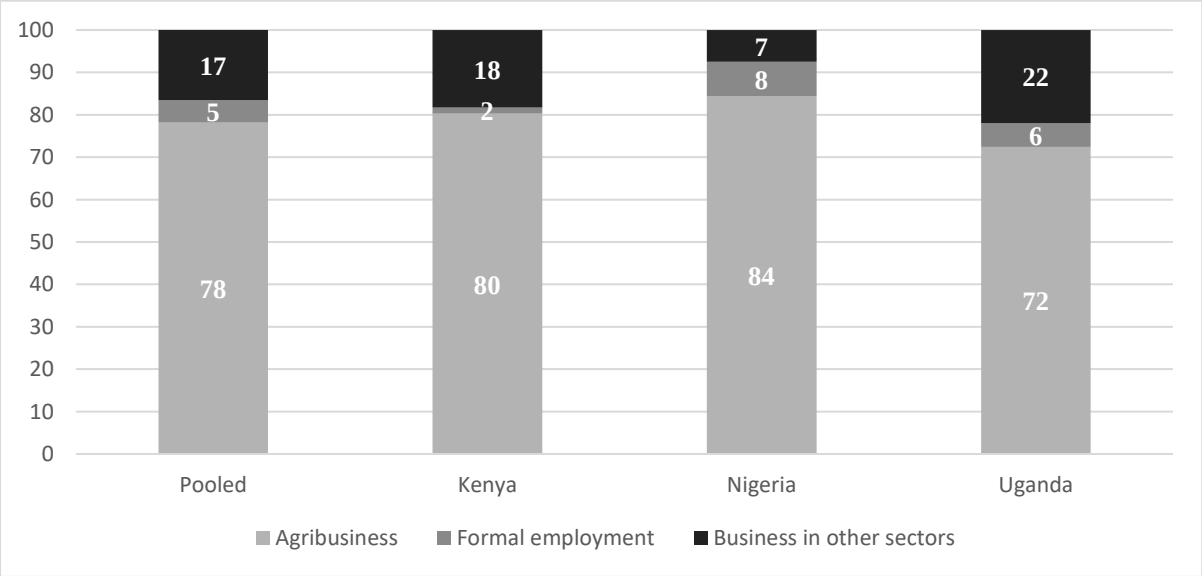

Figure 5. 2. Job Preference of Youths in Kenya, Nigeria, and Uganda

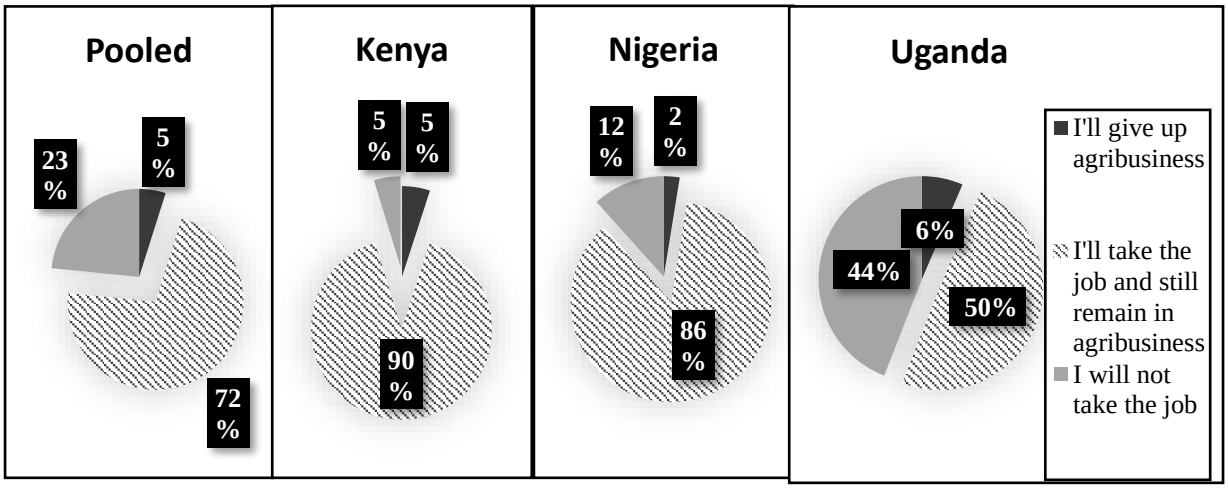

Figure 5. 3. Youths' Intention to Remain in Agribusiness in Kenya, Nigeria, Uganda

Despite the rosy narrative around formal employment in Africa, about 23 percent of the youths are unwilling to quit their agribusinesses even if they are offered alternative jobs that pay twice their agribusiness income. Also, about 73 percent indicated that they would combine the job with their agribusinesses, suggesting a strong intention to remain in agribusiness. According to Elder and Koné (2014), most of the jobs available to young people are relatively insecure, poorly remunerated, and/or seasonal. Agribusiness, on the other hand, could provide job security and flexibility that allows willing youths to explore other alternative employment sources. Young people will typically favour non-agricultural occupations or off-farm employment if they offer stability and job security (Bello *et al*., 2021; Rietveld *et al*., 2020). However, if they are unsure of the economic prospects of the non-agricultural employment opportunity, they are more likely to hold on to their agribusinesses.

The few respondents willing to quit their agribusiness for another alternative suggests that some youths will choose job security over increased income. This, by implication, could mean that for some of the youths, agribusiness is the best pathway for survival and/or a viable route to a secure decent livelihood. Additionally, agribusiness offers young graduates an opportunity to

diversify their income sources. This supports Mwaura (2017) and Williams and Pompa (2017) who both emphasized the significance of diversified livelihoods, explaining that youth engagement in the labour market features exploring, combining, and juggling different livelihood choices.

5.4.4 Factors Affecting the Performance of Youth Agribusinesses

Within the context of African agriculture, youth continue to battle challenges that affect their agribusiness and labour market performance. The results presented in Figure 5.4 reveal that five major factors affect youth agribusiness performance across the three study countries. Prominent among these factors is the lack of access to credit facilities as reported by about 75 percent of the respondents with more severity in Nigeria.

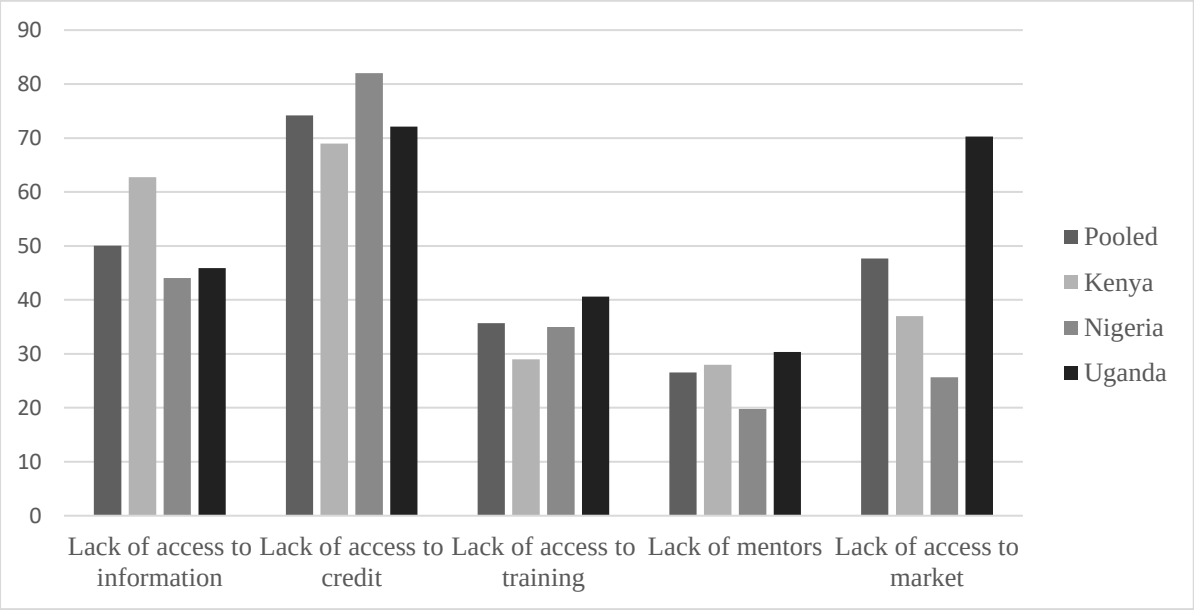

Figure 5.4. Factors Affecting Youths' Agribusiness Performance in Kenya, Nigeria, and Uganda

Generally, access to credit can improve agricultural productivity and performance (Alhassan *et al*., 2020) through increased investment and improved access to productive inputs. Similar

to this study, Lawi (2016) and Adeogun (2015) found that lack of access to credit is detrimental to youths' engagement in agribusiness. Also, Ankrah *et al*. (2020) attribute youths' confidence to engage in agribusiness to increased access to financial resources.

Lack of access to information also plays a prominent role in influencing youth agribusiness performance. About 50 percent of the respondents identified the lack of access to relevant agribusiness information as a performance-limiting factor. This includes 62 percent, 48 percent, and 47 percent in Kenya, Uganda, and Nigeria, respectively. Baloyi *et al*., (2022) identified limited access to information as a principal challenge to youths' productivity and entrepreneurial development. These results strongly support the idea that information is key to agricultural productivity (Bonye *et al*., 2012).

Forty-eight (48) percent of the respondents identified limited access to the market as the major impediment to their business performance. Lack of marketplace experience and limited network within the agricultural sector could limit youths' ability to penetrate local and further markets. The analysis showed that more respondents (70 percent) in Uganda lack access to the market compared to 38 percent and less than one-third in Kenya and Nigeria, respectively. The low percentage of youths with limited market access in Nigeria could be attributed to the high population which provides a huge customer base and ability to leverage digital tools to reach potential customers. These results align with the current reality in these countries where the agricultural markets are highly unstructured. Maurice *et al*., (2019) also found that unstructured markets play an important role in driving youths away from agribusiness. Where market inefficiencies are at play, it might negatively affect youth agribusiness performance, thus triggering their exit from agribusiness activities.

About 36 percent of the respondents identified limited access to training as a major impediment to performance. This includes 29 percent, 35 percent, and 41 percent of the respondents in Kenya, Nigeria, and Uganda, respectively. According to Mungai *et al*. (2020), access to agribusiness training is essential to develop relevant literacy, numeracy, managerial and business skills to improve performance. In a similar study, though under corporate business conditions, Mayuran (2016) revealed a positive and significant link between training and firm performance. More related to these findings, Adeyanju *et al*. (2021) found that participation in agricultural programmes improves the performance of young agripreneurs in Nigeria. Similarly, Robinson-Pant (2016) argued that providing small actors with market intelligence training can expose them to market opportunities and improve their agribusiness management skills.

Over one-fourth of the respondents identified lack of mentorship as an impediment to their agribusiness performance. This could be attributed to limited agribusiness experience as a result of more years of schooling. Abbasianchavari and Moritz (2021) argued that mentorship promotes the transfer of explicit knowledge and provides 'know-how' and 'know-who' that can contribute to better performance. In support, Mungai *et al*. (2018) posit that having access to mentors can potentially reduce the negative impact of experience gaps and prevent the early death of youth-owned businesses.

5.4.5 Logit Model Diagnosis Test Results

The correlation test showed that there was no statistically significant correlation between the variables as all the coefficients were less than 0.2, indicating that there was no noticeable problem of correlation among the variables. Also, the Hosmer and Lemeshow's goodness-of-fit test result had a chi-square (8) of 5.78 with a p-value of 0.6715 which implies that the null

hypothesis stating that the model is fit could not be rejected, implying that the model was fit for the analysis. In addition, the mean value of the VIF was less than 10 and the tolerance level (1/VIF) had values which were all greater than 0.6 confirming further that there was no problem of multicollinearity. Also, the result of the null hypothesis of the Bruesch-Pagan/Cook-Weisberg test for the presence of heteroscedasticity had a chi-square of 0.07 and a p-value of 0.7949 indicating that the null hypothesis of homoscedasticity could not be rejected. Thus, it was concluded that there was no problem of heteroscedasticity in the model.

5.4.6 Determinants of Youth Participation in the ENABLE-TAAT Programme

Table 5.2 presents the coefficients and marginal effects obtained from the logistic regression model for the pooled and disaggregated analysis. The marginal effects, which show the effect of a unit change in the explanatory variable on the likelihood of programme participation, are discussed. Factors that significantly influenced participation decisions include years of formal education, gender, marital status, household size, asset value, agribusiness experience, credit, and perception.

The pooled result shows a positive and significant correlation between perception and the likelihood of participation such that respondents who perceive the programme as a means of skill acquisition and networking opportunity are more likely to participate than those who perceive otherwise. The marginal effect for the pooled analysis implies that those who perceive programmes as beneficial were 10 percent more likely to participate than those who perceived otherwise. Similar results were obtained across the three countries. This could be because perception drives people's intentions and actions. This corroborates Kim and Park (2017) who identified the concept of perceived value as one of the most important indicators of behavioural

intentions which drives action and adoption. These results suggest the need to design programmes with desirable qualities that could attract young people.

Table 5. 2. Determinants of Youth Participation in the ENABLE-TAAT Programme in Kenya, Nigeria, and Uganda

Variables	Pooled	Kenya	Nigeria	Uganda
Perception (positive=1)	0.119***	0.092***	0.026***	0.328***
(Log) Total asset value	0.044***	0.137***	0.037**	0.066***
Experience (years)	-0.032***	-0.048**	-0.024	-0.036***
(Log) Age	-0.156	-1.028	-0.257	-0.138
(Log) Education	0.391***	0.248	0.519***	0.077
Gender (Male=1)	-0.022	-0.159***	-0.005	-0.054
Marital status (Married=1)	-0.095	-0.167***	-0.046	-0.049
Household size (#)	-0.010*	-0.028	-0.016	-0.007
Business level (Start-up=1)	0.060**	0.182**	0.037	0.034
Credit (Yes=1)	0.300***	-0.041	0.058	
HHhead_Sector (Agric=1)	-0.018	-0.001	-0.139***	0.102

Notes: This table presents the marginal effects from the logit model; *** p <0.01, ** p < 0.05, * p < 0.1

The total assets value was positively and significantly correlated with the likelihood of participation, suggesting that asset-rich youths are more likely to participate in the programme across the three countries. Specifically, the results show that the higher the estimated value of assets reported by an agripreneur, the more likely they are to participate in the programme. A higher value of assets could imply more advanced productive assets requiring qualified manpower. Thus, the training aspect of agribusiness empowerment programmes could help fill this need. Also, youth may see these programmes as an opportunity to convert their productive assets into business activities that could generate sustainable income for them and, thus,

improve their economic status (Bello *et al*., 2021). Personal interaction with some respondents justifies this explanation, as some participants had equipment requiring advanced technical know-how and proper handling.

Years of agribusiness experience was negative and significant at $p<0.01$ for the pooled analysis, indicating that more years of experience had a negative effect on the likelihood of participation. Considering the marginal effect, a unit increase in the years of agribusiness experience reduced the likelihood of participation by about 3 percent. Similarly, years of agribusiness experience was a negative and significant determinant in the two East African countries. On the one hand, this could be attributed to the perception of highly experienced agripreneurs as being more knowledgeable and not seeing the need for additional training. This is supported by Balana *et al*. (2022), who argued that experienced traders prefer to keep their old habits and may not necessarily adopt new practices. On the other hand, it could also be attributed to programme targeting strategies or the credence of past empowerment programmes. For instance, the credence of past failed interventions may discourage participation. This could explain the negative effect found in the two East African countries which have a long history of agribusiness empowerment programmes compared to Nigeria. This result, however, contradicts Adeyanju *et al*. (2021) who attribute the positive relationship between experience and participation to the increased consciousness of the benefits embedded in agriculture as people grow older.

While education had a significant influence on the likelihood of participation in the pooled analysis and Nigeria, it was not significant for Kenya and Uganda. One plausible explanation for the Nigerian result could be the high population that reduces the probability of securing employment in the formal sectors. Compared to the other two countries, graduate youth

unemployment is pronounced and severe in Nigeria, ranking among the top three countries with the highest rate of youth unemployment in Africa[8]. This issue may drive more educated youth to explore alternative job opportunities in the informal sector. Thus, considering that they spent most of their years acquiring formal skills, they may need lots of training and mentorship to kickstart their agripreneurship careers. While this explanation is not affirmative, the agricultural sector has been identified as one that could provide sustainable employment for many youths, particularly young graduates residing in rural areas (Yami *et al*., 2019). The concept of agripreneurship, which is different from the conventional idea of farming, could make agriculture more attractive to young graduates and invariably, contribute to agricultural transformation in Africa. This significant link between years of formal education and participation was expected for the pooled analysis since the programme was designed for unemployed graduates.

For the pooled analysis and Kenya, the business level was positive and significant at $p<0.05$, indicating that those operating at the start-up level, with less than 4 years of experience are more likely to participate in the programme. This result also supports the previous explanation that those with less experience are more likely to participate in the programme.

Another factor that determined participation in Nigeria was marital status. The negative sign implies that married young Nigerians are unlikely to participate in the programme. In estimating the magnitude of this effect, the value of the marginal effect shows that being married reduced the likelihood of participation by 17 percent. The direction and significance of access to credit for the pooled analysis imply that credit access influenced youths' likelihood of programme participation regardless of the source. One plausible explanation is that access

[8] https://tradingeconomics.com/country-list/youth-unemployment-rate?continent=africa

to credit facilitates business expansion which could influence agripreneurs to participate in empowerment programmes that incorporate training and mentorship, such as the case study. This is consistent with Danso-Abbeam *et al*. (2018), who argued that access to credit encourages farmers to participate in training programmes to get more information that could help in maximizing their yield to repay the credit on time. However, the result was not significant for the country disaggregated analysis.

CHAPTER SIX

EVALUATION OF THE IMPACT OF THE ENABLE-TAAT PROGRAMME ON YOUTH AGRIPRENEURSHIP SKILLS IN KENYA, NIGERIA, AND UGANDA[9]

Abstract

This chapter examined the driving forces behind young agripreneurs' participation in agripreneurship empowerment programmes and estimates the causal impact of programme participation on agripreneurship skills using data from a random cross-section sample of 1435 young agripreneurs in Kenya, Nigeria, and Uganda. Specifically, the study took evidence from the youth component of the African Development Bank Technologies for African Agricultural Transformation (TAAT) programme, Empowering Novel Agribusiness-Led Employment (ENABLE). An endogenous switching model was used to identify factors that significantly informed participation decisions and assess the programme's impact on youth agripreneurship skills. Age, education, agripreneurship experience, business level, current residence, and training perception were correlated with an increased likelihood of participation. Even though both programme participants and non-participants had high agripreneurship skills scores, participants had higher scores across the three countries than non-participants. The impact estimates from the switching regression model also indicate that participation has a significant and positive impact on agripreneurship skills, which implies that the higher score achieved by participants could be attributed to their involvement in the ENABLE-TAAT programme. These

[9] This paper on Objective three is published in Heliyon.
Adeyanju, D., Mburu, J., Gituro, W., Chumo, C., Mignouna, D., Mulinganya, N., & Ashagidigbi, W. (2023). Can young agripreneurs improve their skills through agripreneurship empowerment programmes? Evidence from Africa. *Heliyon*, *9*(1). https://www.sciencedirect.com/science/article/pii/S240584402300083X

results suggest raising awareness of youth agribusiness empowerment programmes and encouraging youth to participate more actively. Additionally, the result suggests the need to implement strategies that could change young people's negative perception of agricultural interventions for increased participation.

Keywords: Young agripreneurs; agripreneurship programmes; Africa; agripreneurship skills; Agribusiness

6.1 Introduction

In recent years, more emphasis has been placed on young graduates who, despite their literacy level, struggle to find gainful employment in the labour market. According to reports, graduate youth unemployment is pronounced and severe in Africa (Chitema, 2020), due to limited opportunities for self-development and employment, particularly in the formal sector (IFAD, 2019). For instance, tertiary institutions in Nigeria and Kenya graduate an average of 500,000 students annually, but only about half can secure sustainable employment (Hall, 2017). The situation is worse in Uganda, where nearly 400,000 young graduates compete for only about 9,000 available jobs each year. This corroborates Ntale *et al*. (2019), who noted that over 30 percent of Ugandan youths who are institutionally qualified are unable to find employment.

The situation is more difficult for semi-skilled and unskilled youths. This low labour market absorption rate has left about 60 percent of the close to 420 million youth in the continent discouraged and jobless, about one in three vulnerably employed, and less than two-fifths in wage employment (AfDB, 2016). Unarguably, unemployment and underemployment threaten the welfare of youth and, more generally, the stability and socio-economic development of their society (FAO & ECA, 2018). According to the World Bank (2011), over 40 percent of youths who join rebel groups do so for lack of employment and other income-generating opportunities.

