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Can Participation in Agricultural Programmes Improve Youth Agribusiness Performance? Insights from the Enable Programme in East Africa

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Abstract

This study addresses the gap in understanding the impact of agribusiness empowerment programmes on youth business performance in developing countries, taking the case of the ENABLE-TAAT programme in Kenya and Uganda. A multistage sampling technique was used in obtaining primary agribusiness-level data from a sample of 1003 young agripreneurs from the study countries. An Endogenous Treatment Effect Regression (ETER) model was used to identify factors influencing programme participation and impact on youth agribusiness performance. Results show that marital status, agribusiness experience, asset value, credit access, residence, prior programme awareness, and perception were the key determinants of participation. The ETER results chow that participation in the programme significantly increased youth's agribusiness income by 7 percent and food security by 76 percent, with participants having higher asset value than non-participants. Based on these findings, we suggest policy interventions or programmes focusing on youth agribusiness empowerment, particularly those that target young actors along different agricultural value chains. We also suggest interventions geared towards mitigating constraints to credit access by young agripreneurs to ease barriers to working capital and business innovation. To increase access and participation, we recommend strategies to improve youth perception and raise awareness of these programmes.

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1. Introduction

With about 60 to 70 percent of Africa's population below the age of 30 years, the continent has the largest young population in the World (African Development Bank (AfDB) et al., 2017). 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 the youth 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. According to the International Labor Organization (ILO) (2020), the estimated 440 million youths expected to join the labor 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 is a profitable marriage between agriculture and entrepreneurship (Bairwa et al., 2014), whereby a farmer, regarded to 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 (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 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 people engaged across the agricultural value chains.

Specifically, the relevance of agribusiness empowerment programmes to youth engagement in agripreneurship has received significant attention in global agenda and research 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 youth manage funds, while entrepreneurship training helps young people better understand their business environment and create better bankable business plans. Overall, the significance and developmental implications of these programmes for developing countries have been well studied, with primarily descriptive, classificatory, and often historical literature (Akrong et al., 2020; 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 the youth (Korth et al., 2014; Sikwela & Mushunje, 2013; Todo & Takahashi, 2013) who are exposed to intense labor market

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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).

Despite the importance of youth agribusiness programmes, 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 on youth agripreneurship. 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, empirical evidence at cross-country or regional levels is generally lacking. Additonally, the few exiting evaluations focus on the impact of hard skills, while studies considering programmes that combined hard and soft skills are limited. An exemption is Alcid et al. (2022) who assessed the short and medium term impacts of an employability intervention in Rwanda. However, the outcomes of the current study are different from that of Alcid's. 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, addresses this gap by empirically assessing the impact of agribusiness empowerment programmes on the performance of young African agripreneurs taking evidence from the ENABLE-TAAT[1] programme in Kenya and Uganda. The main contributions are as follows. First, we deviate from existing studies by assessing an agribusiness programme that combines technical training, entrepreneurship training, with mentorship, and experimental learning via agribusiness incubations. Second, we followed a quasi-experimental approach to evaluate the impacts of programme participation using a rigorous analytical model. Third, we attempt to distinguish between effects on agribusiness income and food security. This is particularly important since the programme ultimately seeks to improve youths livelihood and economic status. Our study contributes to an emerging body of empirical literature on youth agripreneurship in Africa and generates evidence that could inform national and regional policies

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[1] 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.

as well as assist development partners in recipient 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 describes the data, variable operationalization, and estimation strategy. The results and discussions are presented in section 3. Finally, the paper concludes with the highlights, relevant policy implications, and recommendations for further studies.

2. Materials and methods
2.1 Data 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 and Uganda, two of the pilot countries where the ENABLE-TAAT programme was conducted in 2018, between September and December 2021. These countries were purposively selected for their high number of participants in the programme's pilot year and because they are both in East Africa. Thus, they are assumed to have some common features. This was to ensure result aggregation and make policy recommendations that could be applied in other East African countries.

Before the survey, two focus group discussions (FGDs) were conducted in each study country, with seven young agripreneurs affiliated with the ENABLE-TAAT programme. The essence of the FGDs was to get insights into different aspects of the programmes and identify some of the challenges faced by young agripreneurs in each country. Information obtained from the FGDs was used in refining and validating the survey instrument.

