



# Enhancing Agripreneurship and Agricultural Technology Adoption to Reduce Poverty: Opinions from Small Venture Holders in Tubah Sub-Division, Western Highlands, Cameroon

Paul Akumbom\*, Mary Juliet Bime Egwu & Peter Ngek Shillie

Department of Agribusiness Technology, College of Technology, University of Bamenda, Cameroon

\*Corresponding author: [akumpaulo@gmail.com](mailto:akumpaulo@gmail.com)

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## Research Article

### Abstract

**Purpose:** The purpose of this study is to examine how agripreneurship and agricultural technology adoption could be enhanced to reduce poverty in the Tubah Sub-Division, Cameroon.

**Methods:** The study adopted a mixed research design. The study made use of survey data collected with the help of a structured questionnaire. The data were analyzed using both descriptive and inferential statistics.

**Results:** Results revealed that agripreneurship intention exerts a positive insignificant effect on poverty reduction in the Tubah Sub-Division. Education and training have an indirect significant effect on poverty reduction while community development programs are found to exert a positive and significant effect on poverty reduction.

**Implications:** From a policy perspective, the creation of community-run organizations provides a strong basis for the development process. Agricultural extension services need to be strengthened to provide farmers with up-to-date information on the latest technologies, best practices, and market trends. This study provides a unique perspective on poverty reduction in rural areas by focusing on the opinions of small venture holders in the Tubah Sub-Division.

**Keywords:** Agripreneurship, Technology Adoption, Community development, Poverty reduction.

## 1. Introduction

Agripreneurship has been gaining interest in recent years, particularly among young people who view farming and agriculture as viable career paths. According to a study by the European Investment Bank, there has been an increase in the number of young entrepreneurs entering the agricultural sector in Europe (European Investment Bank, 2019). Many agripreneurs are exploring new business models and innovative farming practices to stay competitive. Agricultural technology adoption is also on the rise in the developed world. Precision farming technologies such as GPS-guided tractors, drones, and sensor networks are becoming more common, allowing farmers to increase yields and reduce costs. According to a report by the Organization for Economic Co-operation and Development (OECD), the use of precision agriculture has the potential to increase yields by up to 17% and reduce fertilizer use by up to 30% (OECD, 2019).

Governments in the developed world are also providing support to agripreneurs and promoting the adoption of agricultural technology. In the United States, for example, the USDA has launched several programs to encourage the adoption of precision agriculture, including the Precision Agriculture Conservation Stewardship Program (USDA, 2021). Sustainable agriculture is also becoming increasingly important in the developed world. Many farmers are adopting practices such as crop rotation, reduced tillage, and the use of natural fertilizers to reduce environmental impact and improve soil health. According to a study by the European Commission, there is a growing demand for sustainably produced food in Europe, with consumers willing to pay a premium for products that meet certain sustainability standards (European Commission, 2019). Agripreneurship and agricultural technology adoption in the developed world are positive, with many opportunities for innovation and growth. However, challenges such as climate change, resource scarcity, and the need for sustainable practices will continue to shape the future of agriculture in these regions.

Agripreneurship and agricultural technology adoption in developing countries are complex and vary depending on the country and region. However, there are some common challenges and trends that can be identified. According to Lowder, Skoet, and Raney (2016), many small-scale farmers in developing countries lack access to modern agricultural technologies, such as improved seeds, fertilizers, and mechanization. This is due to a combination of factors, including limited financial resources, poor infrastructure, and a lack of knowledge and skills.

Agripreneurs often struggle to access the capital they need to invest in their businesses. According to FAO (2014), this is due to a lack of financial institutions that understand the unique needs of agribusinesses and are willing to provide financing, as well as the perception that agriculture is a risky sector. Poor roads, limited access to markets, and inadequate storage facilities can make it difficult for agripreneurs to transport and store their products, limiting their ability to reach customers and earn a profit (Lowder et al., 2016).

Many developing countries do not have supportive policies and programs that encourage agripreneurship and agricultural technology adoption. This includes limited investment in research and development, inadequate extension services, and a lack of incentives for private-sector investment (IFAD, 2017). Climate change is having a significant impact on agriculture in developing countries, with changing weather patterns, an increased frequency of extreme weather events, and rising temperatures affecting crop yields and food security (FAO, 2016).

Despite these challenges, there are some positive trends in agripreneurship and agricultural technology adoption in developing countries. According to IFAD (2017), there is a growing interest in sustainable agriculture practices and innovative business models that combine traditional farming practices with modern technologies. Additionally, there are a growing number of private sector actors, such as social enterprises and impact investors, who are investing in agripreneurship and agricultural technology in developing countries. Finally, there is a growing recognition of the importance of agriculture for economic development and food security, which is leading to increased investment in the sector by governments and international development organizations (Lowder et al., 2016).

The agriculture sector is a significant contributor to the economy of Cameroon, accounting for approximately 20% of the country's GDP and employing approximately 50% of the labor force (World Bank, 2022). Agripreneurship, defined as the entrepreneurial activities involved in the agriculture sector, has been identified as a crucial driver of economic growth and development in Cameroon (Ndubuisi et al., 2021).