These ongoing have led to a growing demand for urgent policy- and programme-level interventions to curb youth unemployment, underemployment, and its accordant undesirable outcomes, particularly among young graduates. In response, African leaders and development partners have made concerted efforts, primarily focused on promoting a shift from conventional formal employment towards entrepreneurship, with a deliberate focus on agriculture. Such

measures include the youth component of the African Development Bank Technologies for African Agricultural Transformation (TAAT) programme called Empowering Novel Agribusiness-Led Employment (ENABLE), designed and implemented to reduce the economic marginalization of African youth by introducing them to modern agricultural technologies to promote agribusiness development.

Furthermore, the programme aimed to help young people develop relevant agripreneurship skills and capabilities in various aspects of the agricultural value chain for improved agribusiness performance and, subsequently, better livelihood outcomes. The central vision is of youth as agripreneurs operating across different agricultural value chains to enjoy the livelihood and financial benefits embedded in commercialisation within the framework of globalisation (Asciutti *et al*., 2016).

While the importance of youth agripreneurship in reducing youth unemployment (Magagula & Tsvakirai, 2020; Ouko *et al*., 2022), combating hunger and food insecurity and revamping the agricultural sector has been widely discussed in Literature (Akrong & Kotu, 2022; Ray, Panigrahi, & Mohapatra,2022), Babu and Zhou (2020) argued that its development, particularly in Africa is accompanied by many bottlenecks including low skill set required for agribusiness and related activities. According to the authors, young people typically have limited knowledge and agribusiness skills and little or no exposure to the agribusiness environment. As a result, they face severe market and price risks compounded by the risky and uncertain nature of agricultural activities. This is supported by other scholars, who noted that while all age groups face recurring challenges associated with agribusiness, such as access to technology, weather uncertainty, poor market linkages, and price risks, these challenges are

typically exacerbated for young people due to lack of relevant agripreneurship skills and experience (Faysse *et al*., 2019; Williams & Hovorka, 2013).

According to Lachaud *et al*. (2018), lack of skills undermines efficiency and deters agricultural growth and development. This corroborates Akinbami *et al*. (2019), who attribute poor enterprise development to the lack of relevant skill sets and productive assets, which invariably leads to business failure. Ouko *et al*. (2022) opined that despite several opportunities in agripreneurship, young people might not benefit from these opportunities due to poor or lack of relevant agripreneurial skills. This is supported by Adeyanju *et al*. (2021), who posits that the resource constraints that young agripreneurs face necessitate the development of relevant agripreneurship skills needed to maximize their limited resources and profit. With ongoing economic and environmental challenges facing the World, there is a more urgent need to diversify young farmers' skills beyond primary food production to expand economic opportunities and improve their livelihood (Mulema *et al*., 2021).

In recent times, agripreneurship empowerment programmes have become a common strategy to promote youth agripreneurship, help young people develop relevant skills, and invariably improve the performance of youth-led agribusiness enterprises (Adeyanju *et al*., 2021; Adeyanju, Mburu, and Mignouna 2021; Yami *et al*. 2019). Ray *et al*. (2022) described these programmes as a push factor for young people to adopt innovations designed to solve specific agricultural problems. Also, a few studies have reported their potential in harnessing the agripreneurship potential and improving the agripreneurship skills of young farmers (Adeyanju *et al*., 2021; Mulema *et al*., 2021; Yami *et al.,* 2019).

However, while the rapid evolution of agripreneurship programmes is well understood and documented, not much is known about how they contribute to their beneficiaries' agripreneurship skills development and business performance. This is consistent with the argument of Ray *et al*. (2022) that intervention aimed at shaping young people as the future of agriculture receives little empirical attention. This lack of empirical evidence, in turn, poses a challenge to making evidence-based policies on youth agripreneurship, and developing policy strategies for successful investments in youth, and poses a challenge to achieving the long-advocated agricultural transformation.

It is worth noting that the bulk of existing studies on agripreneurship empowerment and agricultural programmes target smallholders without necessarily focusing on young actors (Dizon, Josephson, and Raju 2021; Haji and Legesse 2017; Lenfant 2017; Zakaria *et al*. 2020). Also, the few studies that focused on youth are country-specific, and a comparativeness of what works in different countries coupled with the determining factors related to programme participation and agripreneurship skills are lacking (Magagula & Tsvakirai, 2020; Nwibo *et al*., 2016). Thus, from an economic and cultural perspective, it is cognitively beneficial to have a reference point in data from different countries to obtain adequate and in-depth judgments on programme impacts and compare outcomes between countries.

This study addresses the identified research gaps by assessing the impact of the ENABLE-TAAT youth programme of the African Development Bank on youth agripreneurship skills while recommending a feasible direction to develop agripreneurship to yield better economic outcomes for youths. Concerning sample size and comparativeness, the study took samples from three African countries to assess the programme's impact on youth agripreneurship skills.

6.2 Materials and Methods

6.2.1 Assessing the Impact of the Programme on Youth Agripreneurship Skills

Many scholars have argued that assessing the impact of an intervention based on non-experimental observations could be a bit challenging. This is attributed to the issue of counterfactuals, whose outcome is not observed. One proposed solution to this challenge is finding suitable instruments to account for endogeneity. However, another challenge is associated with the standard econometric method of using a pooled sample.

The basic assumption of a pooled regression model is that the two groups have common slope coefficients. In other words, it is assumed that the set of covariates included in the model has the same influence on both programme participants and non-participants. The application of a pooled regression would, therefore, imply that the participation status of youth (participants or non-participants) only has a parallel shift (intercept) effect on agripreneurship skills, which means that the intercept shift effect will be the same regardless of the values of other parameters included in the outcome equation.

In addition, youth may endogenously self-select participation in the programme, which implies that participation decisions may be systematically influenced by both observed and unobserved characteristics associated with outcomes. This type of econometric problem (endogeneity and sample selection bias) motivates the choice of the Endogenous Switching Regression (ESR) model to assess the programme's impact on youth agripreneurship skills.

The ESR model can be estimated using different approaches. For instance, Lokshin and Sajaia (2011) highlighted using two-step least square or maximum likelihood estimation. However, these estimation methods have been criticized for being inefficient in deriving consistent

standard errors (Abdulai & Huffman, 2014). Thus, to tackle this econometrics drawback, this study estimated the ESR model using the Full Information Maximum Likelihood (FIML) approach.

6.2.1.1 Model Specification

The ESR model follows a two-step estimation procedure whose first stage estimates a binary model that models selectivity. The selection/treatment equation is specified in Equation (6.1);

$$A_i^* = K_i\ \alpha + \varepsilon_i \tag{6.1}$$

Where;

A_i is a binary variable that equals 1 if a youth participated in the programme and 0 otherwise; α is the vector parameter to be estimated; K_i represents other covariates determining participation, such as the youth demographic characteristics (such as age, gender, education, marital status, household size, and type of employment), ownership of assets (such as personal and agribusiness); ε_i is the error term

The binary model used in the first stage distinguishes programme participants from non-participants. Based on this, participation decision was measured as a dichotomous variable that equals 1 if a respondent participated and 0 otherwise. From Equation (6.1), the reduced form of the participation equation can be specified as expressed in Equation (6.2)

$$A_i = \begin{cases} 1\ if\ \ A_i^* > 0 \\ 0\ \ otherwise \end{cases} \tag{6.2}$$

The Average Treatment Effect (ATE) of a linear regression that contains the endogenous binary-selection variable is estimated in the second stage. The outcome equations (in this case,

agripreneurship skills) corrected for endogenous participation for participants (regime 1) and non-participants (regime 2) are given as:

Regime 1: $Y_{1i} = \beta_1 X_{1i} + \sigma_{1\varepsilon}\hat{\lambda}_{1i} + \eta_{1i}$ if $A_i = 1$ (Participants) (6.3a)

Regime 2: $Y_{2i} = \beta_2 X_{2i} + \sigma_{2\varepsilon}\hat{\lambda}_{2i} + \eta_{2i}$ if $A_i = 0$ (non-Participants) (6.3b)

Where Y_i is the outcome variable, X_i represents the vector of explanatory variables, β and σ are the parameters to be estimated, $\hat{\lambda}$ [$\hat{\lambda}_1 = \frac{\phi(K_i\,\hat{\alpha})}{\varphi(K_i\,\hat{\alpha})}$ and $\hat{\lambda}_2 = \frac{\phi(K_i\,\hat{\alpha})}{1-\varphi(K_i\,\hat{\alpha})}$] is the Inverse Mill Ratio (IMR) computed from the selection equation to correct selection bias, η is the error term, and i represents each respondent surveyed. η_{1i} and η_{2i} are assumed to have a tri-variate normal distribution with zero mean and covariance matrix, Σ:

$$\Sigma = \begin{bmatrix} \sigma_{\varepsilon}^2 & . & . \\ \sigma_{\eta_1\varepsilon} & \sigma_{\eta_1}^2 & . \\ \sigma_{\eta_2\varepsilon} & . & \sigma_{\eta_2}^2 \end{bmatrix}$$

Where, σ_{ε}^2 is the variance of the error term in the assignment equation, $\sigma_{\eta_1}^2$ and $\sigma_{\eta_2}^2$ are variances of the error terms in the outcome equations, $\sigma_{\eta_1\varepsilon}$ and $\sigma_{\eta_2\varepsilon}$ are covariance of ε_i, η_{1i} and η_{2i} respectively. According to Mojo *et al*. (2017), the covariance of the corresponding error terms is not defined since Y_{1i} and Y_{2i} are not observed simultaneously. This shows a correlation between the error terms of the outcome equation (η_{1i} and η_{2i}) and that of the selection equation (ε_i). Thus, the expected values of the truncated error terms $E(\eta_1 \mid A = 1)$ and $E(\eta_2 \mid A = 0)$ can be defined as:

$$E(\eta_1 \mid A = 1) = E(\eta_1 \mid \varepsilon > -K\alpha)$$

$$= \sigma_{\eta_1\varepsilon}\frac{\phi(K_i\,\hat{\alpha})}{\varphi(K_i\,\hat{\alpha})} \equiv \sigma_{\eta_1\varepsilon}\hat{\lambda}_1 \quad (6.4)$$

$$E(\eta_2 \mid A = 1) = E(\eta_2 \mid \varepsilon > -K\alpha)$$

$$= \sigma_{\eta_2\varepsilon} \frac{-\phi(K_i\,\widehat{\alpha})}{1 - \varphi(K_i\,\widehat{\alpha})} \equiv \sigma_{\eta_2\varepsilon}\hat{\lambda}_2 \qquad (6.5)$$

φ and ϕ, respectively, are the cumulative distribution function and probability density of the standard normal distribution. The inverse Mills ratio $\hat{\lambda}_1$ and $\hat{\lambda}_2$ (selectivity terms) is defined as the ratio of ϕ and φ, evaluated at $K\alpha$. A significant non-zero value of the covariance $\sigma_{\eta 1\varepsilon}$ and $\sigma_{\eta 2\varepsilon}$ implies that the selection and the outcome variables are correlated (Mojo *et al*., 2017) and, therefore, validates the use of the ESR model.

The essence of including the IMR derived in Stage 1 as an independent variable in Stage 2 is to correct for endogeneity arising from the participation decision. According to Aakvik *et al*. (2005), estimating the outcome variables without correcting for this possible endogeneity could result in biased outcome estimates. Thus, it is important to impose a justifiable exclusive restriction on the stage 2 equation (Burke *et al*., 2015). However, the instrument to include in the selection equation is expected to influence participation decisions and not the outcome variable.

The selection equation's dependent variable is participation, which indicates whether or not a youth participated in the programme. The dependent variable of the outcome equation is agripreneurship skills, quantified using a composite index. The explanatory variables constitute socioeconomic and demographic factors selected based on past studies (Nwibo *et al*., 2016).

The Average Treatment effect on the Untreated and Treated (ATU and ATT) was computed using the expected values of the dependent variable for participants and non-participants in counterfactual and actual scenarios presented in Equations (6.6) – (6.9):

$$E(Y_{1i}|\, A_i = 1, X_{1i}) = \beta_1 X_{1i} + \sigma_{\eta 1\varepsilon}\, \rho_1 \frac{\phi(K_i\, \widehat{\alpha})}{\varphi(K_i\, \widehat{\alpha})} \quad (6.6)$$

$$E(Y_{2i}|\, A_i = 0, X_{2i}) = \beta_1 X_{2i} - \sigma_{\eta 2\varepsilon}\, \rho_1 \frac{\phi(K_i\, \widehat{\alpha})}{(1-\varphi(K_i\, \widehat{\alpha}))} \quad (6.7)$$

$$E(Y_{2i}|\, A_i = 1, X_{1i}) = \beta_2 X_{1i} + \sigma_{\eta 2\varepsilon}\, \rho_2 \frac{\phi(K_i\, \widehat{\alpha})}{\varphi(K_i\, \widehat{\alpha})} \quad (6.8)$$

$$E(Y_{1i}|\, A_i = 0, X_{2i}) = \beta_2 X_{2i} - \sigma_{\eta 1\varepsilon}\, \rho_2 \frac{\phi(K_i\, \widehat{\alpha})}{(1-\varphi(K_i\, \widehat{\alpha}))} \quad (6.9)$$

Where ρ_1 and $\rho_2$are correlation coefficients between the error terms of the selection equation, ε_i and outcome equations η_1 and η_2.

The ATT is calculated as the difference between Equations 6.6 and 6.8 as specified in 6.10

$$\text{ATT} = E(Y_{1i}|\, A_i = 1, X_{1i}) - E(Y_{2i}|\, A_i = 1, X_{1i}) \quad (6.10)$$

The ATU is calculated as the difference between equations 6.7 and 6.9 as specified in 6.11

$$\text{ATU} = E(Y_{1i}|\, A_i = 0, X_{2i}) - E(Y_{2i}|\, A_i = 0, X_{2i}) \quad (6.11)$$

6.2.1.2 Measure of Agripreneurship Skills

This study adopted the six agripreneurship skill constructs developed by Mukembo (2017) to develop a composite index used to measure youth agripreneurship skills. The six constructs are modified to include (a) technical skills in terms of crop and animal production, (b) risk-taking propensity and endurance, (c) Innovativeness and ability to recognise opportunities, (d) leadership and ability to manage an agricultural venture (e) communication and marketing, and (f) control over resources and agricultural ventures, captures all the five categories described by De Wolf, Schoorlemmer and Rudmann (2007) and those discussed by Elmuti *et al*. (2012).

Based on this, twenty-seven items were assessed on five response categories, including 5 (Strongly Agree), 4 (Agree), 3 (Neutral/Undecided), 2 (Disagree), and 1 (Strongly disagree) and a composite agripreneurship skills index was developed. Following Ray *et al*. (2022), the agripreneurship skill index was generated using Equation 6.12. The index score, which ranges from 1-5 was categorized as follows; 1-2 (low), 3 (medium), and 4-5 (high). The questions asked are presented in Appendix 6A (Section L).

$$\text{ASI} = \frac{TSA}{Total\ items} \tag{6.12}$$

Where ASI = Agripreneurship Skill Index and TSA = Total score by an Agripreneur based on individual ranking

6.2.2 Study Area and Data Collection

Data utilized in this study were collected from young agripreneurs affiliated with the ENABLE-TAAT programme in Kenya, Nigeria, and Uganda. The programme was funded by the African Development Bank (AfDB) and led by the International Institute of Tropical Agriculture (IITA) to contribute to job creation, food and nutrition security, income generation and improved livelihoods of African youths. Specifically, the Programme aims to create decent employment opportunities for young men and women along priority agricultural value chains through improved technical and business skills for agripreneurship.

The survey was conducted between August and December 2021. Quantitative data were collected on important variables, including demographic information, agripreneurship training, and entrepreneurial skills related to agriculture. Data was also collected on socio-economic characteristics such as age, gender, education, and marital status. To achieve randomization, a multistage stratified random sampling technique was adopted in selecting the respondents. In

the first stage, the three countries previously mentioned were purposively selected based on important criteria set by the research team. Firstly, they were three of the pioneering countries in which the ENABLE-TAAT programme was conducted in 2018. The second criterion was related to the severity of unemployment and underemployment, while the third criterion was based on the relatively high number of programme participants compared to the other countries.

In the second stage, the study population was stratified into two groups; participants and non-participants, the participants being those who participated in the ENABLE-TAAT programme and the non-participants being other young agripreneurs who did not participate in the programme. The list of participants and non-participants, which served as the sampling frames, was obtained from the programme coordinating office in each country. The third stage involves randomly selecting youths from the two sampling frames to make a sample size of 1463, which was determined based on the method proposed by Yamane (1967). This sample size was proportionately shared among the three countries based on the number of participants and non-participants in each country.

The random selection of the participants and non-participants was done via random numbers generated using Microsoft Excel. A total of 1435 young agripreneurs who gave their full consent participated in the survey across the three countries. Out of this, responses were obtained from 400, 429, and 606 respondents in Kenya, Nigeria, and Uganda, respectively. This represents a 98 percent response rate which is sufficient for the analysis.

6.3 Results and Discussions

6.3.1 Agripreneurship Skill Index Scores by Country

Table 6.1 presents the agripreneurship skill index results calculated based on the 27 items assessed. The index ranges between 1 and 5 points, where scores below 3 points are classified as low, 3 points as medium, and above 3 as high. On average, participants and non-participants had a score of 4.45 and 4.07, respectively, indicating that both groups are highly skilled. This could be because the respondents are all young graduates between 18-35 years old. People in this age category are considered to be innovative and adventurous.

However, despite being in the same age category and having relatively high levels of education, participants had a higher significant score at $p<0.01$, which could have resulted from their participation in the ENABLE-TAAT programme. Similar results were obtained across the three countries, where participants had higher scores than non-participants.

Table 6.1. Comparison of Respondents' Agripreneurship Skill Index Scores by Country

Country	Participants	Non-participants	Difference	t-values
Pooled sample (n=1435)	4.45	4.07	0.38***	-15.34
Kenya (n=400)	4.26	4.02	0.24***	-6.00
Nigeria (n=429)	4.56	4.17	0.39***	-7.43
Uganda (n=606)	4.48	4.03	0.45***	-12.43

Notes: *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

6.3.2 Results of the ESR Model

Table 6.2 presents the estimation results for the ESR model. The perception of agripreneurship programmes was imposed as an exclusive restriction to identify the model.

Table 6.2. Results of the ESR Model

	Participation in training			Agripreneurship skills index			
	Pooled			Participants		Non-participants	
	n=1435			n=737		n=698	
Variables	Coef.	M.E.	S.E.	Coef.	S.E.	Coef.	S.E.
(Log)Age	-1.099***	-0.437***	0.230	0.095	0.098	0.106	0.146
Gender	-0.073	-0.029	0.070	0.019*	0.462	0.097**	0.045
Level of Education (1^0)	0.203***	0.084***	0.060	-0.080***	0.022	-0.048	0.042
Sector of Household head	0.053	0.024	0.079	0.121***	0.029	0.038	0.052
Agripreneurship experience	-0.057***	-0.023***	0.020	0.008	0.008	-0.007	0.012
Part-time engagement	-0.059	-0.025	0.083	0.015	0.030	0.089*	0.052
Access to training	-0.046	-0.019	0.080	0.095***	0.028	0.068	0.052
No of HH Agripreneurs	-0.053**	-0.019**	0.025	-0.003	0.010	0.045***	0.015
Business level	0.182**	0.070**	0.078	-0.086***	0.029	0.048	0.051
Current residence	0.183***	0.074***	0.062	0.075***	0.021	0.177***	0.046
Perception of training[10]	0.522***	0.167***	0.078				
Constant	2.638***		0.736	4.289***	0.289	3.163***	0.480
$\rho 1$, $\rho 2$				-0.339**	0.159	-0.402***	0.088
Chi2(1)	13.98***						

Notes: S.E. = Standard Error; M.E. = Marginal Effect, *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

The negative signs and significance of the covariance terms ($\rho 1$ and $\rho 2$) indicate the existence of self-selection in the decision to participate in the ENABLE-TAAT programme, implying that the participation decision is negatively correlated with the outcome variable

[10] Perception was included as an instrument to identify the selection equation. The validity test conducted shows that the F-statistic was above 10, suggesting that the instrument is strong. Also, the Anderson-Rubin chi-square and Basmann F-statistics were insignificant, suggesting that the instrument is valid

(agripreneurship skill index score). This means that training may not have the same effect on non-participants even if they had participated in the programme (Abdulai & Huffman, 2014). Also, the significance ($p<0.01$) of the likelihood ratio test indicates the existence of mutual dependence between the treatment and outcome equations of participants and non-participants. Based on these results, the null hypothesis of no correlation between the assignment (participation) and outcome (agripreneurship skill) equations was rejected, justifying the use of the ESR model.