A multistage sampling technique was adopted in selecting the respondents. In the first stage, the study population was stratified into participants and non-participants of the programme. 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), a total of 1038 respondents, comprising 477 participants and 561 non-participants, were randomly selected across the two countries using random numbers generated on Microsoft Excel.

Specifically, the total sample size of 1038 was proportionately shared between the two countries. A total of 421 youths (200 participants and 221 non-participants) were selected in Kenya and 625 youths (277 participants and 340 non-participants) in Uganda. However, out of those selected in Kenya and Uganda, only 398 respondents (194 participants and 204 non-participants) and 605 respondents (277 participants and 328 non-participants), respectively, participated in the survey, giving about a 99 percent response rate. The 1 percent excluded was due to the unavailability and refusal of some respondents to participate. Prior to 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 and the descriptive results are presented in Tables A1 in the appendix.

2.2 Empirical Framework

The Endogenous Treatment Effect Regression (ETER) model was used to identify factors that influenced programme participation decisions and assess the impact on youth performance (Adeyanju et al., 2021; Mensah et al., 2021; Ogunniyi et al., 2018; Zhong et al., 2021). 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 the outcome in the second stage. In this study, we modeled participation decision as a dichotomous variable, which takes the value of 1 for participants and 0 otherwise. The modeling approach follows that an agripreneur will choose to participate in the 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 participation. 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 using the ETER model, which addressed both sample selection and endogeneity biases.

Consider a rational young agripreneurs, 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 1:

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

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 required to include at least a variable, otherwise known as an exclusive restriction, which affects participation but does not directly influence the outcome variables, otherwise, through the selection variable. The restrictive exclusions included in the equation are discussed under the model identification strategy (see Section 2.4).

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

$$Y_i = \mu W_i + \eta T_i + u_i \tag{2}$$

Where Y_i is the outcome variable (business performance, measured as average agribusiness income and food security), W_i represents the covariates/controls which influence business performance; 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 variable (business performance) and expected value of the two error terms are computed as in equations (3) and (4):

$$E(Y_i/T_i = 1) = \mu W_i + E(u_i/X_i, \varepsilon_i) = \mu W_i + E(u_i/\varepsilon_i), \text{ with } E(u_i/\varepsilon_i) \mathrel{!}= 0 \tag{3}$$

$$E(u_i/\varepsilon_i) = E(u_i/\varepsilon_i \leq \alpha X_i) = E(\sigma_u, \rho/\varepsilon_i) = \rho\sigma u\varphi(\alpha X_i)/\Phi(\alpha X_i) \tag{4}$$

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.

2.3 Outcome measures

We focused on two outcome measures which aligns with the key objectives of the ENABLE-TAAT programme: (1) Agribusiness Income; (2) Food security. Agribusiness income was measure 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 produced by each respondent. As a measure of general nutrient intake, we assessed food security calculated using the Food Consumption Score (FCS) constructed based on food consumption information gathered from a list of food items/groups specific to Nigeria (Table A2). The respondents were asked about the number of days each food group was consumed over a preceeding 7days recall period. The consumption frequencies of the food groups were summed, and any frequency value greater than seven was capped at seven. Next, the value obtained for each food group was multiplied by its assigned weight (Table A2). The FCS was computed as the sum of the weighted value of the eight food groups assessed. We excluded oil from the calculation of this measure, as more than 95% of respondents reported taking oil every day during the recall period. The distribution of the three outcome variables is presented in the appendix (Figures A1-A2).

2.4 Identification Strategy

As exclusion 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 business performance, 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 literature have found a positive link between perception and participation in business empowerment programmes or interventions. For instance, Adeyanju et al., 2021 emphasized the relevance of improving youth perception of agricultural-related programmes in increasing participation and ensuring that many young people remain in agricultural careers. The authors stressed the need for programme restructuring to entice the younger generation. This could invariably change youth mindsets about these programmes 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 business performance, such as income from agribusiness activities, except through participation. We measured perception as a binary variable that takes the values of 1 for if a respondent holds a postive perception (i.e., perceiving empowerment programmes generally as beneficial) and zero otherwise.

Prior *Awareness of the ENABLE-TAAT programme* before its implementation is expected to influence youth participation decisions directly and significantly, but not their business performance. This is because those who have prior information about the programme, such as the objectives of the programme, the location, and so on, may find it more worthy of attending than those who are unaware. However, programme awareness is not directly linked to business performance, except through participation. We measured awareness as a binary variable which takes the value of one for those who had information or were aware of the programme before its implementation in 2018 and zero otherwise.