The adoption of agricultural technologies, such as improved seeds, fertilizers, pesticides, and irrigation systems, has the potential to significantly increase agricultural productivity and income, leading to overall economic growth (Spielman et al., 2018). In Cameroon, the government has been promoting the adoption of agricultural technologies through various initiatives, such as the creation of agricultural research institutions and the provision of subsidies for the purchase of agricultural inputs (Ndubuisi et al., 2021).

In addition to the adoption of agricultural technologies, the promotion of agripreneurship has also been identified as a key factor in driving economic growth in Cameroon. This involves creating an enabling environment for agricultural entrepreneurship, through the provision of access to finance, training and education, market information, and networking opportunities (Ndubuisi et al., 2021). Agripreneurship has the potential to create jobs, generate income, and contribute to the overall economic growth and development of Cameroon (Spielman et al., 2018). However, challenges such as limited access to finance, inadequate infrastructure, and insufficient market linkages need to be addressed to fully realize the potential of agripreneurship and agricultural technology adoption in Cameroon's economy.

Tubah Sub-Division is an agricultural region in Cameroon that has the potential for agripreneurship and agricultural technology adoption. However, there are several challenges facing farmers and agripreneurs in the area, including limited access to finance, poor infrastructure, inadequate knowledge and skills, and a lack of market access. These challenges hinder the growth and development of the agricultural sector in the region.

According to a World Bank (2018) report, farmers and agribusiness owners in Cameroon face a significant challenge with access to finance. The paper highlights the need for the government to establish policies that promote access to credit for farmers and agribusinesses. The report also recommends the provision of technical assistance and financial literacy training to improve the creditworthiness of small-scale farmers and agripreneurs. Against this background, the following objectives were investigated;

- To analyze the effect of agripreneurship intention on poverty reduction in the Tubah Sub-Division.
- To determine the effect of education and training on poverty reduction in the Tubah Sub-Division.
- To explore the effect of community development programs on poverty reduction in the Tubah Sub-Division.

## 2. Literature Review

Swinnen and Vandeplass (2010) examined the factors that can enhance agricultural investment and contribute to poverty reduction in Africa. The study used a literature review and case studies to identify the factors that can enhance agricultural investment and poverty reduction in Africa. The study found that factors such as access to finance, infrastructure, and technology can enhance agricultural investment and contribute to poverty reduction in Africa. Enhancing agricultural investment can be an effective way to reduce poverty in Africa, and policies that address the factors that affect agricultural investment can help achieve this goal.

Ghebru and Holden (2014) examined the effects of land certification and registration on agricultural efficiency and productivity in Ethiopia. The study used a survey of 800 households and a difference-in-difference approach to analyze the effects of land certification and registration on agricultural efficiency and productivity. The study found that land certification had a positive effect on agricultural efficiency and productivity, while land registration had no significant effect. Land certification can be an effective way to enhance agricultural efficiency and productivity, which can contribute to poverty reduction in Ethiopia.

Adhikari and Gautam (2019) analyzed the impact of agricultural commercialization on income and poverty reduction in rural Nepal. The study used a survey of 350 households and a propensity score matching approach to analyze the impact of agricultural commercialization on income and poverty reduction. The study found that agricultural commercialization had a positive and significant impact on income and poverty reduction in rural Nepal. Agricultural commercialization can be an effective way to reduce poverty in rural areas, and policies that promote agricultural commercialization can help achieve this goal.

Gruère and Nagarajan (2012) analyzed the relationship between agricultural markets and poverty reduction in India. The study used a literature review and case studies to analyze the relationship between agricultural markets and poverty reduction in India. The study found that agricultural markets can contribute to poverty reduction in India by creating employment opportunities, increasing access to food, and improving agricultural productivity. Improving agricultural markets can be an effective way to reduce poverty in India, and policies that promote agricultural market development can help achieve this goal.

Mwaura and Mwanarusi (2019) examined the role of agribusiness in enhancing entrepreneurship and food security among rural women in Kenya. The study used a survey of 200 rural women and a regression analysis to analyze the role of agribusiness in enhancing entrepreneurship and food security. The study found that agribusiness can enhance entrepreneurship and food security among rural women in Kenya by providing access to finance, training, and markets. Promoting agribusiness can be an effective way to enhance entrepreneurship and food security among rural women in Kenya, and policies that support agribusiness development can help achieve this goal.

Qian and Smyth (2020) examined the impact of microcredit on poverty alleviation and agricultural entrepreneurship in rural China. The study used a survey of 305 households and a regression analysis to analyze the impact of microcredit on poverty alleviation and agricultural entrepreneurship. The study found that microcredit had a positive and significant impact on poverty alleviation and agricultural entrepreneurship in rural China. Microcredit can be an effective way to reduce poverty and promote agricultural entrepreneurship in rural areas, and policies that support microcredit programs can help achieve these goals.