6.3.2.1 Determinants of Youth Participation in the Programme

The estimates for the determinants of youth participation in agripreneurship empowerment programmes are presented in the second column of Table 6.2. The findings show that the perception of agripreneurship empowerment programmes, as the exclusive restriction imposed on the selection equation, had a positive and statistically significant (at $p < 0.01$) effect on participation. This implies that those who perceive training as beneficial and a means of skill acquisition are more likely to participate in the programme than those with negative perceptions.

According to Sinclair *et al*. (1994), perceptions, developed through observations and experience, shape the adoption and sustainability of interventions. This corroborates Mengistu and Assefa (2020), who argued that the participation and adoption process starts with a perception that there is a need for improvement or innovation. In essence, participation decision is shaped by the perceived utility an individual expects to gain from an intervention or programme. This aligns with Adeyanju *et al*. (2021) and Magagula and Tsvakirai (2020), who linked positive perceptions of agricultural programmes to increased participation in agricultural-related activities in Nigeria and South Africa, respectively.

The level of education was positive and significant at $p<0.01$, implying that more educated youths are more likely to participate in the programme. Accordingly, more educated people are drawn to innovative programmes such as the case study (Addo, 2018; Metelerkamp *et al*., 2019). This finding also points to the significant role of formal education in connecting young people to empowerment programmes that can improve their livelihood and economic status. However, this contradicts Adeyanju *et al*. (2021) who argued that highly educated youths are often in continuous search for formal employment and therefore, share productive time between job search and other activities which is likely to deprive them of the benefits embedded in agripreneurship empowerment programmes.

The significance and negative correlation between agripreneurship experience and participation suggests that more experienced youth may choose not to participate in the programme. This could be because more experienced youths, to some extent, may have some level of knowledge and technical skills required to run their businesses successfully. Hence, they may not see the need to participate in empowerment programmes. Furthermore, there may be a general misconception that such programmes are intended for beginners and start-ups. Such notions, however, should be discouraged, considering that agripreneurship is emerging and better practices are constantly being explored. As a result, those with such beliefs risk missing out on innovative methods that could improve agripreneurship skills and performance. Another reason could be the pattern of agricultural programmes in many developing countries, which take a one-size-fits-all approach (Adeyanju, Mburu, Mignouna *et al*., 2021).

Similarly, the results show that those with more agripreneurs in their households are less likely to participate in the programme. Even though this is surprising since information flows better among household members engaged in similar activities, it could be because they depend on

household agripreneurs for mentorship. Consistent with prior expectations, the business level at which a youth is operating had a positive and significant ($p<0.01$) correlation with participation. This suggests respondents at the start-up level are more likely to participate in empowerment programmes than those at growth or maturity levels. This could be attributed to the quest of start-ups to acquire more knowledge and skills based on the challenges associated with starting and running agribusinesses. It could also be attributed to the increased awareness that agricultural programmes could provide technical support, which could help overcome critical business challenges.

6.3.2.2 Factors Influencing Youth Agripreneurship Skills

Table 6.2 also presents the major factors that significantly influenced youth agripreneurship skills. This discussion focuses on the participants' significant results ($p<0.01$). Even though education is perceived to facilitate better performance, the conversing effect of formal education on participation and agripreneurship skills shows that higher levels of education may encourage participation but may not contribute to better agripreneurship skills. This implies that agripreneurship skills do not depend on formal education. This result, however, calls for further investigation.

The positive and significant relationship between the sector where the household head is employed and agripreneurship skills imply that having a household head engaged in agriculture could help to improve agripreneurship skills. This could be attributed to the informal training and experience gained via working with household heads, as seen in many farming households in Africa where children/household members work as paid/unpaid farm labour.

The positive and significant relationship between access to training and agripreneurship skills is expected. This is because most agricultural training focuses on helping participants develop relevant skills for personal and agribusiness development. Thus, those with access to such training could have acquired relevant agripreneurship skills through participation, hence their higher skill index. This corroborates Ray *et al*. (2022), who found that more agripreneurship training exposure enhances the ability of young farmers through capacity building.

The results also show that business level negatively and significantly (at $p < 0.01$) influenced agripreneurship skill level. As shown in Table 6.2, operating at the start-up level, which also denotes fewer years of agripreneurship experience, reduced agripreneurship skills score by 9 percentage points. Generally, young agripreneurs could gain more expertise and abilities with more years of agripreneurship experience (Ray *et al*., 2022). Thus, since start-ups have relatively fewer years of experience, they may lack the necessary skills compared to those operating at growth and maturity stages.

The location variable had a positive and significant influence on agripreneurship skills. The positive direction implies that residency in rural areas yields higher scores for participants. This could be because the bulk of agricultural programmes target rural residents since agriculture is the mainstay of the rural populace. This could have exposed them to more skill acquisition programmes than urban dwellers. The country-disaggregated results are presented in Appendix 6B.

6.3.3 Impact of Agripreneurship Empowerment Programme on Agripreneurship Skills

Table 6.3 presents the average treatment effect on the treated (ATT) and untreated (ATU), which shows the ENABLE-TAAT programmes' impact on youth agripreneurship skills. The

results reveal that programme participation significantly improved participants' skills and could potentially improve that of non-participants. Specifically, the programme's causal effect, as shown by the ATT, is 0.73, representing a 20-percentage point[11] increase in the score of participants compared to that of non-participants. In real terms, participants had better agripreneurship skills by almost 1-indexed point than the non-participants.

Table 6.3. Impact of the ENABLE TAAT Programme on Youth Agripreneurship Skills in Kenya, Nigeria, and Uganda

Country	Outcomes	Predictions		Treatment Effect
	Agripreneurship Skill index	Entrepreneurs	Non-entrepreneurs	
Pooled	ATT	4.45	3.72	0.73***
	ATU	4.63	4.07	0.56***
Kenya	ATT	4.41	3.64	0.77***
	ATU	4.60	4.00	0.59***
Nigeria	ATT	4.51	3.85	0.67***
	ATU	4.68	4.19	0.50***
Uganda	ATT	4.43	3.68	0.74***
	ATU	4.61	4.03	0.58***

Notes*:* *** denotes statistical significance at a 1% level of significance

The potential causal effect of programme participation for non-participants is 0.56, representing a possible 14 percentage point increase in non-participants' scores if they had participated in the programme. Similar results were obtained across the three countries, where participants had a significant ATT and ATU, revealing that participation improved skills and could potentially improve the skills of non-participants if they had participated in the programme.

[11] Percentage points are calculated as the difference between the actual score of participants and non-participants divided by the score of participants/non-participants as it applies

These findings are consistent with the view that agripreneurship can generate better economic outcomes for young people (AfDB, 2016; Hall, 2017; IFAD, 2019) since better skills will contribute to better agripreneurship performance. These results corroborate Ouko *et al*. (2022), who posit that effective capacity-building programmes can help young agripreneurs acquire the relevant skills needed to run and scale their businesses. Given this, there is an urgent need for hands-on-empowerment programmes that prioritize rural youth and young agripreneurs for better skills and business performance.

CHAPTER SEVEN

EVALUATION OF THE IMPACT OF THE ENABLE-TAAT PROGRAMME ON YOUNG AGRIPRENEURS JOB CREATION CAPACITY IN AFRICA IN KENYA, NIGERIA, AND UGANDA[12]

Abstract

With rising graduate youth unemployment and declining job prospects in the formal sector, more young graduates, particularly in rural areas have joined the agricultural sector. Also, employment discussions and strategies are increasingly focusing on how youth-owned agribusinesses can facilitate long-term job creation and contribute to revitalizing rural economies in the coming years, with evidence of increasing investment in youth agribusiness empowerment programmes across the African continent. In light of these changing employment dynamics, the study assessed the evolving role of youth and small agribusinesses in employment creation in Africa. Further, the study evaluated the impact of agribusiness empowerment programmes in unlocking the job creation capacity of young actors engaged in agribusiness, taking evidence from the youth component of the African Development Bank (AfDB) Technologies for African Agricultural Transformation (TAAT) programme, Empowering Novel Agribusiness-Led Employment (ENABLE) programme implemented in Kenya, Nigeria, and Uganda. A total of 1435 young actors, including 737 participants and 698 non-participants were surveyed across the three countries. An Endogenous Switching Model (ESM) was used to identify factors that determined programme participation, and factors influencing job creation, and assess the programme's impact on job creation capacity. The

[12] This chapter has been submitted to Social Sciences and Humanities Open as 'Unlocking the Job Creation Potentials of Young Agripreneurs: A Quasi-Experimental Study of The ENABLE Programme In Africa'

descriptive analysis validates the assumption of changing employment dynamics in the rural areas where youth-owned small agribusinesses hired an average of 4 employees. The ESR results show the significance of programme participation on the job creation capacity of youths across the three countries. Also, the results showed that non-participants could increase their job creation capacity if they had participated in the programme. Factors correlated with job creation include socio-economic, such as age and marital status, and business attributes including agribusiness experience, business level, income, and access to land. These results suggest that continuous concerted efforts on agribusiness empowerment will have a notable impact in generating more jobs and reducing the rates of unemployment, particularly among young people. The findings also suggest the need to promote youth employment in agribusiness in the study countries and elsewhere in Africa.

Keywords: Rural youths; young graduate; job creation; agricultural entrepreneurs; agribusiness programmes; Kenya; Nigeria; Uganda

7.1 Introduction

While Africa has sustained unprecedented economic growth, driven by strong domestic demand and improved macroeconomic management in the last two decades (African Development Bank, 2014), the continent continues to struggle with a rapidly growing youth population. According to the United Nations (2022), about 70 percent of the African population is below 30 years old, reflecting a serious issue of youth bulge which is likely to double by 2050 (Mastercard Foundation, 2018).

Even though this growing youth population could offer resources for economic transformation if their talents are well utilized in an expanding economy, the ground reality for many decades has been chronic youth unemployment and underemployment which continues to fuel economic stagnation, disillusionment, and social unrest (Yeboah & Jayne, 2018). This is because the labour market is generally skewed against young people, with very limited employment opportunities in the formal sector to absorb the rapidly growing working-age youth population (Abay *et al*., 2021; Cieslik *et al*., 2021; MacDonald & King, 2021). Consequently, the continent's economic growth has not been able to absorb enough young people into the labour force (African Economic Outlook Report, 2017).

According to Coulibaly and Page (2021), these ongoing issues have further slowed the continent’s structural transformation agenda and progress on poverty reduction. It is quite surprising that despite its global relevance, graduate youth unemployment rates in Africa are higher today than in previous years before the adoption of the SDGs, with projections of increasing youth unemployment over the next decades (O’Higgins 2020). These concerns are particularly pronounced in rural areas, where most of the World’s poor population reside and where the economy and job prospects remain dominated by agriculture (Simões & do Rio,

2020). Thus, strategies to address unemployment and its accordant undesirable outcomes, particularly among rural youths have remained on the priority list of many African governments and development partners for many decades. According to Fox and Gandhi (2021), at least 10 million new jobs must be created annually to balance the youth-adult ratio in the labour market.

A critical strategy to achieve this is by exposing rural youths to agricultural entrepreneurship[13], which has the potential to transform their economic condition and lift them from the vicious circle of poverty to become employers of labour rather than job seekers (AbuMezied, 2019; Narendran & Ranganathan, 2015; Rao & Kumar, 2016). Many authors have suggested that the rural economy, which is based on agriculture but encompasses much more, can offer millions of African youths sustainable farm and non-farm employment opportunities (Adeyanju *et al*. 2021; Adeyanju, Mburu, and Mignouna 2021; De Guzman *et al*. 2020; Filmer and Fox 2014; Yami *et al*. 2019). Specifically, these authors assume that agricultural transformation that incorporates one or more of the following: entrepreneurship, engagement with national and regional markets and value chains, increased use of technology, greater business orientation, and improved processing and value addition, will attract more youths into the agricultural sector.

Other authors have also attributed the motivation for youth agripreneurship to concerns about the industry's future in light of rising chronic disease rates that endanger ageing farming communities and food production in Africa (Nhamo and Chikoye 2017). Forecasts of a continued youth bulge further encourage the transfer of food production tasks to more youthful,

[13] Agricultural entrepreneurship is a concept that goes beyond conventional farming to link agriculture with entrepreneurship for profit-making.

active, and productive society members (Pindado and Sánchez 2017). Thus, in the face of rising graduate youth unemployment, declining formal employment, and increased innovation in the agricultural sectors, an increasing number of young graduates, particularly in rural areas have joined the agricultural sector (Anyidoho *et al*., 2012; Maïga *et al*., 2020; Thebe, 2018).

Notably, African youth participation in agribusiness has been rapidly increasing in recent years, with a high level of participation among older youths who are determined to create value, improve their economic status, and equally contribute to employment creation (Thebe, 2018). According to Potts (2013), the faltering and decline in urban economies in recent years has also facilitated a wave of urban-rural migration which has led to increased youth engagement in agribusiness. This corroborates Rietveld *et al*. (2020) who found that many young people return, either permanently or temporarily, to rural areas when they fail to fulfil their aspirations or simply when they run out of means to support their urban lifestyles.

With this influx of youths into the agricultural sector (Addo, 2018; Metelerkamp et al., 2019; Mulema et al., 2021), the economic landscapes in which rural farmers have traditionally operated are rapidly shifting (Jayne *et al*., 2018), and employment discussions are increasingly focusing on how youth-owned agribusinesses can facilitate long-term job creation in the coming years (Stangler & Litan, 2009). This is particularly relevant since the bulk of job creation comes from small businesses (Stangler & Litan, 2009), suggesting that informal job creation in rural areas may lie on young actors operating across different agricultural value chains in the coming years.

Based on this, African governments and their development partners have implemented strategies in the form of agribusiness empowerment programmes to help young graduates

develop relevant agribusiness and entrepreneurial skills to expand job opportunities in the informal agricultural sector (Yeboah & Jayne, 2018). The general idea is to raise a generation of young entrepreneurs, running and managing successful agribusinesses across different value chains and contributing to job creation within their communities (Magagula and Tsvakirai, 2020).

While these strategies have been successful in mobilizing youths into the agricultural sector and harnessing the entrepreneurship potentials of young actors, empirical evidence on how they harness their job creation capacity is limited (Diraditsile, 2020) with very little systematic research/data to inform/drive practical policy within the African context. Also, the role of agriculture and small agribusinesses in employment creation within a rapidly transforming Africa is poorly understood (Yeboah & Jayne, 2018).

This study examined the evolving role of small agribusinesses in employment creation in rural areas. Specific knowledge regarding how youth-owned agribusinesses contribute to job creation will help to better understand how young people engage with the rural economy. Secondly, it identified the factors that influence youth participation in agribusiness empowerment programmes and assessed the role of these programmes in unlocking the job creation potentials of young actors, taking evidence from the ENABLE-TAAT programme implemented in Kenya, Nigeria, and Uganda.

This evidence is important for designing and implementing better policies and programmes that address the needs of young agribusiness owners, particularly in the rural context. The study breaks new ground in two ways: First, it provides evidence on the contribution of young graduates to job creation in three African countries, assessing whether they hire employees or

not. Further, the average number of paid employees they hire, disaggregated by two age categories (youth and adult) was assessed. The study, therefore, makes significant contributions to the emerging research on the relevance of the agricultural sector in generating sustainable employment for African youths. Second, the study compared the job creation capacity of participants and non-participants of the ENABLE-TAAT programme across the three countries using a rigorous methodology to assess the comparativeness of what works in different African countries, thereby generating empirical evidence which can inform national and regional practical policymaking on youth engagement in agriculture.

The rest of the paper is structured as follows: The ENABLE-TAAT programme is presented in section 7.2. The data and analytical methods used are described in section 7.3. Section 7.4 summarizes the main findings, beginning with the broad demographic and employment characteristics of youths and then assessing the impact of programme participation on the likelihood and number of jobs created. Section 7.5 concludes by summarizing the key findings and their implications.

7.2 The Intervention: ENABLE-TAAT Programme

The ENABLE-TAAT programme is an Africa-wide programme initiated to involve youth, aged 18-35 years, in the process of agricultural transformation and help tackle youth unemployment in Africa. It is one of 15 Compacts covering the Technologies for African Agricultural Transformation (TAAT) programme, which was funded by the African Development Bank (AfDB) and led by the International Institute of Tropical Agriculture (IITA) through its youth in agribusiness initiative (IITA, 2020).

The main objective includes improving youth capacity and transforming their attitude towards agribusiness. To achieve this, participants were trained along different agricultural value chains and supported to develop sustainable agribusinesses. Also, beneficiaries received mentorship from experts in their chosen agro-enterprise. Additionally, youths were supported to identify and scale lucrative opportunities within nine significant commodity value chains of the programme and linked to relevant credit sources to aid business expansion. This is to ensure that, in addition to being sustainably employed, they can also generate employment opportunities for their peers and other people.

The 3-year programme was implemented across 19 African countries: the Democratic Republic of Congo (DRC), Kenya, Nigeria, Tanzania, Uganda, and Zambia between 2018-2021. The programme provided intensive three-month training, as well as continued mentorship and technical assistance to 4398 youths across Africa (IITA, 2020). With regards to the study locations, a total of 1384 youths, 344, 440, and 600 beneficiaries from Kenya, Nigeria, and Uganda, respectively participated in the programme in 2018. A sub-sample of these youths participated in the current study.

7.3 Materials and Methods

7.3.1 Empirical Strategy

According to Läpple and Hennessy (2015), measuring the impact of programmes is a complicated task as impact assessment is generally hampered by selection and endogeneity bias that comes with participation. It is clear that estimating the impact of empowerment programmes on job creation outcomes (i.e., probability of hiring an employee and number of employees hired), based on nonexperimental methods, is not trivial. This is because the

outcomes of participants cannot be observed in case they did not participate. This creates a counterfactual issue that cannot be addressed using an Ordinary Least Square (OLS) method.

While this issue can be addressed using an experimental design, whereby treatment (participation) is randomly assigned to control and treatment groups, individuals make participation decisions based on the level of utility expected from the programme. In essence, only those with positive expectations would likely participate in the programme. Hence, participation is not randomly assigned to the two groups (participants and non-participants), indicating that both groups may be systematically different based on observed and unobserved characteristics. This is a major issue in impact assessment which has been widely discussed in the literature.

To address these biases, some authors have proposed and adopted different econometric methods, including the Heckman selection model, propensity score matching method, and endogenous treatment models that can be fit for one branch (treatment and outcome models equations) or through simultaneous maximum likelihood estimations (e.g., Heckman probit model). However, some of these models have been criticized for being inefficient and restrictive in that they assume that the coefficients in the outcome equations for both participants and non-participants are equal (Aakvik *et al*., 2005; Démurger and Li, 2013).

In addition, some of these methods require complicated adjustments to yield consistent standard errors e.g., the biprobit and heckprobit models (Aakvik *et al*., 2005; Démurger and Li, 2013). However, the endogenous switching model, on the other hand, helps to address the issues of endogeneity and self-selectivity by implementing the full information maximum likelihood approach to simultaneously estimate a binary selection and linear outcome models

to yield consistent standard errors of the estimates (Lokshin and Sajaia, 2011). This approach relies on an assumption of joint normality of the error terms in the selection and outcome equations. Other studies have applied this model to assess the impact of programme participation on economic and livelihood outcomes (Aakvik *et al*., 2005; Démurger and Li, 2013; Wossen *et al*., 2017; Issahaku & Abdul-Rahaman, 2019).

Two main objectives were addressed using this empirical estimation. The study adopted both the endogenous switching probit regression (ESPR) model, which estimates a binary selection and binary outcome equation, and the Endogenous Switching Treatment Effect Regression (ESTER) model which similarly estimates a binary selection, but a continuous outcome equation. Regardless of the nature of the outcome variables, both models derive the Average Treatment Effects (ATE), the Average Effects of Treatment on the Treated (ATT) and the Average Effects of Treatment on the Untreated (ATU).

The need to specify two different models (ESPR and ESTER) is based on the nature of the outcome variables. While the specification of both models is the same, the nature of their outcome variable is different. For the switch probit model, the outcome variable is dichotomous, taking the value of 1 if an agripreneur has an employee and 0 otherwise. The outcome of the ESTER is continuous, measured in terms of the number of additional jobs created (number of employees).