3. Results and discussions

3.1 Validity of Instruments

The tests of the strength of the relationship between the two instruments and the participation variable supported the reliability of the instruments (both variables are correlated with the instrument at $p<0.01$) (Table 1). The *F*-statistic was 413.98 which is above the often-used threshold of 10. Using the LIML estimator, we accept a rejection rate of 10% of a nominal 5% Wald test. We reject the null hypothesis that the instruments are weak since the test statistic of 413.98 exceeds its critical value of 8.68. Based on this test, we concluded that we do not have the issue of weak instruments. We also conducted a test of overidentifying restrictions to verify the validity of the instruments. Based on the insignificance of the Anderson-Rubin chi-square ($p=0.1859$) and Basmann F-statistics (F $(1,999)= 1.743$, $P=0.1870$), we fail to reject the null hypothesis and concluded that our instruments are valid.

3.2 Determinants of youth participation in the ENABLE-TAAT Programme

Table 1 presents the coefficients and marginal effects obtained from the first stage probit model and post-estimation results. The marginal effects, which show the effect of a unit change in the

explanatory variable on the likelihood of programme participation, are reported and discussed. The value of the pseudo R2 (0.492) and the significance (p<0.01) of the Wald Chi-squared value (683.16) show that the model fits well for the analysis. Based on the results, factors that significantly influenced participation decisions include marital status, agribusiness experience, asset value, credit, residence, programme awareness, and perception. For instance, marital status negatively affected participation decisions, implying that married youths 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 9%.

Table 1. Determinants of youth participation in the ENABLE-TAAT Programme

Variables	Coefficient	S.E.	Marginal effect	S.E.
Age (years)	-0.096	0.403	-0.009	0.159
Education (years)	0.145	0.090	0.169	0.179
Gender (Male=1)	-0.033	0.110	-0.014	0.044
Marital status (Married=1)	-0.212*	0.127	-0.092*	0.051
Household size (#)	0.023	0.122	-0.002	0.049
Experience (years)	-0.086***	0.028	-0.033***	0.011
Land size (Hectare)	0.037	0.026	0.016	0.010
(ln)Asset value (#)	0.221***	0.036	0.089***	0.014
Credit (Yes=1)	0.858***	0.114	0.337***	0.041
Extension (#)	0.001	0.004	0.001	0.001
Residence (Rural=1)	-0.360**	0.187	-0.126***	0.068
Partnership	-0.177	0.140	-0.066	0.054
Awareness (=1)	2.068***	0.160	0.625***	0.026
Perception (Positive=1)	1.432***	0.198	0.435***	0.041
_cons	-4.267***	1.304		
LR chi2(14) = 683.16	Log-likelihood	-352.071		
Prob> chi2 = 0.000	Pseudo R2	0.4924		

Source: Field survey (2021). *** p <0.01, ** p < 0.05, * p < 0.1

Years of agribusiness experience was negative and significant at p<0.01, indicating that more years of experience had a negative effect on participation decisions. Considering the marginal effect, a unit increase in the years of agribusiness experience reduced the likelihood of participation by about 3%. 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. (2020), 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 the track record of empowerment programmes. For instance, prior negative experiences could discourage participation.

The higher the estimated value of assets reported by an agripreneur, the more likely they will 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 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.

The direction and significance of access to credit imply that credit access facilitated youth engagement in the programme regardless of the source. One possible explanation is that access to credit facilitates business expansion which could influence agripreneurs to take up 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 may help to maximize their yield to repay the credit on time.

Unexpectedly, rural residence negatively affected participation and reduced the likelihood of participation by about 13%. This was not anticipated considering that most of the participants are residents of rural areas. However, it could be because of the cost implication of participation since the programme was implemented in IITA hubs located in the capital of both countries. Thus, those closer to the capital are more likely to be aware of and participate in the programme.