Mafimisebi and Oladejo (2018) examined gender differences in agribusiness entrepreneurship and poverty reduction among rural farmers in Nigeria. The study used a survey of 200 rural farmers and a regression analysis to analyze gender differences in agribusiness entrepreneurship and poverty reduction. A study found that gender had a significant impact on agribusiness entrepreneurship and poverty reduction in rural Nigeria, with male farmers having greater access to resources and better outcomes than female farmers. Addressing gender disparities can be an important factor in promoting agribusiness entrepreneurship and reducing poverty among rural farmers in Nigeria, and policies that promote gender equality can help achieve these goals.

Wambugu and Ombati (2017) examined the role of agribusiness entrepreneurship in poverty reduction among smallholder farmers in Kenya. The study used a survey of 120 smallholder farmers and a regression analysis to analyze the role of agribusiness entrepreneurship in poverty reduction. The study found that agribusiness entrepreneurship had a positive and significant impact on poverty reduction among smallholder farmers in Kenya. Rahman and Huq (2016) examined the impact of entrepreneurship development on poverty alleviation in the agriculture sector in Bangladesh. The study used a survey of 400 households and a regression analysis to analyze the impact of entrepreneurship development on poverty alleviation. The study found that entrepreneurship development had a positive and significant impact on poverty alleviation in the agriculture sector in Bangladesh.

Siahi, Khoshroo, and Pourreza (2015) examined the role of agribusiness entrepreneurship in rural development and poverty reduction in Iran. The study used a survey of 200 agribusiness entrepreneurs and a regression analysis to analyze the role of agribusiness entrepreneurship in rural development and poverty reduction. The study found that agribusiness entrepreneurship had a positive and significant impact on rural development and poverty reduction in Iran.

Adekanye and Daramola (2015) examined the impact of agribusiness entrepreneurship on poverty reduction among rural farmers in Nigeria. The study used a survey of 200 rural farmers and a regression analysis to analyze the impact of agribusiness entrepreneurship on poverty reduction. The study found that agribusiness entrepreneurship had a positive and significant impact on poverty reduction among rural farmers in Nigeria.

Kiptum and Kipsat (2014) examined the role of agribusiness entrepreneurship in enhancing rural livelihoods and poverty reduction in Kenya. The study used a survey of 100 smallholder farmers and a regression analysis to analyze the role of agribusiness entrepreneurship in enhancing rural livelihoods and poverty reduction. The study found that agribusiness entrepreneurship had a positive and significant impact on rural livelihoods and poverty reduction in Kenya. Maonga and Haule (2013) examined the impact of agribusiness entrepreneurship on poverty reduction among smallholder farmers in Tanzania. The study used a survey of 200 smallholder farmers and a regression analysis to analyze the impact of agribusiness entrepreneurship on poverty reduction. The study found that agribusiness entrepreneurship had a positive and significant impact on poverty reduction among smallholder farmers in Tanzania.

Kaganzi, Ferris, Barham, and Abenakyo (2016) identified the determinants of successful agribusiness entrepreneurship among youth in Uganda. The study used a survey of 350 young agribusiness entrepreneurs and a logistic regression analysis to identify the determinants of successful entrepreneurship. The study found that access to finance, market information, and mentorship were significant determinants of successful agribusiness entrepreneurship among youth in Uganda. Providing access to finance, market information, and mentorship can help enhance the success of agribusiness entrepreneurship among youth in Uganda and promote poverty reduction.

Umar and Lawal (2020) examined the moderating role of education in the relationship between agribusiness entrepreneurship and poverty reduction in Nigeria. The study used a survey of 246 agribusiness entrepreneurs and a hierarchical regression analysis to examine the moderating role of education. The study found that agribusiness entrepreneurship had a significant positive impact on poverty reduction in Nigeria, and education moderated this relationship, strengthening the effect of entrepreneurship on poverty reduction.

Donfouet, Menard, and Yitbarek (2019) identified the determinants of agricultural entrepreneurship and its impact on household poverty reduction in Cameroon. The study used a survey of 524 households, a probit regression analysis to identify the determinants of agricultural entrepreneurship, and a generalized estimating equation to examine the impact of entrepreneurship on poverty reduction. The study found that access to credit, access to extension services, and education were significant determinants of agricultural entrepreneurship, and entrepreneurship had a significant positive impact on household poverty reduction in Cameroon.

Kariuki, Nzaku, and Muradian (2020) examined the impact of agricultural entrepreneurship on poverty reduction in rural Kenya and identified the factors that influence successful entrepreneurship. The study used a survey of 200 smallholder farmers and a multivariate regression analysis to examine the impact of agricultural entrepreneurship on poverty reduction and identify the factors that influence successful entrepreneurship. The study found that agricultural entrepreneurship had a significant positive impact on poverty reduction in rural Kenya and that access to finance, training, and market information were significant factors that influenced successful entrepreneurship.

Aryal, Chalise, and Sun (2018) examined the role of agricultural entrepreneurship in poverty reduction in Nepal. The study used a survey of 300 farmers and a path analysis to examine the relationships among agricultural entrepreneurship, income diversification, and poverty reduction. The study found that agricultural entrepreneurship had a significant positive impact on income diversification and poverty reduction in Nepal and that income diversification partially mediated the relationship between entrepreneurship and poverty reduction.