7.3.3.1 Model specification: Endogenous Switching Model (ESPR and ESTER)

Consider a regime, P_i which denotes whether an agripreneur has participated in the ENABLE-TAAT programme or not. The participation model, otherwise known as the selection equation, is specified as:

$$P_i^* = Z_i\ \alpha + \mathcal{E}_i \quad (7.1)$$

Where;

P_i is a dichotomous variable that equals 1 for programme participants and 0 for non-participants; α is the vector parameter to be estimated; Z_i denotes other explanatory variables that influence participation decisions; $\mathcal{E}_i$ is the disturbance term

The reduced form of Equation 7.1 can be specified as;

$$P_i = \begin{cases} 1\ if\ \ P_i^* > 0 \\ 0\ \ otherwise \end{cases} \quad (7.2)$$

The outcome equations for participants and non-participants are specified in Equations (7.3) and (7.4), respectively.

Regime 1: $Y_{1i} = \beta_1 X_{1i} + \eta\hat{\lambda}_{1i} + \mu_{1i}$ if $P_i = 1$ (Participants) (7.3)

Regime 2: $Y_{2i} = \beta_2 X_{2i} + \eta_{2\varepsilon}\hat{\lambda}_{2i} + \mu_{2i}$ if $P_i = 0$ (Non-Participants) (7.4)

Where Y_i is the outcome variable, X_i represents the vector of explanatory variables, β, and μ are the parameters to be estimated, $\hat{\lambda}$ [$\hat{\lambda}_1 = \frac{\phi(Z_i\,\hat{\alpha})}{\varphi(Z_i\,\hat{\alpha})}$ and $\hat{\lambda}_2 = \frac{\phi(Z_i\,\hat{\alpha})}{1-\varphi(Z_i\,\hat{\alpha})}$] is the Inverse Mill Ratio (IMR) computed from the selection equation to correct for selection bias, and η is the error term. μ_{1i} and μ_{2i} are assumed to have a tri-variate normal distribution with zero mean and covariance matrix, Σ:

$$\Sigma = \begin{bmatrix} \sigma_\varepsilon^2 & . & . \\ \sigma_{\mu_1\varepsilon} & \sigma_{\mu_1}^2 & . \\ \sigma_{\mu_2\varepsilon} & . & \sigma_{\mu_2}^2 \end{bmatrix}$$

Where σ_{ε}^{2} is the variance of the error term in the assignment equation, $\sigma_{\eta_1}^{2}$ and $\sigma_{\eta_2}^{2}$ are variances of the error terms in the outcome equations, $\sigma_{\mu_1\varepsilon}$ and $\sigma_{\mu_2\varepsilon}$ are covariance of ε_i and $\mu_{is.}$ According to Adela and Aurbacher (2018), the covariance of the corresponding error terms is not defined since Y_{1i} and Y_{2i} are not observed simultaneously. This shows a potential correlation between the error terms of the outcome equation (μ_{1i} and μ_{2i}) and that of the selection equation (ε_i). Thus, the expected values of the truncated error terms, $E(\mu_1 \mid P{=}\,1)$ and $E(\mu_2 \mid P = 0)$ can be defined as:

$$E(\mu_1 \mid P = 1) = E(\mu_1 \mid \varepsilon > -Z\alpha) = \sigma_{\mu_1\varepsilon}\frac{\phi(Z_i\,\hat{\alpha})}{\varphi(Z_i\,\hat{\alpha})} \equiv \sigma_{\mu_1\varepsilon}\hat{\lambda}_1 \qquad (7.5)$$

$$E(\mu_2 \mid P = 0) = E(\mu_2 \mid \varepsilon > -Z\alpha) = \sigma_{\mu_2\varepsilon}\frac{-\phi(Z_i\,\hat{\alpha})}{1-\varphi(Z_i\,\hat{\alpha})} \equiv \sigma_{\mu_2\varepsilon}\hat{\lambda}_2 \qquad (7.6)$$

φ and ϕ, respectively, are the cumulative distribution function and probability density of the standard normal distribution. The Inverse Mills Ratio (IMR) $\hat{\lambda}_1$ and $\hat{\lambda}_2$ (selectivity terms) is defined as the ratio of ϕ and φ, evaluated at $Z\alpha$. A significant non-zero value of the covariance $\sigma_{\mu_1\varepsilon}$and $\sigma_{\mu_2\varepsilon}$ implies that the selection and the outcome variables are correlated (Adela & Aurbacher, 2018) and therefore, validates the use of the switching models.

The essence of including the IMR derived in the first stage as an independent variable in stage 2 is to correct for endogeneity arising from participation decisions. According to Aakvik *et al*. (2005), estimating the outcome variables without correcting for this possible endogeneity could result in biased estimates. Thus, it is important to impose a justifiable exclusive restriction in the stage 1 equation (Burke *et al*., 2015). The instrument(s), however, is(are) expected to influence participation decisions, but not the outcome variables. In this study, perception of agribusiness empowerment interventions/programmes was included as an instrument to

identify the selection/participation equation. Other authors have identified this variable as a strong determinant of programme participation (Adeyanju *et al*., 2021; May *et al*., 2019; Mishra *et al*., 2018). Thus, it is hypothesized that while programme perceptions may directly influence youths' decision to participate in the ENABLE-TAAT programme, it does not have a direct correlation with job creation capacity, except through programme participation. The tests of the strength of the relationship between this instrument and the participation variable supported its reliability and validity as a strong instrument. Specifically, the Anderson-Rubin chi-square and Basmann F-statistics were both insignificant, suggesting that the instrument is valid.

The dependent variable of the selection equation is participation which denotes whether a youth participated in the programme or not. The dependent variables of the outcome equations are the probability of having an employee and the number of employees. The explanatory variables constitute socioeconomic and demographic factors selected based on past studies (Addo, 2018; Barau & Adesiji, 2018; Nwibo *et al*., 2016).

The Average Treatment effect on the Untreated and Treated (ATU and ATT) was computed using the expected values of the dependent variable for participants and non-participants in counterfactual and actual scenarios presented in Equations (7.7) to (7.10):

$$E(Y_{1i}|\, P_i = 1, X_{1i}) = \beta_1 X_{1i} + \sigma_{\mu_1 \varepsilon}\, \rho_1 \frac{\phi(Z_i\, \widehat{\alpha})}{\varphi(Z_i\, \widehat{\alpha})} \tag{7.7}$$

$$E(Y_{2i}|\, P_i = 0, X_{2i}) = \beta_1 X_{2i} - \sigma_{\mu_2 \varepsilon} \rho_1 \frac{\phi(Z_i\, \widehat{\alpha})}{(1-\varphi(Z_i\, \widehat{\alpha})} \tag{7.8}$$

$$E(Y_{2i}|\, P_i = 1, X_{1i}) = \beta_2 X_{1i} + \sigma_{\mu_2 \varepsilon}\, \rho_2 \frac{\phi(Z_i\, \widehat{\alpha})}{\varphi(Z_i\, \widehat{\alpha})} \tag{7.9}$$

$$E(Y_{1i}|\, P_i = 0, X_{2i}) = \beta_2 X_{2i} - \sigma_{\mu_1 \varepsilon}\, \rho_2 \frac{\phi(Z_i\, \widehat{\alpha})}{1-\varphi(Z_i\, \widehat{\alpha})} \tag{7.10}$$

Where ρ_1 and $\rho_2$are correlation coefficients between the error terms of the selection equation, ε_i and outcome equations μ_1 and μ_2.

The ATT is calculated as the difference between Equations 7.7 and 7.9 as specified in 7.11

$$\text{ATT} = E(Y_{1i}|\, P_i = 1, X_{1i}) \; - \; E(Y_{2i}|\, P_i = 1, X_{1i}) \tag{7.11}$$

The ATU is calculated as the difference between Equations 7.8 and 7.10 as specified in 7.12

$$\text{ATU} = E(Y_{1i}|\, P_i = 0, X_{2i}) - E(Y_{2i}|\, P_i = 0, X_{2i}) \tag{7.12}$$

7.3.2 Survey Design and Data

The study's analysis draws from the Young Agribusiness Survey (YAS) dataset collected under the 'ENABLE TAAT' project sponsored by the African Development Bank (AfDB) and facilitated by the International Institute of Tropical Agriculture (IITA). The survey was conducted in Kenya, Nigeria, and Uganda between August – December 2021. The primary survey was conducted in two stages.

First, a reconnaissance survey was conducted by a team of researchers to have a broader understanding of the programme and its beneficiaries in the survey countries. During this exploratory survey, discussions were held with different stakeholders including the programme coordinators, participants, and non-participants affiliated with IITA. The findings from this survey were used to refine the study objectives, sampling methods, and survey instrument. A formal survey instrument that captured socioeconomic and demographic information, programme participation, job creation, and other relevant variables was programmed on the Open Data Kit (ODK) and data was collected by trained enumerators via personal interviews using phones and Tablets.

The sampling framework is based on a multistage stratified random sampling technique whose first stage involves purposively selecting the three countries previously mentioned based on three major criteria defined by the research team. First, they had a relatively higher number of participants compared to the other countries in which the programme was conducted. Second, they rank high among the countries with severe youth unemployment and underemployment. Third, they were three of the pilot countries. Also, an important component of this survey was to have a reference in data from at least two regions in Africa.

Secondly, the study population was stratified into two groups based on participation status, i.e., participants and non-participants, the former being those who participated in the ENABLE TAAT programme in 2018 and the non-participants being other young agripreneurs who were affiliated with IITA at the time of the survey but, did not participate in the programme. The list of participants and non-participants, which served as the sampling frames, was obtained from the programme coordinating office in each country.

The third stage involves the random selection of agripreneurs from the two sampling frames to make a sample size of 1461 following Yamane (1967). This sample size was proportionately shared among the three countries based on the sampling frame. The random selection of the participants and non-participants was done via random numbers generated via Microsoft Excel. A total of 1435 respondents were surveyed across the three countries. This includes 400 respondents (183 participants and 217 non-participants) from Kenya, 429 respondents (230 participants and 199 non-participants) from Nigeria, and 606 respondents (324 participants and 282 non-participants) from Uganda.

7.3.3 Measure of Job Creation

Following Fowler and Markel (2014), job creation was directly measured by asking agripreneurs the number of employees they have hired in the last 12 months. According to the authors, this method facilitates obtaining estimates that could be attributed to programme interventions. Thus, the job creation capacity of each agripreneur was measured by the sum of all jobs created in each venture following the programme.

7.4 Results and Discussions

7.4.1 Job Creation Attributes of the Respondents

Results presented in Table 7.1 detail the job creation capacity of the agripreneurs. The analysis showed that about 47 percent of the participants had employees compared to 32 percent of the non-participants. A further investigation into the number of people hired by each category shows that participants had more employees (an average of 5 persons) than non-participants. Also, participants hired more young and female employees than non-participants. This indicates that participants have higher job creation capacity than non-participants, most likely because the programme harnessed their job creation capacity.

Also, given the positive and significant impact of agripreneurship skills, the programme could have facilitated business expansion and partnerships, thereby creating an increased need for labour. This is further investigated in the major objective which looks at the programme's impact on job creation capacity. Country analysis shows similar results across the three countries. For instance, in Kenya, participants had 2 additional employees than non-participants. On gender, both groups hired more males than females. However, both groups hired at least one female employee. This suggests the possible existence of gender gaps in youth employment patterns.

Table 7. 1. Job Attributes of the Youths in Kenya, Nigeria, and Uganda

Variable	Pooled			Kenya			Nigeria			Uganda		
	P	NP	t-values	P	NP	t-values	P	NP	t-values	P	NP	t-values
Have Employees (%)	0.47	0.32	-6.04	0.40	0.28	-2.50	0.45	0.26	-4.20	0.53	0.39	-3.51
Number of employees	4.67	3.11	-10.80	4.53	2.69	-5.97	4.59	3.00	-6.34	4.77	3.39	-6.54
Number of young employees	3.95	2.64	-11.17	3.73	2.21	-6.74	4.09	2.73	-5.62	3.96	2.83	-6.82
Number of female employees	1.35	1.08	-2.16	0.92	0.67	-1.01	1.34	0.84	-2.23	1.54	1.42	-0.63

Notes: P=Participants; NP=Non-participants

7.4.2 Impact of Programme Participation on the Probability of Job Creation

Table 7.2 shows the impact estimates obtained from the ESPR model for the probability of job creation. The ATT shows the impact of participation on the likelihood of job creation for participants, the ATU shows the impact of participation on the likelihood of job creation for non-participants if they had participated in the programme (counterfactual scenario), while the ATE shows the effect of programme participation on the likelihood of job creation for a randomly selected young agripreneur. The coefficients of all the treatment effects are positive and significant at 1 percent, indicating that agribusiness empowerment programmes are important for promoting job creation among young people.

Table 7.2. Impact of the ENABLE TAAT Programme on the Likelihood of Job Creation in Kenya, Nigeria, and Uganda

Treatment effects	Pooled (n= 1435)	Kenya (n=400)	Nigeria (n=429)	Uganda (n=606)
ATT	0.13^{***} (0.08)	0.09^{***} (0.08)	0.10^{***} (0.07)	0.18^{***} (0.07)
ATU	0.28^{***} (0.14)	0.32^{***} (0.14)	0.24^{***} (0.12)	0.29^{***} (0.13)
ATE	0.20^{***} (0.08)	0.21^{***} (0.08)	0.18^{***} (0.08)	0.22^{***} (0.08)

Notes: Standard error in parenthesis; p >0.1= *, p>0.05= **, p>0.01= ***

The ATE shows that participation increased the probability that a random young agripreneur will hire an employee by 20 percent. The ATT shows that participants had a 13 percent higher likelihood of hiring an employee than non-participants. Similarly, the ATU shows that non-participants would have had a 28 percent higher probability of hiring an employee if they had participated in the programme. Based on these findings, it can be concluded that participation in the ENABLE-TAAT programme increased the job creation potential of participants and could have had a higher effect on non-participants if they had participated.

The country disaggregation shows that the ATT is highest in Uganda and lowest in Kenya. This implies that the programme had more impact in Uganda compared to the other countries (Nigeria and Kenya). Specifically, the value and significance of the ATT estimates show that participants had a 9 percent, 10 percent, and 18 percent higher likelihood of creating jobs in Kenya, Nigeria, and Uganda, respectively. The higher impact estimate in Uganda could be attributed to the different support that participants received from the Ugandan government during and beyond the programme implementation.

Conversely, the value of the ATU is higher in Kenya than in the other two countries, implying that non-participants in Kenya could have a higher probability of creating jobs if they had participated in the programmes. Overall, these results show that the programme had positive and significant impacts across the three countries, suggesting their relevance to the job creation agenda of African countries. These results also agree with Meemken and Bellemare (2020) who found that innovative agricultural programmes increase farmers' demand for hired labour.

7.4.3 Impact of Programme Participation on Job Creation Capacity

Table 7.3 presents the average number of jobs created by agripreneurs under actual and counterfactual scenarios. Cells (a) and (d) present the average number of jobs created by participants and non-participants, respectively, showing a higher average for participants than non-participants for the pooled sample and in the three countries. However, such direct comparisons could be misleading in attributing the difference in the number of jobs created entirely to participation in the ENABLE-TAAT programme.

Table 7.3. Impact of Programme Participation on Job Creation Capacity

	Pooled			Kenya			Nigeria			Uganda		
	P	NP	TE	P	NP	TE	P	NP	TE	P	NP	TE
Participants (ATT)	(a)4.67	(c)4.20	0.47***	4.55	3.90	0.65***	4.63	3.98	0.65***	4.74	4.45	0.29***
Non-participants (ATU)	(b)4.90	(d)3.12	1.78***	4.89	3.05	1.84***	4.97	3.09	1.87***	4.86	3.14	1.72***
Heterogenous effect (TH)	0.23	1.08	-1.31***	0.34	0.85	-1.19***	0.34	0.89	-1.22***	0.12	1.31	-1.43***

Notes: P=participants; NP= non-participants; TE= treatment effects; p >0.1= *, p>0.05= **, p>0.01= ***

The last column for each category (pooled and specific country) in Table 7.3 presents the treatment effects of programme participation on the number of jobs created. In the counterfactual case, cell (c) for the pooled sample, the number of jobs created by agripreneurs who participated in the programme would have reduced by about 11 percent if they had not participated in the programme. The positive and significant mean difference between scenarios (b) and (d) for non-participants indicates similar counterfactual results, indicating that non-participants would have increased their job creation capacity by about 36 percent if they had participated in the programme.

While the impact estimates differ, similar results were obtained in the three countries. The impact estimate was highest in Kenya, showing that the job creation capacity of participants increased by 17 percent, and lowest in Uganda, where the result shows a 6 percent increase in the number of jobs created by the participants. Likewise, the results show that non-participants in Kenya, Nigeria, and Uganda, respectively, would have increased their job creation capacity by about 60 percent if they had participated in the programme.

These results show that overall, programme participation significantly increased the job creation capacity of agripreneurs across the three countries. However, the negative transitional heterogeneity (TH) effect (Table 7.3) implies that the impact of the programme is lower for participants relative to non-participants. This implies that participation would have had a higher impact on the number of jobs created by non-participants than participants if they were to participate in the programme. These results, therefore, indicate that continuous concerted efforts by government and development partners on agripreneurship empowerment will have a notable impact in generating more jobs and reducing the rates of unemployment, particularly among young people.

7.5 Factors Influencing Job Creation Capacity

Table 7.4 presents the first results of the ESTER model which identifies other factors influencing job creation capacity. The Wald test is significant at 5 percent, indicating the fitness of the model. However, it implies an issue of endogeneity, thereby justifying the use of the ESTER model. Also, the likelihood ratio test of independence of the participation and job creation equations suggests that the null hypothesis of no correlation between the two equations can be rejected since they are positively correlated.

Table 7. 4. Determinants of the Job Creation Capacity of Youths in Kenya, Nigeria, and Uganda

	Participants		Non-participants	
	Coef.	S. E	Coef.	S. E
(Log)Income	0.649***	0.232	0.691*	0.369
Age	0.372*	0.218	0.037	0.388
Household size	-0.028	0.041	0.010	0.058
Marital status	-0.412**	0.189	-0.273	0.300
Education	0.015	0.139	0.268	0.203
Experience (years)	0.078*	0.045	0.113*	0.067
Type of engagement	0.256	0.194	0.184	0.307
Business level	0.332**	0.171	-0.271	0.259
Access to credit	-0.101	0.218	0.812**	0.370
Access to technology	0.002	0.002	0.003	0.003
Economic condition	0.072	0.084	0.097	0.158
Access to land	0.506**	0.253	0.166	0.447
Constant	-2.311	1.902	-3.468	2.736
Rho	-0.117	0.137	0.296**	0.14423
LR chi2(1) =3.76; Prob>chi2= 0.052				

Notes: Coef. = Coefficient; S. E= Standard error; p >0.1= *, p>0.05= **, p>0.01= ***

The results indicate that only two variables – income and years of agribusiness experience– are statistically significant and have a common positive correlation with the number of jobs created for both participants and non-participants. This seems logical since higher income could imply a larger business scale or in other cases could contribute to business expansion. This corroborates Unay-Gailhard and Bojnec (2019) who found that an increase in income positively affects farmers' behaviour regarding the demand for on-farm labour, particularly if more labour is required to increase production without additional capital investment.

Also, more years of experience implies more years of business operation and possibly larger businesses which could naturally require more employees or hired labour. However, other factors independently influenced the job creation capacity of each group. For participants, age was positively and significantly related to the number of jobs created, implying that being older increases job creation capacity. This seems intuitive since age could be a proxy for experience. Longer years of business operation could imply operating above start-up levels which requires additional labour.

The negative sign and significance of marital status for participants imply that being married reduces job creation capacity. A possible explanation for this could be attributed to more access of married people to unpaid family labour since spouses and children could help to run/manage business operations. However, the contradictory sign between marital status and the probability of job creation and the number of jobs created implies that the likelihood of job creation may not translate into eventually hiring an employee. These results call for a more in-depth review to better understand these dynamics.

The business level at which a participant is operating and access to land had positive and significant correlations with the number of jobs created, implying that those operating at growth levels have more employees than those at start-up levels. This could be attributed to business expansion as youths move up the business cycle. Also, access to land could imply the cultivation of more acreage which requires paid labour. Operating at higher business levels and cultivating more hectares of land are closely related to business expansion and more production. The results also show that access to credit has a positive and significant correlation with the number of jobs created for non-participants. However, it was insignificant for participants.