Respondent's awareness and perception of the programme played a significant role in making participation decisions. The result of the current study shows that respondents aware of the programme before its implementation, either through media or other sources, were more likely to participate than those who were not. Similarly, respondents who perceive the programme as a means of skill acquisition and networking opportunity are more likely to participate. Considering the marginal effects of both variables, those who were aware of the programme before its

implementation had about a 63% probability of participating in the programme than those who were not. Also, those who perceived the programme as beneficial were 44% more likely to participate. The high significance ($p<0.01$) of these variables suggests the need to create more awareness about empowerment programmes and equally design these programmes with desirable qualities that could attract young people.

3.3 ETER model results- impact estimates (Income and FCS)

Table 2 presents the impact estimates obtained for our three outcomes variables using the ETER model. As discussed earlier (sub-section 2.4), the two instrumental variables included to identify the model were statistically significant at $p<0.01$ (Table 1), 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 equations, indicates sample selection bias and endogeneity. This implies that unobserved characteristics influenced the participation decision. Also, the significance (Prob > chi2 = 0.002 and 0.000 for income and FCS, respectively) of the likelihood ratio tests for joint independence confirms a correlation between the selection and outcome equations, indicating that using an Ordinary Least Square (OLS) method could either under or over-estimate the outcome. This further justifies the fitness of the ETER model for the analysis.

Table 2. Impact estimates

Outcome variables	Agribusiness income	FCS
ATT	0.065**(0.032)	0.755**(0.114)
LR test of indep. eqns. (rho = 0):		
chi2(1)	9.96	11.22
Prob > chi2	0.002	0.000
Rho	0.252***	-0.671***

Source: Field survey (2021). *Standard error in parenthesis; *** p <0.01, ** p < 0.05, * p < 0.1*

We found that programme participation led to an approximately 7% increase in agribusiness income, indicating a positive and significant (at $p<0.05$) impact. Also, we found a larger, positive, and significant impact on food consumption (at $p<0.01$), where participation led to about 76% increase in FCS of participants. This higher income obtained could be as a result of the innovative and improved business practices learned from the programme. Beneficiaries received practical

trainings on how to run and manage their agribusinesses. Also, they were exposed to innovative methods of farming and received continuous mentorship from experts. These could have increased their production and subsequently led to higher income and food security. Also, the food security component of the training which includes sensitization on healthy diet could have contributed to the high FCS.

These results agree with Lachaud et al. (2018), who found that an agri-business skills training programme improved the labor market outcomes of young Zimbabwean farmers four years after the programme was conducted. This was attributed to a wide range of innovative support services integrated into agribusiness programmes to improve beneficiaries' technical and managerial skills in order to drive sustainable and profitable production for improved business performance and livelihoods (Kilelu et al., 2022; Koutsouris & Zarokosta, 2020). The results also corroborates Ouko et al. (2022), who posit that efforts to support youth agripreneurship drives poverty reduction among youths, particularly in developing countries. This is because better performance will invariably contribute to wealth creation and the acquisition of more productive resources, which will further drive business expansion and result in higher income.

Our result further addresses the concerns of Ouko et al. (2022) on the effectiveness of programmes in generating better economic and livelihood outcomes for youth. The ENABLE-TAAT programme clearly generated positive economic outcomes for the beneficiaries and, more importantly, could guide them during the start-up stage of their agribusiness life cycle. This is especially important given that respondents had only 4 years of agribusiness experience. This supports previous research that found a positive relationship between programme participation and labor market outcomes (Baiyegunhi et al., 2019; Ojo & Baiyegunhi, 2020). However, our results contradict Alcid et al. (2022) who found no significant impact on employment, income, and consumption which was attributed to the relatively short period between the intervention and when the evaluation was conducted. The authors also explained that it is likely that the altered the participants' expectations, thereby calling for an indepth review of programmes and the need to revisit subjects in evaluations as the measured impacts of interventions may evolve markedly over time.

Our findings are consistent with evidence from other interventions aimed at promoting agricultural

entreprise among young Africans. With the growth of youth agripreneurship in Africa, it is expedient to increase the returns from agricultural activities in order to meet the expectations of young people and keep them in agripreneurship. According to Babu et al. (2020), youth continue to face several constraints, including limited technical know-how and resources, when venturing into agriculture which deters their performance. While these constraints have been well discussed in literature (Bello et al., 2021; Ose, 2021; Ouko et al., 2022), there is a consensus that agribusiness empowerment programmes can potentially guide young agripreneurs and help them maximize the limited resources available to them (Adeyanju et al., 2020; Babu et al., 2020; Mulema et al., 2021; Ogunmodede et al., 2020; Yami et al., 2019).