Owusu, Abdulai, and Abdul-Rahman (2021) examined the impact of agricultural entrepreneurship on rural household income and poverty reduction in Ghana. The study used a survey of 316 households and a propensity score matching analysis to examine the impact of agricultural entrepreneurship on household income and poverty reduction. The study found that agricultural entrepreneurship had a significant

positive impact on household income and poverty reduction in Ghana. Promoting agricultural entrepreneurship can be an effective way to reduce poverty in rural areas of Ghana, and policies that support entrepreneurship development can help achieve this goal.

Ajayi, Oyeyinka, and Amao (2018) investigated the factors influencing the adoption of agricultural technologies among smallholder farmers in sub-Saharan Africa. Data was collected from 300 smallholder farmers using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and logistic regression analysis. The study found that education, access to credit, extension services, farm size, and perception of technology significantly influenced the adoption of agricultural technologies among smallholder farmers in sub-Saharan Africa.

Aromolaran, Akerele, and Akinlade (2019) assessed the effects of agricultural technology adoption on rice productivity in Nigeria. Data was collected from 320 rice farmers using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and regression analysis. The study found that agricultural technology adoption significantly influenced rice productivity in Nigeria.

Asante and Villano (2020) conducted a systematic review of the factors influencing the adoption of agricultural technologies by smallholder farmers in sub-Saharan Africa. The study used a systematic review approach to analyze the existing literature on the adoption of agricultural technologies by smallholder farmers in sub-Saharan Africa. The study found that education, extension services, access to credit, access to information, and perception of technology significantly influenced the adoption of agricultural technologies by smallholder farmers in sub-Saharan Africa.

Balde, Yigezu, and Mugeru (2020) investigated the factors influencing agricultural technology adoption and its implications for smallholder farmers' food security in Ethiopia. Data was collected from 400 smallholder farmers using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and regression analysis. The study found that access to credit, access to extension services, access to markets, access information, and education significantly influenced agricultural technology adoption and its implications for smallholder farmers' food security in Ethiopia.

Chukwuma and Obi (2019) investigated the role of information and communication technology (ICT) in agribusiness entrepreneurship development in Nigeria. Data was collected from 280 agribusiness entrepreneurs using a structured questionnaire. The data were analyzed using descriptive statistics and regression analysis. The study found that information and communication technology (ICT) significantly influenced agribusiness entrepreneurship development in Nigeria.

Dachung, Akanbi, and Agwu (2018) analyzed the effect of access to credit on agricultural productivity among smallholder farmers in Plateau State, Nigeria. Data was collected from 270 smallholder farmers using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and regression analysis. The study found that access to credit significantly influenced agricultural productivity among smallholder farmers in Plateau State, Nigeria.

Ejem, Anyanwu, and Maduabuchi (2018) investigated the influence of market access on smallholder farmers' agricultural productivity in Nigeria. Data was collected from 360 smallholder farmers using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and regression analysis. The study found that market access significantly influenced smallholder farmers' agricultural productivity in Nigeria.

Gebrehiwot and Belay (2019) identified the determinants of farmers' willingness to adopt improved maize varieties in the Tigray region, of Ethiopia. Data were collected from 400 maize farmers using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and regression analysis. The study found that education, farm size, access to extension services, access to credit, access to markets, and perception of improved varieties significantly influenced farmers' willingness to adopt improved maize varieties in the Tigray region, Ethiopia.

Ghosh and Saha (2018) investigated the role of women in agriculture in India. Data were collected from 200 female farmers using a structured questionnaire. The data were analyzed using descriptive statistics,

correlation analysis, and regression analysis. The study found that women played a significant role in agriculture in India, with most of them engaged in subsistence farming.

Kassie, Teklewold, and Shiferaw (2018) investigated the adoption and impact of improved groundnut varieties on rural poverty in Uganda. Data was collected from 4,680 households using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and regression analysis. The study found that the adoption of improved groundnut varieties significantly reduced rural poverty in Uganda.

Kebede and Gebremedhin (2018) identified the determinants of agricultural technology adoption among rice farmers in Ethiopia. Data was collected from 240 rice farmers using a structured questionnaire. The data were analyzed using descriptive statistics, correlation analysis, and regression analysis. The study found that access to credit, access to extension services, education, and farm size significantly influenced agricultural technology adoption among rice farmers in Ethiopia.

Kolawole and Ogunniyi (2021) explored the factors influencing agricultural technology adoption among smallholder farmers in Nigeria. Data were collected from 200 smallholder farmers using a structured questionnaire and analyzed using descriptive statistics and logistic regression analysis. The study found that age, education, farm size, access to credit, access to extension services, and attitude toward innovation significantly influenced agricultural technology adoption among smallholder farmers in Nigeria.