CHAPTER EIGHT

EVALUATION OF THE IMPACT OF THE ENABLE-TAAT PROGRAMME ON YOUTH LIVELIHOODS IN KENYA, NIGERIA, AND UGANDA[14]

Abstract

This study generates evidence to understand the impact of agribusiness empowerment programmes on youth livelihoods in developing countries based on the ENABLE-TAAT programme implemented in Kenya, Nigeria, and Uganda. A multistage sampling technique was used in obtaining primary agribusiness-level data from a sample of 1435 young agripreneurs from the study countries. An Endogenous Treatment Effect Regression (ETER) model was used to assess the impact of programme participation on youth livelihoods (income and food security). Results show that participation significantly increased youth's agripreneurship income by 7 percent and improved food security by 75 percent for the pooled analysis. The country disaggregation results show that participation led to a 54 percent and 37 percent increase in the income of participants in Nigeria and Uganda, respectively. Also, positive and significant impacts were obtained for food security in the two East African countries. These findings suggest policy interventions or programmes focusing on youth agribusiness empowerment, particularly those that target young actors along different agricultural value chains. The study also suggests interventions geared towards mitigating constraints to credit access and productive resources by young agripreneurs to ease barriers to working capital and business innovation.

Keywords: Agribusiness programmes; Youth livelihoods; Kenya; Nigeria; Uganda

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8.1 Introduction

Africa has the youngest population in the World, with about 70 percent of its population below 30 years old (United Nations, 2022). While this could be an economic asset in terms of human resources, many scholars have described it as a ticking time bomb waiting to explode (Adeyanju *et al*., 2020; Baah-Boateng, 2016). This is because if Africa fails to generate appropriate economic possibilities for youths to earn a modest living, surging unemployment rates will continue to fuel criminality, insurgency, violent conflicts, religious radicalization, and sexual exploitation, among others (Williams, 2016).

Youth bulge and unemployment are two terms that must not go hand in hand because a continuous increase in the youth population must be accompanied by sufficient employment opportunities for nation-building and economic development. However, like in every other part of the world, the narrative is sardonic in Africa. According to the International Labor Organization (ILO) (2020), the estimated 440 million youths expected to join the labour market by 2030 may pose a significant development challenge in Africa due to declining and limited economic and livelihood opportunities for young people (De Pinto & Ulimwengu, 2017).

In tackling the issue of unemployment and its accordant undesirable outcomes, scholars and development partners have highlighted the importance of youth entrepreneurship in agriculture, otherwise known as agripreneurship (Filmer & Fox, 2014; World Bank, 2013). Agripreneurship describes a profitable linkage between agriculture and entrepreneurship (Bairwa *et al*., 2014), whereby a farmer, regarded as an agripreneur, applies innovative and creative methods to agricultural activities while constantly taking calculated risks and looking for ways to improve farm business to generate more income and make profits (Njagi, 2020). The potential of agripreneurship in generating sustainable employment opportunities for young

people, lifting youth out of poverty, preserving the agricultural labour force, and contributing to food security has been widely discussed in the literature (Afrad, 2017; Akrong & Kotu, 2022; Bairwa *et al*., 2014; Magagula & Tsvakirai, 2020; Ouko *et al*., 2022).

While the concept of youth agripreneurship is emerging, African governments have shown their commitment to harnessing youth agripreneurship intention and improving the performance of youth-owned agro-enterprises (Yami *et al*., 2019). These commitments are evident in various initiatives and interventions implemented in recent years to expose youth to agribusiness value chains and different profitability mechanisms. Examples include the Youth Inspiring Youth in Agriculture (YIYA) Initiative in Uganda (Ose, 2021), the Kenya Youth Agribusiness Strategy (Ouko *et al*., 2022), and the Empowering Novel Agribusiness-Led Employment (ENABLE) programmes implemented in 19 African countries. These interventions have included skills development, ensuring youth access to productive resources, and training on modern technologies (Yami *et al*., 2019).

In response to these efforts, many young people have come to realize the benefits embedded in agripreneurship as a sustainable means of livelihood (Mulema *et al*., 2021) and stepped off the long unemployment queue to embrace agripreneurship careers, engaging along various agricultural value chains, either as a necessity due to inability to secure gainful employment in other sectors or out of passion (Yami *et al*., 2019). For instance, in Uganda, approximately 55 percent of the youths in rural areas engage in agriculture as a means of livelihood (Ose, 2021). This has further raised a continued interest in interventions that could improve the performance and raise the productivity of young agripreneurs.

Specifically, the relevance of agribusiness empowerment programmes to youth engagement in agripreneurship has received significant attention in global agenda and literature in recent years (Bello *et al*., 2021; Lachaud *et al*., 2018; Ogunmodede *et al*., 2020). For instance, Adeyanju *et al*. (2021) found that participation in the Fadama Graduate Unemployed Youth Women Support (FGUYS) programme in Nigeria improved the performance of youth-owned agribusinesses. Moore (2015) found that training on the efficient use of financial resources helps in funds management, while entrepreneurship training helps participants to better understand their business environment and create better bankable business plans.

Overall, the theoretical implications of these programmes for policymaking have been well studied, with primarily descriptive, classificatory, and often historical literature (Akrong *et al*., 2020; Akrong & Kotu, 2022; Babu and Zhou, 2020; Ray, *et al.*, 2022; Yami *et al*., 2019). Also, most existing empirical literature on agribusiness empowerment programmes is preoccupied with the factors influencing participation, intention to engage in agribusiness, and youth perception of agriculture (Adeyanju *et al*., 2021; Magagula & Tsvakirai, 2020; Mulema *et al*., 2021; Scoones *et al*., 2016). Those that addressed the impacts of agricultural-related programmes in Africa primarily focused on farming households with little reference to youth (Korth *et al*., 2014; Sikwela & Mushunje, 2013; Todo & Takahashi, 2013) who are exposed to intense labour market challenges. Overall, there are few rigorous impact evaluation studies on the performance of youth-owned agro-enterprises in Africa (Adeyanju, Mburu, & Mignouna, 2021; Lachaud *et al*., 2018).

Thus, despite the importance of youth agribusiness empowerment programmes for host countries and development agencies, the impact of such efforts remains poorly understood, both at national and regional levels (Lachaud *et al*., 2018; Stewart *et al*., 2015). Specifically,

there is little empirical evidence to facilitate the debates on programme impacts and their implications for local and regional policymaking. Also, it is worth noting that there have been few country-specific attempts to assess agribusiness programmes and performance in different contexts (Adeyanju, Mburu, & Mignouna, 2021; Bello *et al*., 2021; Lachaud *et al*., 2018; Ramushu, 2021). However, most evaluations focus on the impact of hard skills, while studies considering programmes that combine hard and soft skills are limited. Also, little progress has been made in empirically assessing impacts at cross-country or regional levels. Without sufficient practical evidence, policymakers and development partners involved in programme implementation may be caught between making informed decisions about scaling programmes or truncating them altogether.

This study, therefore, fills this gap by empirically assessing the impact of agribusiness empowerment programmes on the livelihoods of young African agripreneurs taking evidence from the ENABLE-TAAT[15] programme in Kenya, Nigeria, and Uganda. The main contributions are as follows. First, the study deviates from existing studies by assessing a youth agribusiness programme that combines technical training and entrepreneurship training, with mentorship, internship, and experimental learning via agribusiness incubations. Second, a quasi-experimental approach was followed to evaluate the impacts of participation on two livelihood outcomes. Third, the study attempts to distinguish between the impact on agribusiness income and food security. This study contributes to an emerging body of empirical literature on youth agripreneurship in Africa and helps to generate evidence that could inform national and regional policy decisions as well as assist development partners in recipient

[15] ENABLE-TAAT is the youth compact of the Technologies of African Agricultural Transformation (TAAT) which aims at promoting economic power among youth in Africa by exposing them to agribusiness value chains and various profitability mechanisms.

countries in formulating and implementing similar interventions to strengthen programmes and improve their outcomes.

The rest of the paper is structured as follows: The next section presents a review of empirical studies relevant to the research objective. Section 8.3 describes the data, variable operationalization, and estimation strategy. The results and discussions are presented in section 8.4. Finally, the paper concludes with the highlights, relevant policy implications, and recommendations for further studies in section 8.5.

8.2 The ENABLE-TAAT programme

The ENABLE-TAAT programme was initiated to involve youth, aged 18-35 years, in the process of agricultural transformation and help tackle the issue of youth unemployment in Africa. It is one of 15 Compacts covering the Technologies for African Agricultural Transformation (TAAT) Programme, which was funded by the African Development Bank (AfDB) and led by the International Institute of Tropical Agriculture (IITA) through its youth in agribusiness initiative (IITA, 2020).

The project has four main objectives, which include improving the capacities of youths and transforming their attitude toward accepting agriculture as a business; To achieve this, young people, aged 18-35 years, were trained along different agricultural value chains and supported to develop sustainable agribusinesses. Also, beneficiaries received mentorship from experts in their chosen agro-enterprise. The second objective was to provide support to youth-owned agribusinesses through advocacy and ICT. This was achieved by identifying within nine significant commodity value chains (including maize, sorghum, and small livestock, among

others) agribusiness opportunities that exist and help scale up these opportunities for youths to adopt.

Also, it included showcasing participants and their businesses through major communication platforms including social media. It also aimed to increase the number of young people engaged in various agribusinesses and improve food and nutrition in rural areas by raising awareness and access to improved food and nutrition in rural areas through the promotion of nutrient-fortified commodities. This was achieved by creating a network of nutritional food basket demonstrations which was promoted via outreach initiatives that inform the beneficiaries about better varieties. Emphasis was on improving the performance of youth-owned agribusinesses to improve youths' livelihoods.

The 3-year programme was conducted across 19 African countries: DR Congo, Kenya, Nigeria, Tanzania, Uganda, and Zambia between 2018-2021. The programme provided intensive training, and mentorship, and facilitated the establishment and expansion of agribusiness ventures to 4398 youths (IITA, 2020). With regards to the study locations, a total of 1384 youths, 344, 440, and 600 beneficiaries from Kenya, Nigeria, and Uganda, respectively participated in the programme in 2018. The following are the key training and support that the beneficiaries received.

1. Agribusiness entrepreneurship training: The participants received training on six core topics: (a) introduction to entrepreneurship, (b) qualities of a good entrepreneur, (c) identifying agribusiness opportunities, (d) how to develop a good agribusiness plan, (e) presenting and pitching business ideas

2. Business management training: Here, participants received training on (a) establishing and running an agribusiness, (b) systematic agribusiness planning, (c) cost and cost categorization, (d) Financial record keeping, (e) profit and loss analysis, (f) market analysis
3. Technical hands-on: Participants received technical training on crop and animal production and processing. Also, they were exposed to different value-addition activities that could improve their performance.
4. On-the-job training/Internship/Mentorship: After the main training activities, participants joined the agribusiness incubation programme where they had the opportunity to intern and gain real-world experience. Agripreneurs also received mentorship and support from experts in their respective businesses.

8.3 Materials and Methods

8.3.1 Empirical Framework

Assessing programme impact in the absence of a Randomized Control Trial (RCT) can be quite challenging due to issues of sample selection and endogeneity biases. While previous quasi-experimental studies have applied the Propensity Score Matching (PSM) method to address these issues (Amare & Simane, 2018; Griffin *et al*., 2020; Sedebo *et al*., 2022; Wordofa *et al*., 2021), this method has been criticized for its limitations in assessing unobservable characteristics, thereby posing a selectivity bias (Adeyanju *et al*., 2021).

To address these issues, the Endogenous Treatment Effect Regression (ETER) model was used to identify factors that influenced participation decisions and assess the impact of the programme on youth livelihoods (Adeyanju *et al*., 2021; Balde *et al*., 2019; Mensah *et al*., 2021; Ogunniyi *et al*., 2018; Zhong *et al*., 2021). The model is unique for its ability to address

endogeneity issues resulting from observed and unobserved factors and equally provide the Average Treatment Effect (ATE) of the endogenous dummy variable on the dependent variable. The ATE estimate is the same as the Average Treatment Effect on the Treated (ATT) when the treatment variable is not interacted with any of the explanatory variables in the outcome model (Nyaaba *et al*., 2019).

The ETER model is a two-stage estimation method that combines a binary selection equation that models participation decisions in the first stage with a linear regression model that models a continuous outcome in the second stage. In this study, participation decision was modelled as a dichotomous variable, which takes the value of 1 for participants and 0 otherwise. The modelling approach follows that an agripreneur will choose to participate in the ENABLE-TAAT programme if they perceive the programme as beneficial and the expected utility from participation exceeds that of non-participation, considering the amount of time spent on the programme.

However, since both groups were not randomly assigned to treatment (participation), they are more likely to be different based on certain unobservable which could lead to sample selection bias. Also, participation decisions are likely to be affected by these unobserved factors. These limitations motivated the use of the ETER model, which addresses both sample selection and endogeneity biases.

Consider a rational young agripreneur, i, confronted with two decisions of either to participate in the ENABLE-TAAT programme or not, based on the expected utility from participation. The participation decision can then be expressed as in Equation 8.1:

$$T_i^* = \alpha X_i + \varepsilon_i, \; where \; T_i = \begin{cases} 1 \; if \; T_i^* > 0 \\ 0 \; otherwise \end{cases} \tag{8.1}$$

Where T_i^* is the latent variable that specifies whether a young agripreneur participated in the programme or not. Hence, T_i is a dichotomous variable that equals 1 for programme participants and 0 for non-participants. α represents the vector parameter to be estimated, X_i denotes the covariates that determine participation decisions, and ε_i is the disturbance term.

To identify the selection equation, it is essential to include at least a variable, otherwise known as an exclusive restriction, which affects participation but does not directly influence the outcome variables except through the selection variable. The exclusive restrictions included in the equation are discussed under the model identification strategy.

After accounting for endogeneity, the second stage or outcome equation can be expressed as:

$$Y_i = \mu W_i + \eta T_i + u_i \quad (8.2)$$

Where Y_i is the outcome variables (agribusiness income and food security), W_i represents the covariates that influence income and food security; T_i as previously defined as an indicator of participation status; η and μ are vectors of parameters to be estimated; and u_i is the disturbance term.

The conditional expectation of the outcome variables and expected value of the two error terms can be computed using Equations (8.3) and (8.4):

$$E(Y_i/T_i = 1) = \mu W_i + E(u_i/X_i\ , \varepsilon_i) = \mu W_i + E(u_i/\varepsilon_i), \text{ with } E(u_i/\varepsilon_i) \text{ != } 0 \quad (8.3)$$

$$E(u_i/\varepsilon_i\ ) = E(u_i/\varepsilon_i \leq \alpha X_i\ ) = E(\ \sigma_u, \rho/\varepsilon_i) = \rho\sigma u\varphi(\alpha X_i\ )/\Phi(\alpha X_i) \quad (8.4)$$

Where $\varphi(.)$ and $\Phi(.)$ represent the standard normal density and cumulative distribution functions, respectively. The ETER model was estimated using the Full Information Maximum Likelihood (FIML) method.

8.3.2 Data, Sampling, and Variable Definition

The data used in this study were obtained under the ENABLE-TAAT programme funded by the African Development Bank (AfDB) and facilitated by the International Institute of Tropical Agriculture (IITA). The data were collected through a questionnaire survey of young agripreneurs in Kenya, Nigeria, and Uganda, three of the pilot countries where the ENABLE-TAAT programme was conducted in 2018, between September and December 2021. These countries were purposively selected based on three criteria. First, they were three of the pioneering countries in which the ENABLE-TAAT programme was conducted in 2018. The second criterion was related to the severity of unemployment and underemployment, while the third criterion was based on the relatively high number of programme participants compared to the other countries.

A multistage sampling technique was adopted in selecting the respondents. Following the purposive selection of the three countries as earlier discussed, the study population was stratified into programme participants and non-participants in the second stage. Participants were those who participated in the ENABLE-TAAT programme in 2018, and non-participants were other agripreneurs in the community who did not participate in the programme. The list of participants and non-participants was obtained from the repository of the ENABLE-TAAT programme in each country's coordinating offices. This was sorted and closely monitored by the programme coordinators in both countries. These lists also served as the sampling frames for selecting the participants and non-participants.

Based on the sample size determination formula proposed by Yamane (1967), the third stage involves the random selection of 1463 respondents, comprising 747 participants and 716 non-participants, across the three countries using random numbers generated on Microsoft Excel.

Specifically, the total sample size of 1463 was proportionately shared between the three countries. A total of 407 youths (186 participants and 221 non-participants) were selected in Kenya, 440 youths (238 participants and 202 non-participants) from Nigeria, and 617 youths (324 participants and 293 non-participants) in Uganda. However, out of those selected, 400 respondents (183 participants and 217 non-participants) participated in Kenya, 429 respondents (230 participants and 199 non-participants) participated in Nigeria, and 606 respondents (324 participants and 282 non-participants), participated in Uganda, summing up to 1435 respondents in total. This gives a 98 percent response rate. The 2 percent excluded was due to the unavailability and refusal of some respondents to participate.

Before the main survey, the questionnaire was pre-tested for validity and completeness. The questionnaire was administered by trained enumerators who had at least 14 years of formal education, could speak English and local languages fluently, and had prior experience in conducting field surveys. The survey was closely monitored and supervised by the programme coordinators and lead investigators. The key variables included in the questionnaire are described in Table 8.1.

8.3.3 Outcome Measures

This study focused on two outcome measures that are aligned with the objectives of the programme – Agribusiness Income and Food security.

Agribusiness income was measured as the logs of total income from agribusiness-related activities, which is the summation of total earnings from crop production, sales of livestock, and processed agricultural products by each respondent.

Table 8. 1. Definition of Key Variables Included in the ETER Model and their Expected Signs

Variable	Measurement	Hypothesized sign (Participation)	Hypothesized sign (Income and FCS)
(ln)Income	Natural log of total annual income from agribusiness activities (in naira)		
(ln)FCS	Natural log of food consumption score		
Participation	Participation in the ENABLE-TAAT programme (Participant=1, non-participant=0)		+
Age	Age of respondents in years	+	+/-
Education	Years of formal education	-	+
Gender	Dummy (Male=1, Female =0)	+	+/-
Marital status	Dummy (Married=1, otherwise=0)	-	+
Household size	Number of household members (headcount)	+	+
Experience	Years of agribusiness experience	+/-	+
Land size	Hectares of land owned	+	+
Value of asset	The total value of agribusiness assets	+/-	+
Credit	Borrowed money in the last 12 months Dummy (Yes= 1, No=0)	+	+/-
Extension	Access to extension services Dummy (Yes= 1, No=0)	+	+
Residence	Current residence (Rural=1, Urban and others=0)	-	-
Partnership	Involved in business partnership (Yes=1, No)	+/-	+
Perception	General perceptions of agribusiness empowerment interventions/programmes (Positive=1, otherwise=0)	+	
Awareness	Awareness of the ENABLE-TAAT programme (Aware=1, unaware=0)	+	
Covid-19	Did the pandemic affect major agribusiness activities (Yes=1, No=0)		-

Source: Authors' compilation (2022)

As a measure of general nutrient intake, *food security* was measured using the Food Consumption Score (FCS). The FCS also referred to as a "food frequency indicator," is a frequency-weighted diet diversity score calculated using the consumption frequency of eight food groups, including main staples, pulses, vegetables, fruit, meat and fish, milk, sugar, and oil, over a 7-day recall period (Wiesmann *et al*., 2009). It indicates the dietary diversity, consumption frequency, and sources of these food items. In this study, the FCS was constructed using the information on food consumption gathered from country-specific food items.

The relevance of these food items to food security has been widely discussed in the literature. While some food items such as cereal grains are common staples that are easily accessible and affordable (Brouns *et al*., 2019; Fukagawa & Ziska, 2019; Poole *et al*., 2021), other items such as exotic fruits and dairy products are quite expensive and rarely found in African diet. For instance, Fukagawa and Ziska (2019) document that over 20 percent of the world's calories come from rice while cereal grains provide the world's population with the most accessible and affordable macronutrients (energy and protein). However, sustainable food security cannot be actualized by depending on just a few crops (Aworh, 2023).

In this study, respondents were asked how many days they had consumed different food items in the week before the survey. These food items were grouped into eight specific food categories, as presented in Table 8.2. The consumption frequencies of the eight groups were summed, and any frequency above seven was capped at seven. Next, the frequency obtained for each food group was multiplied by an assigned weight (see Table 8.2) that is based on its nutrient content. Finally, the FCS was computed as the sum of the weighted values of all the food groups.