The positive link between performance and participation found in this study supports this notion, suggesting that young agripreneurs could contribute to African agricultural transformation agendas through increased production. Also, better performance has different positive implications for the economy. First, it can put young people at the forefront of job creation in the informal sector, employment stability, and ensuring the well-being of their families (Ramushu, 2021). Second, it can promote peer-to-peer mentoring, in which successful agripreneurs mentor aspiring agripreneurs in their communities. While this is not the focus of our study, evidence abounds that peer-to-peer mentorship generates better results for intending young agripreneurs and can also help successful agripreneurs contribute to community development (Ramushu, 2021).

3.4. Heterogeneous analysis

To further check the robustness of the impact estimates, we ran different models presented in Tables A3 and A4 (see appendix). Firstly, we ran the ETER model without the control variables. The results showed that participation had positive and significant impact on both income and food security (Table A3). Also, we ran country-specific analysis to account for any spatial differences in the outcomes. The results were similar to the pooled analysis, as participation had positive and significant impact on income and food security in both countries (Table A4).

Additionally, we examined whether impacts vary by gender, residence, and asset ownership. Since agriculture is male-dominated, men are more likely to have better business outcomes and connections than female. Also, they may have access to more productive resources which can potentially raise income and food consumption (Quisumbing et al., 2015). Based on this, we split the sample into different categories based on these three covariates and the interacted participation

with each category to assess the heterogenous impact of participation. First, we split residence into three categories: (a) rural residence (b) metropolitan cities, and (c) Large cities. Also, we had five asset quantiles based on the value of productive assets owned. We then interact participation status by the three residence groups and five asset quintiles while controlling for asset ownership to examine if there is heterogeneity in impacts of participation by asset groups. Results presented in Tables 3 shows that impact do not vary by gender and residence. Rural residence served as the base category for residence while female served as the base category for gender.

Table *3*. Heterogenous analysis by gender and residence

| Variables | Outcomes | | | |
| | Income | | FCS | |
	Coff.	S.E.	Coff.	S.E.
Gender (Male)	0.040	0.027	0.064	0.046
Participation x Gender	-0.016	0.035	-0.036	0.064
Residence (Metropolitan)	0.096	0.060	0.107	0.108
Participation x Metropolitan city	0.013	0.073	-0.187	0.132
Residence (Large city)	0.167	0.140	0.129	0.254
Participation x Large city)	-0.014	0.161	-0.039	0.291
Cons.	7.921***	0.013	3.708***	0.024

Source: Field survey (2021). *** *p <0.01*

Also, using the first quintile as the base category, the results presented in Table 4 show that impacts do not vary by asset groups for the two outcomes (Income and FCS) assessed. This further shows that the youths are resource-poor and need additional support to improve their agribusiness performance and livelihood.

Table *4*. Heterogenous analysis by Asset ownership

Variables	Outcomes			
	Income		*FCS*	
	Coff.	S.E.	Coff.	S.E.
Participation	0.163***	0.049	0.246***	0.090
Asset_q2	-0.057	0.037	0.023	0.068
Participation x Asset_q2	-0.005	0.056	-0.019	0.103
Asset_q3	0.031	0.037	0.068	0.069
Participation x Asset_q3	-0.015	0.056	-0.195	0.103
Asset_q4	0.056	0.038	-0.046	0.070
Participation xAsset_q4	0.038	0.056	-0.111	0.104
Asset_q5	0.036	0.043	-0.035	0.079
Participation xAsset_q5	0.035	0.059	-0.072	0.108
Cons.	7.830***	0.033	3.591***	0.062

Sources: Field survey (2021). ****p <0.01*

4. Conclusions and Implications

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. 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.

The main question addressed in this study is whether participation in agribusiness empowerment programmes can improve the business performance of young agripreneurs. Our findings established that those who participated in the ENABLE-TAAT programme earned higher agribusiness incomes and had higher food consumption scores than non-participants, implying a positive impact of programme participation on both their economic and livelihood outcomes. While this is a more direct impact, increased income is fundamental to business expansion, better economic status, and poverty reduction among rural youths.