### 3. Material and Methods

In June 2022, a survey was done on the households in the Tubah Sub-Division of Cameroon's North-West Region to find out how agripreneurship (ENT) affected the reduction of poverty. The goal was to find out how agripreneurship helped people get out of poverty. The area of study is the Tubah Sub-Division of the North-West Region of Cameroon. Tubah Sub-division is located between latitudes 4°50' and 5° 20 N and longitudes 10°35' and 11° 59 E of the Green Wish Meridian (Ndenecho, 2009). The researchers adopted a mixed research design. Survey and causal approaches were used to express future predictions of the phenomenon under study. The sample size of 384 households was derived based on the Taro Yamane formula (Israel, 1992). The sample size formula is as follows:

$$n = \frac{N}{1 + Ne^2} \tag{1}$$

Where the parameters;

n = represents the sample size

N= represents the total number of households in Tubah

e = is the margin of error (usually 0.05)

N=9321

$n = \frac{9321}{1 + 9321(0.05)(0.05)} = 384$  households

The data was gathered with the help of a structured questionnaire and analyzed using both descriptive and inferential statistics. The following econometric model was drawn to show the relationship between dependent and independent variables.

$$PR = \beta_0 + \beta_1 EINI_i + \beta_2 EDU_i + \beta_3 CDP_i + \beta_4 age_i + \beta_5 edu_i + \beta_6 vocat_i + \beta_7 lon_i + \beta_8 vott_i + \beta_9 cig_i + \epsilon_i$$

Where

PR stands for poverty reduction

EIN stands for agripreneurship intention

EDU represents education and training

CDP is community development programs

Age is the age of the respondent

Edu stands for the educational attainment of the respondents

Vocat stands for the vocational training status of the respondents  
 Lon is longevity in venture  
 vott stands for vocational training time of the respondents  
 cig means the common initiative group

Where  $\epsilon_1$  is the idiosyncratic term that captured other possible factors that can affect poverty reduction; it is assumed to be constant.

Model parameters were estimated using the ordinary least squares method. This is because it has been frequently utilized in the literature and has the best linear unbiased estimator (BLUE) characteristic. The calculated coefficients are a faithful representation of the population parameters, and the estimator is considered to be efficient since it has the lowest variance compared to alternative estimators. When the dependent variables take values between negative infinity and positive infinity, the OLS method of estimation is applied. The questionnaires were divided into three sections (Sections A, B, and C). Section A of the questionnaire consisted of questions relating to participants' biographical information, section B constituted elements of the independent variable while section C focused on the dependent variable (poverty dimension). Questions were framed with inspiration drawn from other studies such as that of Alkire and Santos (2010) on acute multidimensional poverty. The items were arranged using a 5-point Likert scale and the respondents indicated the extent to which they agree or disagree with each of the statements by ticking [ $\surd$ ] where necessary. The independent variable, agriprenurship, and agricultural technology adoption were measured using agriprenurship intention, education and training, and community development programs. The dependent variable, poverty reduction, was measured using the socio-economic dimensions of poverty including standard of living, health, and education. We evaluated the scaling and consistency of each variable using reliability measures based on Cronbach's (1951) alpha. The proposed cutoff for confirmatory (exploratory) studies has to be higher than 0.70 (Cronbach, 1951; Nunnally & Bernstein, 1994) which it met.

**4. Result and Discussion**

Table 1 presents a summary of descriptive statistics of all the variables included in the empirical model of this study.

**Table 1: Descriptive statistics of the study**

Variable	Obs	Mean	Std. Dev.
pr	384	25.52083	7.2996
enti	384	14.42448	3.919493
edut	384	9.375	3.553397
cdp	384	12.67448	4.41937
age			
3	384	.3177083	.4661928
4	384	.5	.5006523
edu			
3	384	.3229167	.4682012
4	384	.4895833	.5005437
5	384	.0598958	.2376033
vocat	384	1.671875	.4701432
lon			
2	384	.4713542	.49983
3	384	.0572917	.2327023
vott	384	1.375	.5958954
cig	384	1.763021	.4257842

Source: Field Survey, June (2022)

From observation, it is seen that poverty reduction has a mean value of 25.52 while its minimum and maximum values are 16 and 4s respectively, and its deviation from the mean is calculated to be 7.2996. The researcher can also observe that the mean of agriprenurship intention is 14.42 while its minimum



and maximum values are 8 and 22 respectively, and the standard deviation is calculated as 3.91. It is further observed that the mean of education and training is 9.37 while its minimum and maximum values are 5 and 18 respectively, and its deviation from the mean is calculated as 3.55. Community development programs have a mean value of 12.67 with their minimum and maximum values being 6 and 23 respectively, and their deviation from the mean is calculated to be 4.41.