Table 8. 2. Food Groups and Weight Used in Constructing the FCS

Food Items	Food Groups	Weight
Maize, rice, pasta, bread, and other cereals	Cereals and Tubers	2
Cassava, Yam, Arrow roots/Cocoyam, and potatoes		
Vegetables and leaves	Vegetables	1
Fruits	Fruit	1
Beef, goat meat, poultry, pork, eggs, fish, other meat, and seafood	Animal protein	4
Beans, peas, lentils, peanuts, and others	Pulses	3
Milk and other milk products	Milk	4
Sugar, honey, and sugar products	Sugar	0.5
Edible oils, fats, and butter	Oil	0.5

Source: United Nations World Food Programme (2008)

This method of assessing food consumption has been adopted to compute individual and household food consumption by many studies in developing countries (Aweke *et al*., 2021; de Menezes-Júnior *et al*., 2022; Fite *et al*., 2022). The formula used in computing the food consumption score is presented in Equation 8.5:

$$\text{FCS} = \Sigma F_i X_i \tag{8.5}$$

where F_i represents the different food groups, and i is the different food items. X_i denotes the consumption frequency of each food group over the seven days preceding the survey. Finally, the continuous FCS was categorized into appropriate thresholds of food consumption groups as follows: poor food consumption (FCS = 0 – 28), borderline (FCS = 28.5 – 42), and acceptable food consumption (FCS >42) following United Nations World Food Programme (2008).

8.3.4 Identification Strategy

As exclusive restrictions, two instrumental variables, perception of agribusiness empowerment programmes and awareness of the ENABLE-TAAT programme, were identified as factors that may likely influence participation decisions but may not directly influence income and food security, except through participation.

The *perception variable,* as identified by other literature, is a strong determinant of programme participation (Adeyanju, Mburu, & Mignouna, 2021; May *et al*., 2019; Mishra *et al*., 2018). Several studies have found a positive link between perception and participation in agricultural programmes/interventions. For instance, Adeyanju *et al*., 2021 emphasized the need to improve youth perception of agricultural-related programmes to increase participation and ensure that many young people remain in agribusiness. The authors also stressed the need for programme restructuring to entice the younger generation since increased participation has stern implications for food security and youth employment. This study, therefore, hypothesized that positive perceptions of agribusiness empowerment programmes could lead to increased participation and vice versa. However, while programme perception may directly influence an individual's participation decision, it does not have a direct link to the outcome variables, except through participation. Perception was measured as a binary variable that equals 1 if a respondent holds a positive perception (i.e., perceiving empowerment programmes as generally beneficial) and 0 otherwise.

Prior *awareness of the ENABLE-TAAT programme* before its implementation is expected to influence youth participation decisions directly, but not their livelihood outcomes. This is because those who have prior information about the programme, such as the objectives of the

programme, its location, and so on, may find it more worthy to attend than those who are unaware. However, programme awareness is not directly linked to income and food security, except through participation. Awareness was measured as a binary variable that equals 1 for those who had information about the programme before its implementation in 2018 and 0 otherwise.

8.4 Results and Discussions

8.4.1 Food Consumption Score

Table 8.3 presents the average food consumption scores (FCS) and the percentage of respondents that had acceptable food consumption scores by country and participation status.

Table 8. 3. Food Consumption of Youths in Kenya, Nigeria, and Uganda

Food Consumption profile	Pooled		Kenya		Nigeria		Uganda	
	P	NP	P	NP	P	NP	P	NP
Average food consumption score	46.37	43.87	54.44	48.69	48.76	46.34	40.11	38.41
Acceptable Food Consumption (%)	50.75	45.13	67.21	55.75	54.78	45.73	58.53	36.52

Notes: P =participants; NP = non-participants

The results show that more participants (51 percent) than non-participants had acceptable food consumption scores across the three countries, suggesting that participants are more food secure than their counterparts who did not participate in the programme. While this could suggest a positive impact of the programme, further enquiry and an in-depth assessment are required to validate these results. The country disaggregation shows that over two-thirds of the participants in Kenya had acceptable FCS while more than half had acceptable scores in

Nigeria and Uganda (55 percent and 59 percent, respectively). Also, participants had higher FCS than non-participants.

The pooled average FCS for participants was about 46 points compared to 43 points for non-participants. By country, Kenyan participants had the highest score of about 54 points, followed by Nigeria and Uganda with 49 and 40 points, respectively. This implies that overall, food consumption was highest among the participants in Kenya, followed by Nigeria and Uganda. Even though the results indicate that, with an exemption of Uganda, non-participants had acceptable scores based on the threshold defined by the United Nations World Food Programme (2008), the higher scores recorded for participants could suggest the positive impact of programme participation on food consumption. This high FCS obtained by respondents could be attributed to their engagement in agripreneurship since they have an increased capacity to produce what they consume (Jaleta *et al*., 2018; Sibhatu & Qaim, 2018).

This further supports the claims of several studies that recommend agripreneurship as a means of improving youth livelihoods in Africa (Adeyanju, Mburu, & Mignouna, 2020, 2021; Adeyanju, Mburu, Mignouna *et al*., 2021; Addo, 2018; Ray, Panigrahi, & Shasani, 2022). The food consumption disparity between the two East African countries is surprising but, could be attributed to differences in food choices (for instance, high milk and dairy product consumption in Kenya) and Kenya being the hub of East Africa's economic activities. Generally, despite being food producers, the non-participants in Uganda had an average which falls within the non-acceptable food consumption group.

8.4.2 ETER Model Results- Impact Estimates (Income and Food security)

Table 8.4 presents the impact estimates obtained for income and food security using the ETER model. The two instrumental variables included to identify the models were statistically significant at p<0.01 (Table 8.4), indicating that the condition for the exclusive restriction was met. The significance of rho, which is the correlation coefficient between the error terms of the selection (participation) and outcome (agribusiness income and food security) equations, indicates sample selection bias and endogeneity. This implies that unobserved characteristics influenced participation decisions. Also, the significance (Prob > chi2 = 0.01 for both income and FCS) of the likelihood ratio tests for joint independence confirms a correlation between the selection and outcome equations. This further justifies the use of the ETER model for the analysis.

Table 8. 4. Impact of the ENABLE-TAAT Programme on Youths' Income and Food Security in Kenya, Nigeria, and Uganda

Treatment effect	Income				Food security (FCS)			
	Pooled	Kenya	Nigeria	Uganda	Pooled	Kenya	Nigeria	Uganda
ATT	0.330***	-0.236	0.544***	0.369***	0.753***	0.901***	-0.092	0.772***
	(0.076)	(0.145)	(0.152)	(0.064)	(0.081)	(0.087)	(0.266)	(0.126)
Instruments								
Perception	0.382***	0.500***	0.262	0.600***	0.261***	0.111	-0.023	0.442**
	(0.081)	(0.140)	(0.160)	(0.192)	(0.071)	(0.076)	(0.161)	(0.187)
Awareness	0.401***	0.377**	0.086	0.640***	0.404***	0.328***	-0.122	0.741***
	(0.778)	(0.171)	(0.137)	(0.171)	(0.069)	(0.105)	(0.156)	(0.157)
LR test of indep. eqns. (rho = 0):								
chi2(1)	6.12***	2.84*	1.58	5.31**	25.60***	14.28***	0.22	14.30***
Rho	-0.385***	0.500*	-0.584***	-0.438	-0.721***	-0.974***	0.266	-0.645***

Notes: Standard error in parenthesis; *** p <0.01, ** p < 0.05, * p < 0.1

The results show that programme participation led to an approximately 33 percent increase in agripreneurship income, indicating a positive and significant (at $p<0.01$) impact on youth income. The increased income could be a result of the better business practices learned from the programme. Beneficiaries received practical training on how to run and manage their agribusinesses. Also, they were exposed to innovative methods of farming and received continuous mentorship from experts. These results agree with Lachaud *et al*. (2018), who found that an agri-business skills training programme improved the labour market outcomes of young Zimbabwean farmers four years after the programme was conducted largely because agribusiness empowerment programmes expose participants to a broad range of innovative support services aimed at enhancing both technical and managerial skills for sustainable and profitable production and marketing (Kilelu *et al*., 2022; Koutsouris & Zarokosta, 2020).

Disaggregated by country, a positive and significant impact was found in Nigeria and Uganda while no significant impact was found in Kenya. This implies that the result should be interpreted with caution as there may be potential heterogeneity, such as location in this case, which may affect the estimated ATT conditional on programme participation. Also, a positive, and significant result was obtained for food consumption (at $p<0.01$) for the pooled sample, where participation led to about a 75 percent increase in FCS for participants. This could be attributed to the food security component of the programme which includes sensitization on healthy diets and exposure to crop diversification strategies. This corroborates Garbero and Jäckering (2021), who found that agricultural programmes improve the food security status of beneficiaries, especially for those residing in food-insecure countries. According to Ouko *et al*. (2022), efforts to support youth agripreneurship will drive better livelihoods among youths, particularly in developing countries. The country analysis shows positive and significant

impacts in the two eastern African countries while no significant impact was found for Nigeria. This could be attributed to the different food groups consumed in these countries.

These results show the positive and significant impacts of agribusiness empowerment interventions on youth livelihoods. While the pathway through which this occurs was not assessed, these programmes could fill the experience gap faced by young people and equip them with the necessary skills for better agribusiness performance (Adeyanju *et al*., 2021). Better performance in turn could contribute to wealth creation and facilitate the acquisition of productive resources, which could result in increased productivity, higher income, and food security.

The results further address the concerns of Ouko *et al*. (2022) on the effectiveness of programmes in generating better livelihood outcomes for youth. As evident in this study, agribusiness empowerment programmes such as ENABLE-TAAT offer positive economic outcomes for young agripreneurs and more importantly, could guide them during the start-up stage of their agribusiness life cycle. This is particularly relevant, considering that respondents have barely 4 years of agribusiness experience. This corroborates other studies that have found a positive relationship between programme participation and labour market outcomes (Baiyegunhi *et al*., 2019; Ojo & Baiyegunhi, 2020).

8.4.3 Factors influencing Agripreneurship Income

Table 8.5 presents the factors influencing agripreneurship income. The results show a positive and significant correlation between experience and income, suggesting that more experienced agripreneurs earn higher incomes than less experienced ones. This is not surprising given the significance of experience to technical know-how and performance.

Table 8. 5. Factors influencing Youth Agripreneurship Income in Kenya, Nigeria, and Uganda

Variables	Income			
	Pooled	Kenya	Nigeria	Uganda
Age (years)	0.005	-0.005	-0.008	0.007***
Education (years)	0.013	0.072	0.814***	-0.031
Gender (Male=1)	0.037***	0.011	-0.008	0.036
Household size	-0.032	-0.068	0.030	-0.009
Experience (years)	0.062***	0.099***	0.191***	-0.047
Land size (Hectare)	0.009***	-0.007	0.057***	0.019***
(ln)Asset value	0.024***	0.050***	0.006	0.029***
Credit (Yes=1)	0.039***	0.122***	0.100*	0.227***
Extension	0.047***	0.003***	0.000	0.000
Residence (Rural=1)	0.111***	0.155***	0.001	0.054
Covid19 (=1)	-0.010	0.006	0.001	0.008
Partnership	-0.006	0.154***	-0.009	0.073***
Constant	7.750***	7.647***	5.507***	7.555***

Notes: *** p <0.01, ** p < 0.05, * p < 0.1

While experience was a significant determinant of income in Kenya and Nigeria, it was not significant in Uganda. The heterogeneous effect of income based on the value of agribusiness assets could be as a result of more productive resources, which could aid productivity and income. This corroborates Quisumbing *et al*. (2015), who reported a positive linkage between tangible/intangible assets and livelihood strategies contributing to income generation and food security. Thus, asset-rich individuals are more likely to generate higher income than their counterparts. This is also supported by Tabe *et al*. (2022), who found that asset-rich households usually have sufficient resources to invest in economic activities that can potentially yield higher income. While asset was a strong determinant of income in the East African countries,

it was not significant for Nigeria. A positive correlation between credit and income is expected since credit facilitates business expansion which could increase production and economic returns. This was significant across the three countries, suggesting that credit is a strong determinant of income.

Also, access to extension services was correlated with higher agribusiness income. This could be because extension contact facilitates access to information on emerging innovations and modern production practices that could help enhance productivity and agribusiness income. Also, extension contact encourages the adoption of innovations that could positively impact production. This corroborates Bowe and van der Horst (2015), who found that the best practice agronomic advice given by corporate farm extension to smallholder farmers in Rajasthan led to yield improvement, which significantly increased farm income. This result also agrees with Danso-Abbeam *et al*. (2018), who reported a positive relationship between access to extension and the income of maize farmers in the Tolon District of northern Ghana. Access to extension was only significant for Kenya when disaggregated by country. Another factor correlated with increased income and peculiar to the two East African countries is partnership, suggesting that those in agripreneurship partnerships earn higher income than their counterparts. This could be because partnership facilitates resources aggregation which could lead to business expansion.

8.4.4 Factors Influencing Food Security

Table 8.6 presents other factors influencing food security among the participants. Market access had a positive and significant correlation with food security across the three countries. This could be because having market access, particularly the input market, may aid the adoption of improved inputs and better services that could contribute to increased production.

Table 8. 6. Factors Influencing Youth Food Consumption in Kenya, Nigeria, and Uganda

Variables	FCS			
	Pooled	Kenya	Nigeria	Uganda
Age (years)	0.180**	0.032	0.067	-0.026
Education (years)	0.125	0.136	0.059	0.066
Gender (Male=1)	0.047	0.035	0.042	0.038
Household size (#)	0.020	-0.005	-0.028	0.030
Experience (years)	-0.043	-0.054	0.005	0.009
Business level	-0.023	0.012	-0.041	-0.015
Credit (Yes=1)	0.161***	0.108***	0.095**	0.051
Access to market	0.146***	0.148***	0.154***	0.108**
Asset	0.175***	0.105	0.075	0.173**
Residence (Rural=1)	0.015	-0.019	0.012	0.110
Access to land (Yes=1)	-0.017	0.034	-0.003	0.202**
Covid19 (=1)	-0.093***	-0.072**	-0.042	-0.126**
_cons	2.572***	3.280***	3.297***	3.006***

Note: *** p <0.01, ** p < 0.05, * p < 0.1

Also, it could facilitate access to diversified food items which could influence food consumption. This corroborates Ogunniyi *et al*. (2021) who attributed improved food security to the positive effect of market information. This, however, contradicts Usman and Callo-Concha (2021) who found that market access encouraged smallholder households to rely less on their own production to improve household consumption diversity.

Having access to credit was positively and significantly correlated with food security for the pooled analysis, suggesting that having access to credit could improve food security. This could be because access to credit could facilitate business expansion, raise agricultural output, and increase income. Increased production and income could contribute to both individual and

household food security. According to Bidisha *et al*. (2017), credit facilitates greater caloric intake through larger meal portions. Also, it improves meal quality and consumption diversity patterns. This corroborates other studies that have highlighted credit as a crucial factor that promotes household food security (Aidoo *et al*., 2013; Iftikhar & Mahmood, 2017).

As expected, food security was negatively influenced by the Covid-19 pandemic. According to the results, the pandemic reduced food consumption by 9 percent, 7 percent, and 13 percent, respectively for the pooled, Kenyan, and Ugandan groups. This is in line with several studies that have discussed the negative effects of the pandemic on farming households. The significance of this variable suggests that the East African respondents could be attributed to the COVID-19 restrictions and lockdown measures implemented to curb the pandemic.

CHAPTER NINE

GENERAL CONCLUSIONS AND RECOMMENDATIONS

9.1 Conclusions

The importance of agripreneurship as a link between youth, agriculture, and rural employment cannot be overstated. The declining job opportunities in the formal sector necessitate the development of a vibrant agribusiness sector that supports young people. Despite agriculture being typically portrayed as a profession for unskilled labourers, the precarious nature of graduate unemployment in many African countries is pushing more educated youths to look for employment in rural areas as is the case in the three countries assessed in this study. While young people are yielding to the call and engaging in agripreneurship, it is essential to implement programmes to help them sustain their businesses and, invariably, improve their livelihoods. Also, based on their limited agribusiness experience, it is evident that young agripreneurs could benefit more from such programmes.

This study assessed the impact of agribusiness empowerment interventions on skills development and livelihood outcomes of young people taking evidence from the ENABLE-TAAT programme in Africa. The programme combines elements of entrepreneurship training, technical training, and mentorship to improve youths' food security status, promote their agribusiness performance, and harness their job creation capacity. Five key hypotheses based on the study's objectives were tested. As a key component of the programme assessed, the starting point was the assessment of the level and determinant of food security among the respondents, with the hypothesis that young agripreneurs are food insecure. The second hypothesis is that socioeconomic, demographic, and institutional factors have no significant

influence on participation in the ENABLE-TAAT programme. Also, it was hypothesized that programme participation had no significant impact on youth agripreneurship skills, job creation capacity, and livelihoods. While acknowledging cross-country variations and the study's focus on only three countries in which the programme was implemented in 2018, the results are generally positive.

The first paper which assessed food security and its determinants among young agripreneurs suggests low dietary diversity among the respondents across the three study countries. Food security, proxied by FCS revealed that close to half of the respondents are within the acceptable food consumption group, suggesting that they are food secure. The odds of being food secure was positively correlated with access to extension services, participation in the ENABLE-TAAT programme, and access to market information but, negatively correlated with access to credit, number of employees, the COVID-19 pandemic, and the location variables. In addition to these variables, the gender-disaggregated analysis showed that the food security status of female agripreneurs was positively correlated with age, suggesting that younger females are more likely to be food insecure. These findings highlight the relevance of agribusiness empowerment programmes (ENABLE-TAAT) in boosting the food security status of young agripreneurs/farmers in Africa.

Findings from the second paper which assessed the determinants of youth participation in the ENABLE-TAAT programme showed that most university graduates are either pulled into agribusiness based on the several business opportunities embedded in the sector and access to productive resources on the one hand or pushed into agribusiness due to the inability to secure formal employment on the other hand. This suggests that many young graduates see

agricultural employment as a strategy to cope with future economic and livelihood hardship. While engagement may not be passion-driven for some, having more educated youths in agribusiness could have a positive outlook for the agricultural sector in the long run, particularly since future food production largely rests on young people.

The results also showed that participation in the ENABLE-TAAT programme was correlated with years of formal education, asset value, agribusiness experience, business level, credit, and perception, suggesting that participation is determined by both socio-economic and institutional characteristics. The direction and significance of perception across the three countries led to the conclusion that perception is a strong determinant of participation in empowerment programmes largely because perception drives actions. The trend observed in the effect of experience and business level suggests that programme structure and targeting may discourage more experienced youths from participating in agribusiness programmes, likely due to the ego of being more knowledgeable or running well-established agribusinesses.

The third objective which assessed the impact of programme participation on agripreneurship skills revealed that participants had higher agripreneurship skills scores than non-participants. Furthermore, the positive and significance of the impact estimates across the three countries led to the rejection of the null hypothesis that the programme had no significant impact on youth agripreneurship skills. Thus, the study concludes that participation in agribusiness empowerment programmes positively impacts youth agripreneurship skills most likely because the programme was designed to harness the agripreneurship mindset of the beneficiaries and help them gain the relevant technical and entrepreneurship skills to run and manage successful

agribusinesses. While this is a more direct impact, better agripreneurship skills are fundamental to business performance and may translate into better livelihoods and economic status.

Objective four assessed the impact of programme participation on job creation capacity. The results show that young people contribute to job creation, and more specifically they create jobs for their peers. Generally, job creation was higher among programme participants who hired more of their peers (people between 18-35 years) across the three countries. This supports the argument that young people will likely be at the forefront of job creation in the coming years and suggests a trend of peer-to-peer employment which is fundamental to reducing youth unemployment in Africa. The factors that determined the number of jobs created include age, marital status, agripreneurship experience, business level, access to productive resources, and income.

The results also show that overall, programme participation significantly increased the job creation capacity of agripreneurs across the three countries. These results suggest the relevance of agribusiness programmes in harnessing peer-to-peer job creation among young people which could have significant implications for the agricultural sector and the African economy at large. Firstly, peer-to-peer employment could proffer solutions to the rising rates of youth unemployment and help to address the issue of the ageing farming population in the continent. Also, engaging more youths in agricultural activities could contribute to increased food production since they are more agile and innovative, thereby contributing to SDG 2 on zero hunger.

A further inquiry into the heterogenous effect of the programme revealed that participation could potentially improve the job creation capacity of non-participants if they participate in the

programme. Based on these results, the null hypothesis that the programme had no impact on young agripreneurs' job creation capacity was rejected and it was concluded that the programme was relevant in harnessing the job creation capacity of the youths. While the channel through which this occurs was not assessed, the programme could have facilitated business expansion thereby driving youths to hire more labour for their agribusiness activities.

The fifth objective assessed the impact of the programme on agribusiness income and food security. The higher food consumption score and income obtained by participants as well as the significance of the impact estimates led to the rejection of the null hypothesis and the conclusion that the programme significantly impacts youths' livelihoods. This aligns with the results obtained in the first objective which shows programme participation as a positive and significant determinant of food security. However, accounting for location (Country) heterogeneity revealed that impacts differ across the three countries. While no significant impact was found on income in Kenya, the Nigeria result also showed no significant impact on food security. This led to the conclusion that country-specificity and contextual factors which could affect outcomes should be considered during programme design and implementation. Among other factors, access to credit, extension services, and productive resources were correlated with youths' livelihood.