As a strategy to continue to promote youth agripreneurship, our findings suggest the relevance of rigorous empowerment/training programmes which incorporates both hard and soft skills as well as continuous mentorship in helping young agripreneurs develop the technical competencies required for better business performance. This is particularly important, considering that many young agripreneurs are low-skilled and inexperienced. Thus, modalities should be drawn by the government and development partners to increase investment in agribusiness empowerment programmes and scale existing programmes beyond the regular one-time period. Also, the significance of the awareness variable on participation suggests that more awareness of agribusiness empowerment programmes that could benefit young people should be created. Given this, information on relevant programmes could be disseminated using innovative platforms such as social media that appeal to young people.

In addition, youth perceptions of these programmes should be improved such that programmes offer attractive incentives that could motivate participation. Also, efforts should include facilitating increased access to credit facilities and support for young agripreneurs who are just starting their ventures to ease off the various socio-economic hardships they face, particularly at the inception of their agripreneurship careers. The government could establish developmental funds/grants targeting young agripreneurs. Also, empowerment programmes could incorporate strategies to improve the creditworthiness of youths in their structure. Furthermore, the positive influence of access to extension on participation suggests that young agripreneurs who are considered to be skill- and resource-poor should be supported to maximize their limited resources for better performance. Specifically, policymakers should develop approaches that support and facilitate youth's access to extension services that promote agriculture as a business.

To the best of our knowledge, this is the first study to assess the impact of a regional programme-ENABLE-TAAT- on business performance in Kenya and Uganda. Despite its significance, the study had limitations. The study is skewed toward young rural agripreneurs. As a result, the findings favor rural youth over peri-urban and urban youths. Future research should broaden the scope of the study to include more young agripreneurs in peri-urban and urban areas. Such studies should also consider evaluating the performance of young agripreneurs by location. 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 productive resources. Since

agripreneurship is a male-dominated sector, female agripreneurs may face tougher work challenges than their male counterparts. Considering that the programme have been implemented in over six African countries, future studies should assess impact in other countries and region in which the programme was implemented and compare results with the current study.

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Appendice

Table A1. Definition of key variables and their expected signs

Variable	Measurement	Pooled (n=1003)	Participants (n=522)	Non-participants (n=481)	Mean diff.
(ln)Income	Natural log of total annual income from agribusiness activities (in naira)	8.01	8.09	7.93	-0.17***
(ln)FCS	Natural log of food consumption score				
Participation	Participation in the ENABLE-TAAT programme (Participant=1, non-participant=0)	0.52	1.00(0.00)	-	-
Age	Age of respondents in years	28.03(4.60)	28.85(4.89)	27.27(4.18)	1.59***
Education	Years of formal education	13.61(1.81)	13.77(1.73)	13.43(1.88)	-0.34***
Gender	Dummy (Male=1, Female =0)	0.53(0.50)	0.53(0.50)	0.53(0.50)	-0.00
Marital status	Dummy (Married=1, otherwise=0)	0.59(0.49)	0.52(0.50)	0.66(0.47)	0.14***
Household size	Number of household members (head count)	5.03(2.07)	4.89(2.07)	5.19(2.07)	0.30**
Experience	Years of agribusiness experience	3.51(2.27)	3.17(2.09)	3.87(2.40)	0.70***
Land size	Hectares of land owned	2.25(2.04)	2.33(1.93)	2.16(2.15)	-0.17
Value of asset	The total value of agribusiness assets	6.28(1.71)	6.65(1.79)	5.87(1.51)	-0.78***
Credit	Borrowed money in the last 12 months Dummy (Yes= 1, No=0)	0.48(0.50)	0.69(0.46)	0.25(0.44)	-0.44***
Extension	Access to extension services Dummy (Yes= 1, No=0)	1.96(16.62)	2.39(22.85)	1.49(3.04)	-0.91
Residence	Current residence (Rural=1, Urban and others=0)	0.90(0.30)	0.89(0.31)	0.90(0.29)	0.01
Partnership	Involved in business partnership (Yes=1, No)	0.19(0.39)	0.18(3.88)	0.20(0.40)	0.02
Perception	General perceptions of agribusiness empowerment interventions/programmes (Positive=1, otherwise=0)	0.83(0.37)	0.99(0.12)	0.67(0.47)	-0.32***
Awareness	Awareness of ENABLE TAAT programme (Aware=1, unaware=0)	0.72(0.45)	0.98(0.14)	0.43(0.50)	-0.55***
Covid-19	Did the pandemic affect major agribusiness activities (Yes=1, No=0)	0.74(0.44)	0.75(0.44)	0.74(0.44)	-0.01