To identify a potential multicollinearity issue, it was necessary to do a correlation study on the independent variables. The results of the pairwise correlation analysis are presented in Table 2 below:

**Table 2: Pair-Wise Correlation Matrix**

	enti	edut	cdp	age	vocat	lon	vott	cig
enti	1.0000							
edut	0.2334	1.0000						
cdp	0.0000	0.0000	1.0000					
age	0.7008	0.4599	0.0067	1.0000				
vocat	0.0281	0.0599	0.0067	0.5829	1.0000			
lon	0.1155	0.0426	0.0641	-0.1016	0.0237	1.0000		
vott	0.0306	0.0658	0.0792	0.0372	0.1469	0.5683	1.0000	
cig	-0.0203	0.0086	0.0108	0.0703	-0.0349	0.6923	0.0000	1.0000
	0.8875	0.2785	0.4377	0.0573	0.0000	0.0031	0.8604	

Source: Field Survey, June (2022)

The unitary nature of the correlation coefficients along the diagonal demonstrates that there is a complete positive correlation between each variable in Table 2. There is a positive connection between several of the independent variables in the table, while there is a negative correlation between some of the explanatory factors. At 1%, 5%, and 10%, the degree of correlation among many is significant, while just a few explanatory factors are not. Moreover, there is little overlap between the independent variables (below 0.6). Therefore, it follows that multicollinearity among the variables is impossible. However, it is not possible to conclude this from the correlation coefficient alone, since such a strong correlation can just be the result of random chance. Therefore, a formal test for multicollinearity is what we must do. In the next sections of this chapter, the researcher will use a variance inflation factor (VIF) analysis to determine whether or not inflation has occurred.

Table 3 below shows the relationship that exists between the dependent variable and a set of independent variables. According to the data in the table, there is a positive coefficient of 0.1374405 for the agripreneurship intention variable, suggesting that this variable has a direct impact on reducing poverty in the Tubah Sub-Division of the North West Region of Cameroon. Agripreneurship education has a significant and positive effect on college students' agripreneurship intention, but not on agripreneurship attitude, as found by Xianyue Liu, Chunpeilin, Guanxi Zhao, and Dali Zhao (2005); entrepreneurial self-efficacy has a significant and positive effect on both entrepreneurial attitude and entrepreneurial intention, and agripreneurship attitude further partly mediates the relationship between the two. According to research conducted by Tae, Shanshan, Chao, and James (2014), there is no correlation between formal agripreneurship education and post-college entrepreneurial aspirations. Swinnen and Vandeplas (2010) found that factors such as access to finance, infrastructure, and technology can enhance agricultural investment and contribute to poverty reduction in Africa.

**Table 3: Ordinary Least Square Result**

Variable	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]
enti	.1374405	.085202	1.61	0.108	-.0301003 .3049813
edut	-.1277679	.0759287	-1.68	0.093	-.2770737 .0215379
cdp	1.246433	.0825937	15.09	0.000	1.084021 1.408845
age					
3	.5811451	.7123271	0.82	0.415	-.8195723 1.981862
4	.0381499	.6498767	0.06	0.953	-1.239765 1.316065
edu					
3	.4490335	.8049697	0.56	0.577	-1.133856 2.031923
4	.0450425	.7825585	0.06	0.954	-1.493778 1.583863
5	-.6826941	1.342884	-0.51	0.611	-3.323336 1.957948
vocat	.3858406	.7095309	0.54	0.587	-1.009378 1.781059
lon					
2	-.6780583	.558166	-1.21	0.225	-1.775634 .4195172
3	1.701456	1.536178	1.11	0.269	-1.319279 4.722191
vott	-.4394486	.532913	-0.82	0.410	-1.487367 .6084694
cig	.2646807	.7161707	0.37	0.712	-1.143595 1.672956
_cons	8.323042	1.894259	4.39	0.000	4.598177 12.04791
				F(13, 370)	= 48.03
				Prob > F	= 0.0000
				R-squared	= 0.6279
				Adj R-squared	= 0.6148

Source: Field Survey, June (2022)

Tubah Sub-Division, located in Cameroon's North West Region, benefits indirectly from education and training as a means of combating poverty. The pace at which poverty is being reduced in the Tubah Sub-Division of Cameroon's North West Region will not decrease proportionally with increases in education and training. Still, there is a statistically significant effect size in this case. Research by Naminse and Zhuang (2018) found that farmer agripreneurship is most affected by farmers' socio-cultural competence (= 0.50, p0.001). The quality of farmer agripreneurship growth has a greater impact on rural poverty than farmers' attitudes about agripreneurship growth (= 0.69, p0.001). This may be a sustainable, community-driven approach to reducing poverty in rural America's most remote regions. At least 60% of the people who benefitted from the skill-building effort are now able to purchase the essentials of life, according to research by Ilemona, Akoji, and Matthew (2013). This result contradicts the findings of Dohse and Walter (2010), who argued that schooling increases entrepreneurial aspirations by inspiring rather than preparing students (as indicated by PBC) for a future in business ownership. This result is in line with previous case studies (Gorman et al., 1997) as well as quasi-experimental research (Souitaris et al., 2007), so educators and researchers in the field of agripreneurship should talk about how complementary offerings might aid in the transmission of crucial know-how and skills. Business students and science and engineering students have different sets of subjective norms, and addressing them may need a tailored entrepreneurial environment (EE), as suggested by Daniela, Rainer, Norbert, and Birgit (2016). They found that EE was most beneficial for those majoring in business as well as science and engineering. However, subjective norms have a detrimental impact on the EI of scientific and engineering students while having no discernible impact on the EI of business students. Herin (2004) shows that environmental influences have an impact on the decision to start a business.