As a strategy to continue to promote youth agripreneurship, the findings suggest the relevance of rigorous empowerment/training programmes such as the case study in helping young agripreneurs develop the necessary technical and managerial capabilities required for better business development and management. This is particularly important, considering that many young agripreneurs are low-skilled and inexperienced. The results also show that youth have

more to gain from these programmes. While the study did not assess their direct relationship, it is believed that better skills could translate into higher productivity, increased income, and higher food consumption, thereby helping to eradicate poverty among young people and helping them to become job creators instead of job seekers.

To the best of knowledge, this is the first study to assess the impact of a regional programme-ENABLE-TAAT- on skills development as well as on livelihood and economic outcomes in Kenya, Nigeria, and Uganda. Despite its significance, the results and policy implications should be interpreted within the following caveats. First, an issue of endogeneity remains in the estimation of the determinants of food security and participation in the ENABLE-TAAT programme. Also, due to resource constraints, the study only considered three out of the seven countries in which the programme was piloted in 2018. With the expansion of the programme to 19 African countries, it is important to expand impact studies to other countries in which the programme is being implemented. Regardless, the study fills an important knowledge gap by presenting the comparativeness of what works in different countries in which the programme was implemented.

9.2 Policy Recommendations

This study challenges several key elements of public and policy discourse about young graduates in Africa. Specifically, there is a general notion that young graduates are not interested in agriculture or the rural economy. What has remained unexplored is whether promoting a shift from conventional agriculture to agribusiness could motivate more youths to embrace the career path. The fact that young graduates seek to build livelihoods in agribusiness questions the assumption that formal employment is their default employment choice.

Also, how the respondents expressed their desires to remain in agribusiness without seeking formal employment could have stern implications for the rural economy in the coming years. For instance, more educated youth, with their skills and sophisticated education, could potentially improve agricultural production methods, attract more youths, bring innovations into the sector, and accelerate rural and agricultural transformation. Given this, strategies to mobilize young people, with their innovativeness and adventurous attributes, into agriculture should be on the policy priority list of developing countries. Also, in supporting young graduates engaged in agribusiness, it is imperative to provide both technical and financial support in different capacities.

Policy and programmes should be designed to address some of the challenges youth face in the labour market including those identified in this study. First, low access to credit facilities and the effect on livelihood across the three countries calls for strategies to improve the creditworthiness of young agripreneurs and link them with financial institutions that offer low/no interest rates. An example is group borrowing which was effective among young business owners in the United States. Given the initial investments needed for agribusiness, young graduates, particularly those who have stayed unemployed for a long period, could be financially vulnerable and may lack enough capital to kick-start/run a profitable and sustainable agribusiness venture. Improving the creditworthiness of youth and designing appropriate and inclusive credit facilities and services can equip youth with the resources required for productivity at this stage and keep them in agribusiness.

Second, youth are keen to belong to a community that supports their development and where they can share ideas and learn from others. Young graduates lacking technical know-how and experience in agribusiness may find it hard to seek advice from conventional farmers but may

be more comfortable interacting and exchanging ideas with their peers. In addition to creating a platform for expert mentorship, it is imperative to encourage peer-to-peer learning and support young mentors to assist their peers, leveraging relevant social media platforms and other digital innovations to market their products.

Also, successful agribusiness owners and groups should be recognized, documented and given platforms to offer mentorship. Just like how the youth look up to mentors in other career paths, having a successful agribusiness owner mentoring youths through apprenticeship, could foster on-the-job learning and help those with little or no experience to avoid costly technical mistakes that could affect their productivity. In addition to mentorship, it is important to invest in agribusiness training programmes that can equip youth with the necessary business and entrepreneurship skills in agriculture.

Perception of agribusiness empowerment programmes as a significant determinant of participation suggests the need to strategically improve youth perception of agricultural-related programmes. In essence, it is imperative to implement strategies that could change young people's negative perception of agricultural intervention for increased participation. Mobilizing young agripreneurs to participate in such programmes necessitates convincing them of the programmes' potential to provide valuable incentives and utility for participation. As a result, there is a need to disseminate the findings of studies such as the current one and success stories from existing programmes in both local and regional workshops to young stakeholders and youth groups. This is especially important because, as the impact estimates indicate, participation contributes to improved skills, and better skills will invariably help these countries and other African countries' agricultural development agendas.

Particularly, the concept of agripreneurship which is different from conventional agriculture should be promoted among youths. This could invariably change youths' perception of agriculture and motivate more youth to participate in agribusiness empowerment programmes. Considering the negative effect of experience on participation, it is essential to develop strategies that target agripreneurs operating at growth and maturity levels to ensure that their training needs are also being met. This is essential for them not to miss out on the emerging innovations and practises in agripreneurship. One strategy that could be adopted is peer-to-peer mentorship, as previously discussed. Considering that determinants vary across countries, programme targeting strategies and structures should be improved to speak to the socio-economic context, needs, and goals of different categories of youth across Africa.

Based on the positive and significant impact of the programme on skills development, job creation, income, and food security, it is evident that agribusiness empowerment programmes could help fill the experience gap faced by many young agripreneurs. As a strategy to continue to promote youth agripreneurship, modalities should be drawn by the government and development partners to increase investment in rigorous empowerment/training programmes that are youth-focused and scale existing programmes beyond the regular one-time period to help young people develop relevant technical competencies required for better business performance, especially during this period of multi-dimensional economic crisis. This is particularly important, considering that many young agripreneurs are low-skilled and inexperienced.

These efforts can be facilitated through regional policies such as the Malabo Declaration and Agenda 2063 which could be highly relevant for Kenya and Uganda. Also, hands-on training, such as the case study, should strategically target young agripreneurs against the regular one-

cap-fit-all agricultural programmes. Government and development partners could be more deliberate in designing programmes that meet the training needs of young actors. To scale the impact of such programmes, participants could be encouraged to peer with other non-participants for knowledge and skill transfer. Also, the programme could be established as a permanent incubation center against the current 3-year plan.

Considering their relevance to job creation capacity, food security, and income, efforts should include facilitating increased access to productive resources and assets to ease the various socio-economic hardships faced by young agripreneurs, particularly at the inception of their agripreneurship careers. Governments could establish developmental funds/grants targeting young agripreneurs. To facilitate access to land, there is a need to address challenges associated with access, ranging from customary laws in Uganda and Kenya to high costs in Nigeria. For instance, governments could give prospective agripreneurs free access to community lands based on pre-specified conditions.

To improve access to extension services, it may be beneficial to promote peer-to-peer extension services considering the few public extension agents across Africa and the effect of peer encouragement on agribusiness engagement found in this study. Similarly, the significance of access to training in improving agripreneurship skills suggests the need to facilitate youths' access to training opportunities via platforms that appeal to them. For example, the use of social media and local youth groups to circulate information about empowerment programmes should be encouraged. The positive influence of partnership on income in the two East African countries suggests that young agripreneurs could form productive business alliances and

engage in collective action to maximize their limited resources to scale and improve business performance.

9.3 Recommendations for further studies

Considering the relevance of this topic to policy discourse, further studies should be conducted to broaden the scope of the subject with more focus on countries that were not captured in the current study. Also, it would be beneficial to assess the impact from a gender perspective. This is because there are notable differences between male and female agripreneurs regarding access to programmes and productive resources. Since agripreneurship is a male-dominated sector, female agripreneurs may face tougher work challenges than their male counterparts. Also, studies that look at the different components of the programmes and the different sub-sectors in which the youths are engaged are highly encouraged.

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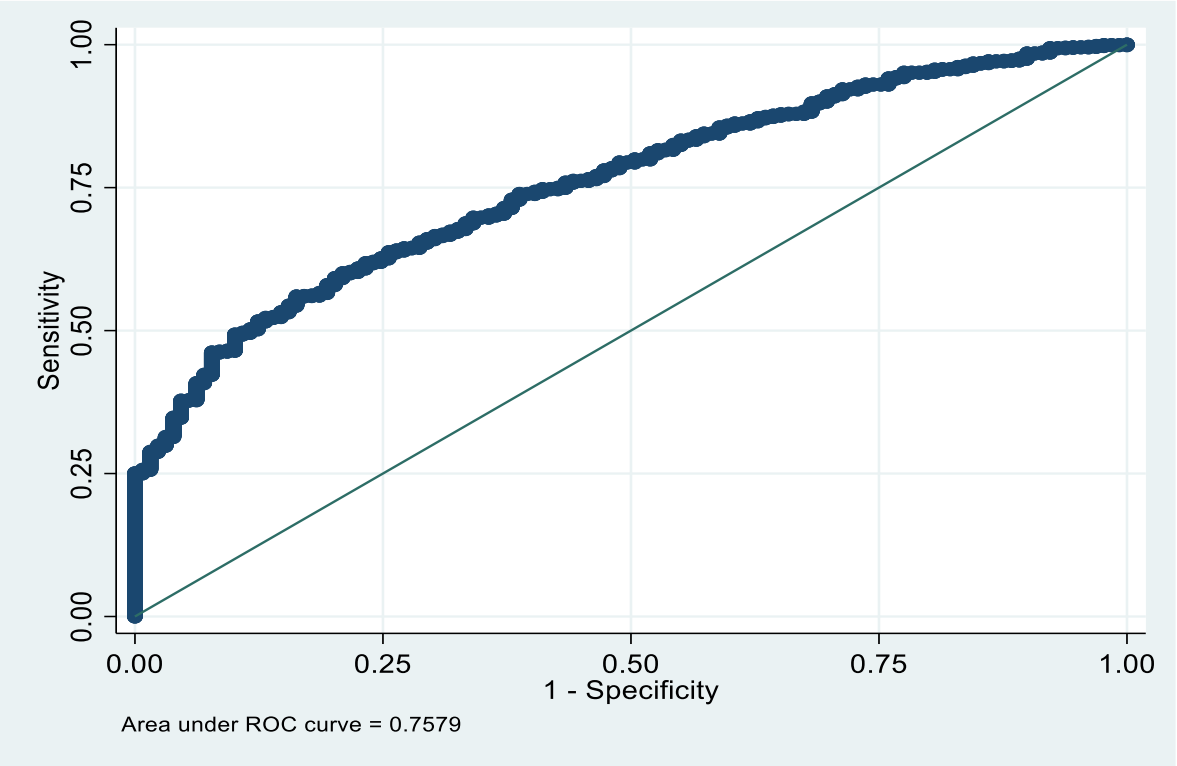
APPENDICES

Appendix 4A. Definition of Variables included in the Logit Model for Food Security

Variables	Measurement	Hypothesized direction	Reference
Extension Service	Dichotomous, taking the value 1 if a respondent has access to extension service and 0 otherwise	+	(Pan *et al*., 2018; Tesfaye *et al*., 2008; Yusuf *et al*., 2015)
Gender	Respondent's gender; 1 = male, 0 = female (Dummy)	+/-	Acheampong *et al*. (2022)
Credit	Measures whether an individual has access to credit or not; 1 = yes, 0 = no (Dummy)	+	(Aidoo *et al*., 2013; Iftikhar & Mahmood, 2017; Matchaya & Chilonda, 2012),
Age	Age of respondents in years (Continuous)	+/-	Acheampong *et al*. (2022); Masa, R., Khan, Z., & Chowa, G. (2020); Oyetunde-Usman, Z., & Olagunju, K. O. (2019)
Education	Years of formal education of respondent (Continuous)	+	Acheampong *et al*. (2022); Matavel *et al*. (2022)
Household size	Number of household members (Continuous)	-	Masa, R., Khan, Z., & Chowa, G. (2020); Matavel *et al*. (2022)
Residence	Current residence of respondent; 1=rural, 2=metropolitan, 3=Urban (Categorical)	-	Acheampong *et al*. (2022)
Ownership	Type of business ownership; 1=Sole owner, 0= Partnership (Dummy)	+/-	
ENABLE TAAT programme	Participation in the ENABLE TAAT programme; 1=participants, 0= Non-participants (Dummy)	+	Masa, R., Khan, Z., & Chowa, G. (2020)
Employees	Number of employees (Continuous)	+	Inegbedion, H. E. (2020)
Market Information	Access to market information; 1=Have access, 0=Otherwise (Dummy)	+	Ogunniyi *et al*. (2021); Tesfamariam *et al*. (2018)
Asset ownership	Whether a respondent has agribusiness asset or not; 1=Yes, 0=No	+	Sisha, T. A. (2020); Gebru *et al*. (2019)
Covid19	Whether agribusiness performance was affected by Covid19 or not; 1=Yes, 0=No	-	Workie, E., Mackolil, J., Nyika, J., & Ramadas, S. (2020)
Land size	Size of farmland owned in Hectares (Continuous)	+	Sisha, T. A. (2020)
Farm Income	Total farm income (Continuous)	+	Acheampong *et al*. (2022); Matavel *et al*. (2022)

Source: Authors' compilation

Appendix 4B. ROC Curve for the Logit Model for Food Security



Appendix 5A. Hypothesized Explanatory Variables for the Determinant of Programme Participation

Variable	Description	Measurement	Expected sign
PARTI	The dependent variable indicating youth participation	Dummy (Participation =1, Non-participation =0)	
AGE	Age of the youth	Age in years	+
EDUC	Years of formal education of the youth	Years of formal education	+/-
GEN	Gender of the youth	Dummy (Male=1, Female=0)	+/-
MAR	Marital Status of the Youth	Dummy (Married =1, Otherwise=0)	+
HHSIZE	Household size of where the youth comes from	Number of household members	+
ASSET	Value of durable asset owned	Continuous	+
EXP	Years of youth experience in agripreneurship	Continuous	+/-
BUS_LVL	Business level	Categorical (Start-up=1, Growth=2, Maturity=3)	+
CREDIT	Access to credit	Dummy (Yes=1, No=2)	+
OCC_HH	Occupation of Household head	Dummy, (Agriculture=1, Other sectors = 0)	+/-
PERC	Perception of agribusiness	Dummy (Positive=1, Negative=0)	+
Other variables			
PREF	Job preference	Categorical (Agribusiness =1, Formal job =2, Self-employment in other sectors = 3)	

Source: Authors' compilation

Appendix 6A: Youth Survey Questionnaire

THE IMPACTS OF AGRIBUSINESS EMPOWERMENT IN AFRICA: A CASE OF THE ENABLE-TAAT PROGRAMME

YOUTH SURVEY QUESTIONNAIRE, 2021

SECTION A: IDENTIFYING VARIABLES

Date of survey (dd/mm/yy) ___/____/2021 **Time Started** _____
Respondent ID _____

Supervisor (*Full Name*):_____
Enumerator (*Full Name*):_____
Country ID (**See Country codes**): _____
Country Codes: 1. Kenya( ) 2. Nigeria( ) 3. Uganda( )
State/District: _____ Village: _____

Respondent's Name _____ Respondent's telephone number_____

SECTION B: YOUTH DEMOGRAPHIC CHARACTERISTICS

B1. Age (in years): …….
B2. Age distribution 1. Below 18 years ( ) 2. 18 – 25 years ( ) 3. 26 -35 years ( ) 4. Above 35years( )
B3. What is your gender? 1. Male ( ) 2. Female ( )
B4. Years of formal education ……..
B5. Level of education 1. Primary( ) 2. Secondary( ) 3.Tertiary ( ) 4. Postgraduate ( ) 5.Informal education( )
B6. Marital Status 1. Married ( ) 0. Not married ( )
B8. What is your household size? (Include yourself): ……
B9. Are you the head of your household? 1= Yes ( ) 0= No ( )
B10. If No in B10, please specify the gender of your household head. 1= Male( ) 0= Female ( )
B11. Please specify the level of education of your Household head
1. Primary( ) 2. Secondary( ) 3.Tertiary ( ) 4. Postgraduate ( ) 5.Informal education( )
B12.1. Level of education in years ……
B13. In which sector is your Household head currently employed? 1= Agriculture ( ) 0= Other sector ( )
B14. How many persons in your household are engaged in agripreneurship? …….
B15. Do you have people/siblings that are dependent on you? 1= Yes ( ) 0= No ( )
B16. If Yes in B15, how many? ……
B17. Which of the following describes your current residence? 1. Rural area ( ) 2.Metropolitan

area ( ) 3.Large city ( )
B18. Were you born in your current residence? 1= Yes ( ) 0= No ( )
B19. If No in B18, which of the following describes your original place of residence (or place of birth registration)? 1. Rural area ( ) 2. Metropolitan area ( ) 3.Large city ( )
B20. What was the main reason for moving to your current residence? 1. To accompany family ( ) 2. For education/training/apprenticeship ( ) 3.To seek employment opportunities( ) 4. Other reasons( ) please specify _____

SECTION C: ENGAGEMENT IN AGRIPRENEURSHIP

C1. Are you currently engaged in agripreneurship? 1= Yes ( ) 0= No ( )
(Follow-up to Questions to C1 only for those who select Yes)- Note: Skip C2- C16 if No was selected in C1
C2. If yes in C1, for how long have you been engaged in agripreneurship (in years)? …….
C3. What inspired your decision to become an agripreneur? (Multiple choice, You can select one or more that apply to you) 1. Exit unemployment ( ) 2. Earn money( ) 3. Pursue an opportunity that I have identified ( )
4. Have prestige / personal accomplishment( ) 5. Satisfy parents' wishes or follow family tradition( )
6. Be independent( ) 7. Dissatisfied with my job( ) 8. Develop solutions to contribute to solving challenges in agriculture( ) 9. Seize financing or training opportunities on agricultural entrepreneurship ( )
10. Encouraged by my environment (media, agricultural entrepreneurs, development organizations) which showed that agricultural entrepreneurship is a good opportunity ( )
11. Make the most of the resources that I had at my disposal "for free" (land, skills, funding, etc.) ( )
12. Other (specify)_____
C4. Which of the following activities best corresponds to what you were doing before you became an agripreneur? (Single choice, select only one) 1. Worked for wage/salaried employment (full- or part-time) ( )
2. Worked as an unpaid family member ( ) 3. Engaged in home duties (including child care) ( )
4. Was unemployed/jobless( ) Others( ) Please specify …….
C5. If 4 in C4, for how long were you unemployed/jobless? ……
C6. Which of the following describes the current location of your business? 1= Urban ( ) 0= Rural ( )
C7. Are you the sole owner of the business? 1= Yes( ) 0= No ( )
C8. In which Value Chain (VC) are you mainly engaged? (Multiple choice, you can select more than one)
1. Production( ) 2. Processing( ) 3. Distribution( ) 4. Marketing( ) 5. Others, Please specify ……..

C9. What level is your business at? (Single choice, select only one)

1. Start-up (I started my activities less than 36 months ago) ( )
2. Growth (The products and services are available in the market and our revenues are increasing) ( )

3. Mature (I have been selling a well-known product/service for several years to an established and secure customer base and we have a substantial market share) ( )

C10. Which of the following categories best describes your business? (Single choice, select only one)
1= Strongly focused on increasing profit for its owners ( )
0= Social enterprise (economic activity aimed at selling a product or service to solve a social problem and not to seek the maximization of profits for its owners) ( )

C11. What would you do if you were offered a job that pays twice the income currently generated by your business? (Single choice, select only one)
1. I will give up my business and take the job ( ) 2. I will keep my business and take the job ( )
3. I will not take the job ( )

C12. As an agripreneur, what are the motivations that keep you in your business? (Multiple choice)
1. Exit unemployment ( ) 2. Earn money( ) 3. Pursue an opportunity that I have identified ( )
4. Have prestige / personal accomplishment( ) 5. Satisfy parents' wishes or follow family tradition( )
6. Be independent( ) 7. Dissatisfied with my job( ) 8. Develop solutions to contribute to solving challenges in agriculture( ) 9. Seize financing or training opportunities on agricultural entrepreneurship ( )
10. Encouraged by my environment (media, agricultural entrepreneurs, development organizations) which showed that agricultural entrepreneurship is a good opportunity ( )
11. Value the resources that I had at my disposal "for free" (land, skills, funding, etc.) ( )
12. Other (specify)_____

C13. How much did you invest in the first year of starting your business? (in USD) (Single choice, select only one)
1. less than 100 ( ) 2. Between 101 and 1000 ( ) 3. Between 1,001 and 5,000 ( )
4. Between 5,001 and 10,000 ( ) 5. Over 10,000 ( )
C14. What was the source of your initial investment? (Multiple choice)
1. Self-financing( ) 2. Donations/grants/Family/Friends( ) 3. Credit from a financial institution( )
4. Personal loans( ) 5. Others( ), Please specify……

C15. What benefits can you attribute to your engagement in agripreneurship? (Single choice, select only one)
1. Financial ( ) 2. Social( ) 3. Others ( ) Please specify …….