Source: Field survey (2021). Standard deviation in parenthesis; *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A2. Food groups and weight

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 seafoods	Animal protein	4
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)

Table A3. Estimates of the impact of programme on Income and FCS (without controls) (n= 1003)

	Income	FCS
Participation	0.162***	0.323***
	(0.046)	(0.099)
Cons.	8.097***	3.574***
	(0.026)	(0.054)
Instruments		
Perception	0.241***	0.318***
	(0.089)	(0.084)
Awareness	2.211***	2.115***
	(0.251)	(0.247)

Note: Standard error in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table A4. Estimates of the impact of programme on Income and FCS (without controls) (n= 1003)

Variables	Income		FCS	
	Kenya	Uganda	Kenya	Uganda
Participation	0.215***	0.377**	1.063***	0.868***
	(0.113)	(0.098)	(0.031)	(0.220)
Cons.	8.036***	8.004***	3.429***	3.136***
	(0.056)	(0.054)	(0.032)	(0.122)

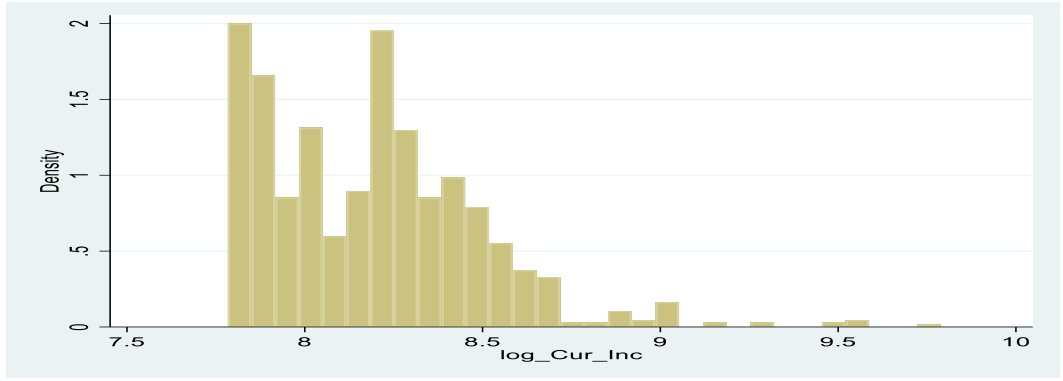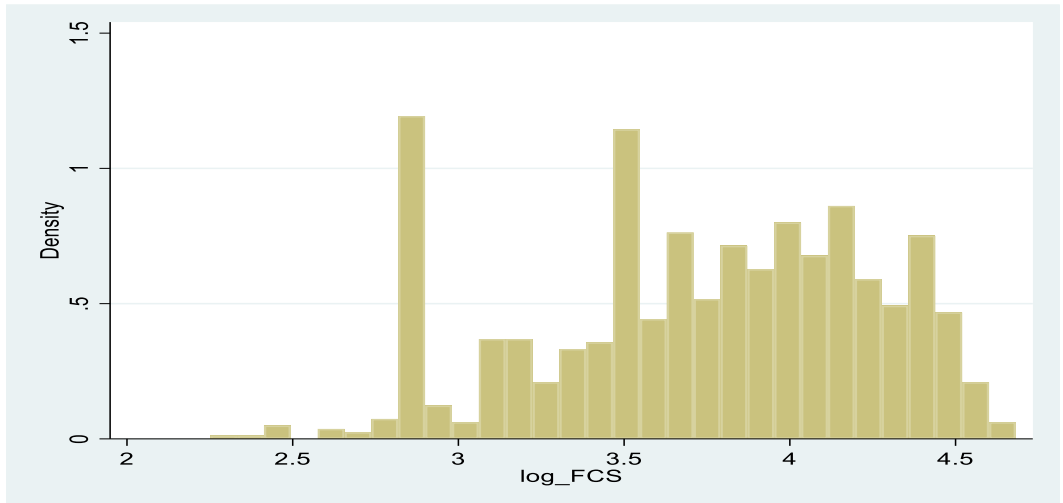Note: Standard error in parenthesis. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Figure A.1. Distribution of agribusiness income

Figure A.2. Distribution of FCS