The result showed that community development programs have a positive relationship with poverty reduction in the Tubah Sub-Division of the North West Region of Cameroon. Community development programs have a coefficient of 0.379, which implies that when there is an increase in community development programs by a unit, poverty reduction in the Tubah Sub-Division of the North West Region of Cameroon will increase by 1.246. This result is statistically significant at the 1% level of significance, making the variable community development programs a good determining factor of poverty reduction in

the Tubah Sub-Division of the North West Region of Cameroon. However, Oguntimehin, Abiodun, and Olaniran (2017) found that agripreneurship education significantly influenced the willingness of students at Ogun state-owned colleges to participate in agripreneurship activities for the sake of self-engagement, therefore, these results don't add up. There is a strong correlation between demographic factors like gender and parental job status and the entrepreneurial aspirations of entrepreneurship education students. It is also shown that exposing tertiary students to agripreneurship education raises their degree of agripreneurship awareness, motivates them to show a high level of dedication to agripreneurship, and instills in them a positive outlook on the process of starting their own businesses. The impact of the assessed variables on intentions was shown to be substantial by Doan and Sung (2018). The results suggest that education has crucial implications for the growth of agripreneurship, both qualitatively and quantitatively, laying the groundwork for future entrepreneurial success.

Importantly, the whole model was significant at the 1% level, and the combined variance of all explanatory variables accounted for almost all of the observed variation in positive impacts on poverty reduction in the Tubah Sub-Division of the North West Region of Cameroon. Furthermore, because the VIF test reveals no multicollinearity across independent variables, it follows that the findings are credible. After reviewing a number of studies, both theoretical and empirical, Steward (2005) concluded that the provision of social support and social learning inside CIGs is the most important aspect of their success. Studying three organizations (one of which was a mutual help organization for people with severe mental illness), Maton and Salem (1995) found that the reasons these organizations are so empowering are because they have a belief system that inspires growth, an opportunity role structure that is pervasive, highly accessible, and multi-functional, a support system that is all-encompassing, peer-based, and provides a sense of community, and leadership that inspires and guides people to achieve their full potential. Using a participative approach, training, and capacity development are all aided by CIGs, as stated by Rajakutty (2004), in the process of launching one's own business. Women are able to access infrastructure, technology, financing, and marketing opportunities because of CIGs, which serve as hubs for promoting cluster-based activities and distributing these resources (Sethi and Atibudhi, 2001; Borbora and Mahanta, 2001; Namboodri and Shiyani, 2001; Sharma, 2001; etc.). Because of this, CIGs can increase members' economic stability via IGAs, asset development, and savings mobilization (Borbora & Mahanta 2001, Singh & Sehrawat, 2001 Pandian & Eswaran, 2002; Akudugu, 2010). According to Nirmala et al. (2004), CIG membership encourages members to take part in social services, take collective action, learn new skills, and adapt more effectively to technological advancements. Boga and Nakka (2005) found that after participating in CIGs, low-income families were not only more knowledgeable about health and associated concerns but also increased their spending on food and clothes. The membership also saw an improvement in their ability to administer their organizations and their level of awareness of educational concerns. Some members' work status improved, they said, since they had better access to productive resources like loans. These members now had more options for how to make a living. For the variable age, the age group between 20\_30 was the base age group. The researcher reported results for two age groups: 31\_40 (3) and 41\_50 (4). The result shows that being in the two categories of age group generally has a positive effect on poverty reduction in the Tubah Sub-Division of the North West Region of Cameroon, though all were found to be statistically insignificant.

In the same light, given the variable educational attainment of respondents, primary school was the base group. It is observed from the results that ordinary-level secondary school and advanced-level secondary school were found to exert a positive but insignificant effect on poverty reduction in Tubah Sub-Division of the North West Region of Cameroon, while an advanced diploma or university degree was found to exert a negative effect on poverty reduction in Tubah Sub-Division of the North West Region of Cameroon.

Vocation training has a positive coefficient value, which indicates that vocational training exerts positive effects on poverty reduction in the Tubah Sub-Division of the North West Region of Cameroon. This finding is, however, statistically insignificant.

Results from the table above also reveal that longevity affected poverty reduction in Tubah Sub-Division both positively and negatively, with the variable longevity of respondents' base year being 5. It is observed from the results that those who have been venturing for about 5\_10 (2) years were found to exert a negative insignificant effect on poverty reduction, while the group of 10+ years was found to exert a positive insignificant effect on poverty reduction.

Also, the result shows that vocational training has a positive relationship with poverty reduction. Vocational training has a coefficient of 0.3858406, which implies that when there is an increase in vocational training by 1 unit, poverty reduction will increase by 0.386. This result is statistically insignificant, making the variable vocational training not too good to explain poverty reduction.

More findings revealed that time spent on vocational training was found to exert a negative effect on poverty reduction. In terms of marginal value, a unit increase in vocation training time will lead to an increase in poverty of 0.43945 units, everything being equal. However, this finding was found to be statistically insignificant.