C16. What are the major barriers you face as an agripreneur? (Multiple choice)
1. Lack of access to information on business opportunities ( ) 2. Lack of access to finance/capital ( )
3. Lack of access to training( ) 4. Social/cultural constraints( ) 5. Lack of relevant mentors in the field( )
6. Lack of market( ) 7. Social/cultural constraints( ) 8. Others( ), specify……..

SECTION D: PARTICIPATION IN THE ENABLE TAAT PROGRAMME

D1. Are you aware of any Youth agribusiness empowerment programme in your country? 1= Yes ( ) 0= No( )

(Skip D2 -D12, if No was selected in D1)

D2. If Yes in D1, which of the following are you aware of? (Multiple choice)

1. ENABLE TAAT (ET) Programme( ) 2. Other Government programmes( ) 3.Other NGOs programmes( )

4. Others( ), please specify ……..

D3. If 1 in D2, did you participate in the ET Programme? 1= Yes( ) 0= No( )

If Yes, provide the following details (Skip D4- D12, if No was selected in D3)

D4. Facilitator ***(CODE B: below)***	**D5.Duration of the programme** ***(CODE C: below)***	**D6. Areas covered** **(CODE A: below)**
IITA( ) Other organizations( )	1= Less than 1month( ) 2= 1 - 6months( ) 3= 7 - 12months( ) 4= Above 12months( )	1. Business management( ) 2.Financial Management( ) 3. Risk management ( ) 4. Product design and management( ) 5.Record keeping( ) 6. Preparing business plans( ) 7. Marketing( ) 8. Customer relationship( ) 9. Others ( ) , please specify_____

D7. Have you been able to apply or demonstrate the knowledge/skills gained from the programme?

1= Yes ( ) 0= No ( )

D8. If No in D7, why? (Ask if No was selected in D7, Multiple choice)

1. Too complicated to apply/demonstrate ( ) 2.Social/cultural constraints ( ) 3. Lack of follow-up/mentorship( ) 4. Not related to my business needs ( ) 5. Others ( ), Please specify …….

D9. Have you benefitted from any post-training/programme support? 1= Yes ( ) 0= No ( )

D10. If yes in D9, what form of support did you get? (Ask if Yes was selected in D9- Multiple choice)

1. Finance( ) 2. Technical( ) 3. Mentorship and advisory services( ) 4. Farm input( )

5. Others( ), Please specify ……

D11. Do you think your participation in the ET programme influenced your engagement in agripreneurship?

1= Yes ( ) 0= No ( )

D12. How do you perceive the ET as an agribusiness empowerment programme? (Single choice, select only one)

1= Beneficial( ) 0= Non-beneficial( )

D13. Do you think the education/training you received in the past was useful enough to start your own agribusiness firm? 1= Yes ( ) 0= No ( )

D14. Do you have any difficulties accessing agricultural training? 1= Yes ( ) 0= No ( )

D15. If yes in D14, what are the major difficulties you face? (Multiple choice)

1. Distance to training centres ( ) 2. Financial constraints ( ) 3. Busy schedule ( ) 4. Lack of information ( ) 5. Others( ), please specify …….

SECTION E: PERCEPTION OF AGRIPRENEURSHIP AND RELATED PROGRAMMES

E1. Do you perceive agripreneurship as a profitable career choice? 1= Yes ( ) 0= No ( )

E2. In the last 12 months, have you taken any step(s) to establish/expand your own agribusiness enterprise?

1= Yes ( ) 0= No ( )

E3. If Yes in E2, do you intend to continue in agripreneurship for the next 5 years? 1= Yes ( ) 0= No ( )

E4. What do you attribute your decision in E3 to? (Multiple choice)

1. Participation in the ENABLE TAAT programme( ) 2. Participation in other agribusiness programmes( )

3. Personal interest/passion( ) 4. Others( ), please specify ……

E5. In your opinion, does agribusiness training/programmes influence agripreneurial development among young people? 1= Yes ( ) 0= No ( )

E6. Ideally, which of the following type of work would you prefer? 1. Start and run your own agribusiness enterprise() 2. Work in other sectors( ) 3. Run a family agribusiness enterprise( ) 4. Other( ), please specify ……..

SECTION F: Agripreneurship Skills

Instruction: Please write your answer to the statements below and kindly use the rating guide provided)

1-Strongly disagree 2-Disagree 3- Neutral 4- Agree 5- Strongly agree.

S/n	Item	5	4	3	2	1
1	I can recognize business opportunities in agribusiness					
2	I can evaluate an agribusiness opportunity and determine if it is viable					
3	I seek advice and information about an agribusiness venture before its actual implementation					
4	I can find creative ways to develop value-added products for income generation					
5	I can develop innovative and creative ways to ensure the success of an agribusiness firm					
6	I can develop mental models (plans) on how to turn an agriculture opportunity into a business					
7	I often take calculated risks on new ventures (business ideas)					
8	I can bear the uncertainties related to my agribusiness enterprise					
9	I often identify risks before or during the implementation of a new agripreneurial activity					
10	I can successfully implement an agribusiness enterprise					
11	I take agribusiness challenges as learning opportunities					
12	I always plan and schedule my agripreneurial activities					
13	I am always confident that my agripreneurial activities will succeed					
14	I take responsibility for any outcome of the agribusiness venture(s)					
15	When working on an agribusiness venture, I plan and think about the future					
16	I strive to ensure the sustainability of my agribusiness venture(s)/project(s)					
17	I make rational decisions that align with the future goals of my agribusiness venture(s)					
18	I can look for ways to market my agricultural product(s)					
19	I can brand and set the right price(s) for my agricultural product(s)					
20	I can determine the type of agricultural product(s) that my customers want					
21	I can convince others to buy my agricultural product(s)					
22	I have the skills required to convince someone to fund my agripreneurship idea(s)/venture					
23	I feel comfortable entering into a collaborative agribusiness partnership					
24	If the need arises, I can make independent decisions for the success of my agribusiness					
25	I can overcome failures resulting from agribusiness projects and start all over again					
26	I do not easily give up when faced with challenges involving my agribusiness					
27	I like being in control of my agribusiness					

F2. How would you rank your agripreneurship skills before the COVID-19 pandemic compared to today?

1. Better ( ) 2. Same( ) 3. Worse( )

SECTION G: Living condition

On a scale of 1 to 5. Where 1 implies very poor and 5 implies very rich

G1.	How would you rank your economic condition before the pandemic compared to today?	1	2	3	4	5
G2	How would you rank your current economic condition?					
G3	How would you rank the economic condition of your household before the pandemic compared to today?					
G4	How would you rank the current economic condition of your household?					
Satisfaction (1 implies completely dissatisfied and 5 is very satisfied)						
		1	2	3	4	5
G5	Are you satisfied with your current living conditions?					
G6	Are you satisfied with your current household condition?					

G7. Did your living conditions change in the last 3 years? (Single choice, select only one)

1. Improved( ) 2. Unchanged( ) 3. Gotten worse( )

G8. What changes in living standards can you attribute to your engagement in agripreneurship? (Multiple choice)

1. Better accommodation ( ) 2. Steady income ( ) 3. Possession of asset ( ) 4. Affordability of basic needs ( ) 5. All of the above ( ) 6.None ( )

SECTION H: Agripreneurship Performance and Livelihood Indicators

H1. Hired Labour/Employee

H1.1. Do you currently have paid employees? 1= Yes ( ) 0= No ( )

If Yes, Kindly answer the following questions (SKIP H1.2 – H1.7 if No was selected in H1.1)

H1.2. Number of employees before the pandemic	H1.3. Current number of employees as of today	H1.4. Employees between 18-35years	H1.5. Employees above 35years	H1.6. Number of male employees	H1.7. Number of male employees
[____]	[____]	[____]	[____]	[____]	[____]

H1.8 Did you have employees before the pandemic? 1= Yes ( ) 0= No ( )
H1.9 If Yes in H1.8, how many employees did you have before the pandemic? ……
H1.10. Did you have to lay off employees due to the pandemic? 1= Yes ( ) 0= No ( )

H2: Human Assets
H2.1. Knowledge level of Agripreneurship (Single choice, select only one)
1. Highly( ) 2. Moderately( ) 3. Low( ) 4. No knowledge( )

H3: Physical Assets
H3.1. Do you have any physical assets aside from land? 1= Yes ( ) 0= No ( )
If Yes in H3.1, kindly indicate which of the following Assets you have

Assets (*tick appropriately*)	**Current Quantity**	**Current Value (USD)**	**Assets (*tick appropriately*)**	**Current Quantity**	**Current Value (USD)**
1. Houses			2. Agribusiness Equipment		
3. Radio			4. TV		
5. Telephone/Mobile Phone			6. Solar panels		
7. Gas cooker			8. Bicycle		
9. Sewing/knitting machine			10. Bicycle		
11. Motorcycle			12. Car		
13. Electric Cooker			14. Truck/Lorry		
15. Electric Oven			16. Computer		
17. Modem			18. Refrigerator		
19. CD/DVD player			20. Tractor		
21. Borehole			22. Well		
23. Generator			24. Furniture (total)		
25. Well			26. Dam		
27. Fences			28. Commercial buildings		

H3.2. Did you have to sell any of your physical assets due to the pandemic? 1= Yes ( ) 0= No ( )

H4 Agricultural Land Holdings

H4.1. Do you have access to land? 1= Yes ( ) 0= No ( )

H4.2. If yes, how did you acquire it? SKIP H4.2 – H4.3 if No was selected in H4.1

1. Gift and Inheritance( ) 2. Rented( ) 3. Communal( ) 4. Leased( ) 5. Others( ),Please specify …….

H4.3. What is the average size of the land (in hectares)? …….

H5: Financial Assets

H5.1. Do you have a consistent income from your agripreneurship activities? 1= Yes ( ) 0= No ( )

H5.2. How do you finance your agribusiness venture? (Multiple choice)

1. Grants( ) 2. Project financing( ) 3. Family and friends( ) 4. Personal savings( )

5. Bank loan( ) 6. Others( ), Please specify ……

H5.3 Agripreneurship Income

	Income from farm-related activities	**Annual income earned in the last 12 months before the pandemic (USD)**	**After Covid-19: Amount earned in the last 12 months (USD)**
1	Total estimated farm income	[_____]	[_____]
2	Total estimated profit	[_____]	[_____]

H5.4. Do you think there is progress with the profit/income you are making? 1= Yes ( ) 0= No ( )

H5.5. Do you make any contributions to the household monthly income? 1= Yes ( ) 0= No ( )

H5.6. If Yes in H5.5, please state the average amount you contributed to the household's monthly income before the pandemic …… (SKIP H5.6 – H5.7, if No was selected in H5.5)

H5.7. If Yes in H5.5, please state the current average amount you contribute to the household's monthly income ……

H5.8. Where do you get most of your monthly income from? (Single choice, select only one)

1. Agribusiness( ) 2. Unemployment or social security benefits( ) 3. Training allowance or an educational grant ( ) 4. Family and friends( ) 5. Paid employment( ) 6. Others, please specify( ) …….

H6. Off-Farm Income

	Off-Farm income activity – define off-farm- not related to your farm	**Did you receive income from that activity? (*1=YES; 0= NO*)**	**Amount received in the last 12 months (USD)**
1	Salaried employment	Yes ( ) No ( )	
2	Social protection	Yes ( ) No ( )	
3	Non-farm labour wages (household head and spouse)	Yes ( ) No ( )	
4	NET income from business (e.g. posho milling, trading, shops, tailor, charcoal, crafts)	Yes ( ) No ( )	

	Off-Farm income activity – define off-farm- not related to your farm	Did you receive income from that activity? (*1=YES; 0= NO*)	Amount received in the last 12 months (USD)
5	Remittances (from relatives from outside the household)	Yes ( ) No ( )	
6	Renting out equipment/machinery	Yes ( ) No ( )	

SECTION I: PARTNERSHIP AND MEMBERSHIP IN AGRICULTURAL ASSOCIATIONS

I1. Do you belong to an **agricultural** group/association during the last one year? Yes ( ) No ( )

If yes, provide the following information(SKIP I1.2 -I1.4 if No was selected in I1)

I1.1 Group category	I1.2 Major benefits from group	I1.3 Is the group registered? (*1=Yes ; 0= No*)	I1.4 Do you hold any leadership positions in the group? (*1=Yes ; 0= No*)
1. Youth Group (if majority of members are between 18-35 years) ( ) 2.Start-up business association( ) 3. Cooperative society( ) 4. Other (specify)_____	1. Technical support( ) 2. Financial support( ) 3. Information( ) 4. Input and agribusiness services( ) 4. Other (specify)_____	Yes ( ) No ( )	Yes ( ) No ( )

I3. Are you in any form of agribusiness partnership? Yes ( ) No ( )

SECTION J: ACCESS TO AGRICULTURAL-RELATED SERVICES

Extension Services

J1. Did you access agricultural extension services in the last 12 months? Yes ( ) No ( )

If Yes in J1, please answer the following questions (SKIP J2-J3, if No was selected in J1)

J1.1. No. of contacts in the last 12 months	**J1.2. Main Provider** (Single choice, select only one)
	1. Research institute( ) 2.Government extension( ) 3.Other government institutions( ) 4. Other, specify_____

J2. Access to Credit

J2.1 Did you obtain agricultural credit in the last 12 months? Yes ( ) No ( )

If yes, provide the following details

J2.2 Main Source of Credit	**J2.3 Amount borrowed (USD)**	**J2.4 Main Purpose of Credit (*multiple choice*)**	**J2.5 Reason for source**
1.Micro-finance institution( ) 2. Commercial banks( ) 3. Cooperatives ( ) 4. NGOs( ) 5. Government credit schemes( ) 6. Local money lender( ) 7. Group/Table banking( ) 8. Family and friends( )		1. Purchase farm inputs (e.g. seeds, fertilizers e.t.c.) ( ) 2. For marketing and value addition activities ( ) 3. Buy land( ) 4. Construction of farm structures( ) 5. Buy machinery and equipment( ) 6. Payment of labour costs( ) 7. Irrigation facilities( )	1= No collateral( ) 2= Low-interest rate ( ) 3= Easy access ( ) 4= Payment flexibility( ) 5= Others( ), Please specify……..

J3. Market Information

J3.1. Did you access any market information in the last 12 months? Yes ( ) No ( )

J3.2 If Yes, from which source? (Multiple choice) SKIP if No was selected in J3.1

1. Agricultural group( ) 2. Government extension( ) 3. Other government institutions( )

4. Internet sources( ) 5. Family/Friends( ) 6. Other, specify( )

J4. Insurance Services

J4.1 Are you aware of any agricultural insurance services? Yes ( ) No ( )

J4.2 Did you access any agricultural insurance services in the last 12 months? Yes ( ) No ( )

If yes in J4.20, provide the following details (SKIP if No was selected in J4.2)

Insurance type	**Main source of agricultural Insurance (*specify*)**	**Sum Assured (USD)**	**Premium (USD)**	**Level of Satisfaction *of Household Head*** ***(0 below)***
Against livestock loss				[_____]
Against crop loss				[_____]
Agricultural assets (e.g. tractor)				[_____]

1=Very dissatisfied, 2=Dissatisfied, 3=Neutral, 4=Satisfied, 5=Very Satisfied

SECTION K: ACCESS AND USE OF TECHNOLOGIES

K1. Do you use any agricultural technology for your agribusiness? Yes ( ) No ( )

K2. If Yes, which technologies have you accessed and used in the last 2 years (**2019 - 2021**)?

Specify at least one NEW technology/practices	**Main Provider of technology** **(0 *below*)**
	[_____]
	[_____]

MAIN PROVIDER CODES (Single choice, select only one)
1. ENABLE TAAT 2.Agro dealer 3. Research institute 4. Government extension 5. Cooperative society 6. Private company 7. International NGO

K3. What major purpose did you use the technology for? (Multiple choice)

1. Land preparation and Planting( ) 2.Harvesting( ) 3. Marketing( ) 4. Processing( )

5. Distribution( ) 6. Others( ), specify_____

SECTION L: FOOD AND NUTRITION SECURITY

L1. How many meals on average do you take on a normal day in the **peak food availability season**? ……meal(s)

L2. How many meals do you take on a normal day in the **low food availability season**? ……meal(s)

L3. How many **days** in the **past one week** did you eat the following foods and what was the main source?

(If a food item is not consumed, write zero and do not report the source of food. Use the food sources codes to report the main source of food)

	Food items	Number of days the item was eaten/consumed in the last 7 days	Main Food Source over the past 7 days (***0 below)***	What was the situation of the consumption of this food item before the COVID-19 pandemic compared to today? (**CODE D: below**)
A=Cereals	Maize (grain)	[_____]	[_____]	
	Rice	[_____]	[_____]	
	Other cereals	[_____]	[_____]	
B=Root & tubers	Irish/Sweet Potatoes	[_____]	[_____]	
	Cassava	[_____]	[_____]	
	Arrow roots	[_____]	[_____]	
	Yams	[_____]	[_____]	

	Other roots and tubers	[_____]	[_____]	
C=Vegetables	French beans	[_____]	[_____]	
	Cabbages	[_____]	[_____]	
	Local vegetables	[_____]	[_____]	
	Other vegetables	[_____]	[_____]	
D=Fruits	Fresh fruits	[_____]	[_____]	
E=Meat , Poultry	Beef	[_____]	[_____]	
	Goat meat	[_____]	[_____]	
	Poultry	[_____]	[_____]	
	Pork	[_____]	[_____]	
	Fish	[_____]	[_____]	
	Other meats	[_____]	[_____]	
F=Eggs	Eggs	[_____]	[_____]	
G=Fish & Seafood	Fish	[_____]	[_____]	
	Other Seafood	[_____]	[_____]	
H=Pulses/legumes/nuts	Beans	[_____]	[_____]	
	Other pulses	[_____]	[_____]	
I=Milk & milk products	Milk	[_____]	[_____]	
	Others milk products	[_____]	[_____]	
J=Oil/ fats	Edible oils	[_____]	[_____]	
	Butter/margarine and other fats	[_____]	[_____]	
K= Sugar/honey	Sugar	[_____]	[_____]	
	Honey	[_____]	[_____]	

Main food source (Single choice, select only one)	
1. Own production (crops, animals) 2. Borrowed 3. Purchase 4. Exchange labour for food 5. Exchange items for food 6. Gift (food) from family relatives 7. Food aid (NGOs etc.)	Better Same Worse

L4. Was this week a peak food availability season or a low food availability season? 1= Peak, 2=Low 3=Normal

L5. In the last 12 months, were there months in which you did not have enough food to meet your household's needs? 1=Yes( ), 0= No( )

L6. If yes, in which months (in the last 1 year (**August 2020 – September 2021**) did you not have enough food?

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total no. of months (to be *computed*)
[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__ __]

L7. Were there months in which you did not have enough food before the pandemic? 1=Yes( ), 0= No( )

L8. If yes, in which months (in the last 1 year (**January – December 2019**) before the pandemic did you not have enough food?

Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Total no. of months (to be *computed*)
[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__]	[__ __]

SECTION M: Covid-19 and Agripreneurship Performance

M1. Has the current pandemic affected your agripreneurship performance? 1=Yes( ), 0= No( )

M2. If Yes in J1, in what way? (Multiple choice)

1. Reduced sales and income( ) 2. Inability to access credit( ) 3.Reduced number of employees( )

4. Others( ), please specify ……

M3. Kindly select the coping strategy(ies) you adopted during the lockdown (Multiple choice)

1.Online marketing( ) 2.Use of personal savings for business purposes( ) 3.Door-to-door marketing( )

4. Use of technologies in place of labour( ) 5. Group farming/partnership( ) 6. Others( ), please specify

Appendix 6B: Factors Influencing Youth Agripreneurship Skills

Variables	Agripreneurship skills index			
	Pooled	Kenya	Nigeria	Uganda
(Log)Age	0.095	-0.184	-0.249	0.174
Gender	0.019*	0.014	0.031	0.039
Education	-0.080***	0.139***	-0.027	-0.107***
Sector of Household head	0.121***	0.033	0.127**	0.039
Agripreneurship experience	0.008	0.023	0.004	-0.048
Part-time engagement	0.015	-0.059	-0.053	0.151
Access to training	0.095***	0.072	0.323***	0.251***
No of HH Agripreneurs	-0.003	0.066***	0.028	-0.004
Business level	-0.086***	-0.093	0.021	0.052
Current residence	0.075	0.134**	0.170***	0.053
Constant	4.289***	4.122***	4.608***	3.977***

Source: Survey data (2021). ***. **, and * denote statistical significance at 1%, 5%, 10%, respectively