Lastly, the variable common initiative group has a positive coefficient value. This is an indication that common initiative groups exert positive effects on poverty reduction. This means that increasing common initiative group membership and/or groups will increase poverty reduction. This finding was statistically insignificant given a probability value of 0.712. Importantly, the whole model was significant at the 1% level, and the combined variance of all explanatory variables accounted for almost all of the observed variation in positive impacts on poverty reduction in the Tubah Sub-Division of the North-West Region of Cameroon. Furthermore, because the VIF test reveals no multicollinearity across independent variables, it follows that the findings are credible.

**Table 4: Variance Inflation Factor (VIF) Test for Multicollinearity**

Variable	VIF	1/VIF
enti	2.08	0.480507
edut	1.36	0.736138
cdp	2.49	0.402202
age		
3	2.06	0.485924
4	1.98	0.506202
edu		
3	2.65	0.377254
4	2.86	0.349254
5	1.90	0.526352
vocat	2.08	0.481566
lon		
2	1.45	0.688473
3	2.38	0.419347
vott	1.88	0.531381
cig	1.74	0.576297
Mean VIF	2.07	

Source: Field Survey, June (2022)

The result of VIF indicates that there is no major problem with multicollinearity as the mean VIF does not exceed 2.5. In the context of OLS regression, several authors have justified the use of mean VIF as a criterion for assessing the severity of multicollinearity. O'Brien (2007) argues that a mean VIF of 2.5 or greater indicates the presence of moderate to severe multicollinearity. He notes that this threshold is consistent with the rule of thumb proposed by Neter et al. (1996) and also corresponds to the point at which the R-squared value for a regression model begins to level off. Kutner et al. (2005) suggest that a mean VIF of 5 or greater is a sign of serious multicollinearity. They note that this threshold is based on

simulation studies and empirical evidence and that it is also consistent with the rule of thumb proposed by Neter et al. (1996). Gujarati (2003) recommends using a mean VIF of 10 or greater as a criterion for identifying severe multicollinearity. He notes that this threshold is based on the results of simulation studies and is also consistent with the rule of thumb proposed by Neter et al. (1996).

**Table 5 :Breusch-Pagan/Cook-Weisberg Test for Heteroskedasticity**

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity	
Ho: Constant variance	
Variables: fitted values of pr	
chi2(1) =	0.04
Prob > chi2	= 0.8504

Source: Field Survey, June 2022

Finally, we conclude the section by checking for the existence of the issue of heteroscedasticity within our model. To achieve this, we employ the Breusch Pagen and Cook Weisberg test of heteroskedasticity. From the result presented above, the null hypothesis of constant variance is not rejected, showing that our estimated model does suffer from heteroscedasticity. Several authors have discussed the use of heteroscedasticity in ordinary least squares (OLS) regression and have suggested rejection thresholds for detecting heteroscedasticity. White (1980) proposes a test for heteroscedasticity and suggests a rejection threshold of 5%. Greene (2000) discussed the consequences of heteroscedasticity and suggested a rejection threshold of 10%. Kennedy (2003) discussed the various tests for heteroscedasticity and suggested a rejection threshold of 5%.

## 5. Conclusion and Policy Implications

This paper is sought to examine how agripreneurship and agricultural technology adoption can be enhanced to reduce poverty in the Tubah Sub-Division of the North West Region of Cameroon. The study adopted a mixed research design. The data for this study was gathered with the help of a structured questionnaire and analyzed using both descriptive and inferential statistics. This study contributes to the existing literature on poverty reduction in rural areas, particularly in the agricultural sector, by focusing on the opinions of small venture holders in the Tubah Sub-Division. The study findings can inform policymakers and other stakeholders in designing programs and interventions that promote agripreneurship and the adoption of agricultural technologies.

From a policy perspective, agricultural extension services need to be strengthened to provide farmers with up-to-date information on the latest technologies, best practices, and market trends. Encouraging farmers to work together in cooperatives can help them access markets, share resources, and benefit from economies of scale. Farmers need to be trained on how to run profitable agribusinesses and develop an entrepreneurial mindset to create value from their agricultural produce. Innovative technologies, such as precision agriculture, can help small farmers optimize their production and reduce waste. Access to infrastructure, such as good roads, electricity, and water supply, is essential for farmers to reach markets and access basic services. In conclusion, enhancing agripreneurship and promoting the adoption of agricultural technologies are crucial for poverty reduction in Tubah Sub-Division. The recommendations provided can help stakeholders design effective interventions to improve the lives of small farmers in the region.

## 6. Limitations and direction for future research

The study focused only on the opinions of small venture holders, which may not provide a comprehensive understanding of the factors that affect agripreneurship and agricultural technology adoption in the area. Future studies may compare the perspectives of small venture holders with other stakeholders in the

agricultural sector, such as government officials, agricultural extension agents, and agricultural input providers, to provide a more comprehensive understanding of the opportunities and challenges facing the sector.

**Authors' Contributions:** Paul Akumbom conceived the idea, reviewed the literature, analyzed the data, and prepared the first draft. Mary Juliet Bime Egwu did the econometric analysis, supervised it, and finally edited the paper. Peter Ngek Shillie reviewed the paper and suggested improvements. All authors approved the final version of the manuscript.

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