



POVERTY LEVEL AMONG FLUTED PUMPKIN FARMERS FACING HIGH PRODUCTION COSTS IN OGUN STATE, NIGERIA

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ABSTRACT

The poverty situation in Nigeria has been eminent in the lives of smallholder farmers living in a hazardous environment with no access to basic services, good health, education and nutrition, coupled with low income and consumption levels. The study was carried out to investigate the poverty level of fluted pumpkin farmers in Ogun State, Nigeria. A multistage random sampling procedure was used in the selection of respondents for this study. The findings of the study shows that a significant majority (82.5%) of the vegetable farmers were living below the poverty line, which was set at 26,500 Naira per month. Mixed cropping technology was found to be significant at 1% level of probability with a negative coefficient of 0.117. The farming experience was also identified as a significant determinant affecting their poverty levels. The education of the farmers was also a significant factor that affect the poverty level of the vegetable farmers. The negative coefficient of 0.21 implies that a 1% increase in the farmers' education will lead 21% decrease in their poverty level. Poverty alleviation can be achieved among fluted pumpkin farmers in the study area by putting into consideration the various techniques of vegetables cultivation and education of the farmers.

Keywords: Cost, Copping, Techniques, Cultivation, Poverty, Vegetables

INTRODUCTION

Nigeria is a resource-rich nation with an ample supply of arable land, river water, enormous tracts of land for construction, and a large reservoir of human capital and other resources. With a projected population of over 200 million in 2020 (Population Reference Bureau (PRB), 2017; Worldometer, 2020), Nigeria is the most populated country in Africa and ranks seventh globally in terms of population. It is also the world's largest exporter of crude oil, along with a wealth of other resources. Despite all these natural endowment, Nigeria is ranked 158th out of 189 nations in the Human Development Index as of 2018, with 39.1% of its population living below the poverty line and earns less than the US\$1.90 per day, which is significantly less than that of other sub-Saharan African nations like Mozambique (68.7%), Rwanda (60%), and Zambia (64.4%) (UNDP, 2018; UNDP, 2016). The 2018-2019 study on global poverty shows that almost 3 million more Nigerians fell into poverty, bringing the total number of people living in extreme poverty in the country to over 91 million. According to the World Poverty Clock (2018), 86.9 million Nigerians make less than 1.90 USD per day. When it comes to the number of people living in extreme poverty, Nigeria leads the African continent with 86.9 million, followed by Tanzania, Kenya, South Africa, and Zambia, with 19.9 million, 14.7 million, 13.8 million, and 9.5 million, respectively (Worldwide Poverty Clock, 2018). In 2018, Nigeria was ranked higher than India as one among the world's poorest nations in the Brookings Institution annual assessment. In Nigeria, poverty was quite low before the country gained independence in 1960. But Nigeria went from having a low rate of poverty to having one of the highest rates in the world today, 64 years after winning independence. Smallholder farming has great potential for poverty alleviation and can lead the country to self-sufficiency in agricultural production due to its vast and abundant natural resources (Eden, 2005). The poverty situation in Nigeria has been eminent in the lives of smallholder farmers living in a hazardous environment with no access to basic services, good health, education and nutrition, coupled with low income and consumption levels. According to World Bank (2018), anyone living below the adopted measurement line of US\$1.90 per day per person is an indication of extreme poverty. Poverty has been described as weakness in major areas of human well-being. This includes malnutrition, analphabetism, low life expectancy, poor health, reduced participation in socio-economic life and inhospitable habitant (AFDB, OECD and UNDP, 2016).



Poverty is usually measured by monetary indicators or livelihood indicators. In 2015 according to World Bank, (2020), there were approximately 735 million people living in extreme poverty. Of this number, most of the people resided in rural areas of Sub-Saharan Africa and South Asia.

Despite the efforts made by different administrations to combat poverty since 1980, Nigeria failed to meet the targets set by the Millennium Development Goals (MDGs) by 2015. It has not been possible to eradicate poverty, no matter how hard trying democratic and military administrations have tried. Therefore, poverty continues to be a significant barrier to Nigeria's socioeconomic growth despite a number of efforts (Danaan, 2018).

The fluted pumpkin, *Telfairia occidentalis*, is one of the most significant vegetable crops farmed in southern Nigeria and a significant part of agricultural output (Samson, 2019). One important and well-liked vegetable in West Africa is the fluted pumpkin (*Telfairia occidentalis*) which belongs to cucurbitaceae family (Akanni-John, 2020). It is a fruit-bearing leafy vegetable. Their production is still heavily influenced by Nigerian agriculture and is a staple of the national diet. The names for it are Ugu in Igbo, Ugwu in Yoruba, and Nkong in Ibibio/Efik. The vegetable is made up of 3% moisture, 35.58% fat, 5.25% ash, 10.20% protein, 3.50% crude fiber, and 42.27% carbohydrates are all present in fluted pumpkin making the vegetable one of the most nutritious among others which may positively influence the farmers food security status, (Food and Agriculture Organization, 2020). Fluted pumpkin (*Telfairia occidentalis*) is an indigenous vegetable in Nigeria that is preferred to other vegetables due to its nutritional content and is sought after, making it a potential crop for poverty alleviation (Edokpolor, 2017). This study was carried out to investigate the impact of farmers' planting techniques on their poverty level.

MATERIALS AND METHODS

This study was carried out in Ogun State, South-west, Nigeria. Ogun State lies between latitude 6° 54' 35.4" N of the equator and longitude 3° 15' 30.11" E of the Greenwich meridian (NBS, 2023). Ogun State is made up of four Agricultural Development Programme zones, namely; Ilaro zone, Ikenne zone, Abeokuta zone and Ijebu ode zone, (Afodu, *et al*, 2019). The state has a land area of 16,980 sq. km, with a projected population of 7 million by 2025 (NBS, 2023). The state has twenty local government areas, and the vegetation is evergreen forests and savanna. The major crops grown in the state are cocoa, oil palm, rice, cassava, cotton and vegetables. Sampling technique.

A multistage random sampling procedure was used for this study. The first stage involved the purposive selection of two Agricultural Development Programme zones (Ikenne and Ijebu ode). The second stage involved the random selection of two local government areas per zone based on the concentration of vegetable farmers. Thirdly, six farming communities were randomly selected from each local government area making a total of twenty-four (24) farming community. Lastly, ten fluted pumpkin farmers were randomly selected from each farming community giving a sample size of 240 from the study area. The sample size was drawn from the sample frame which consist of six hundred and twenty-five registered vegetable farmers.

A well-structured questionnaire was administered to collect socio-economic information of households such as age, education level, marital status, sex, income, household size, farm size. Additionally, data of poverty level of the farmers were collected, this includes access to credit, access to public health services, total expenditure on food.

A range of analytical techniques was employed in this study to comprehend the impact of the various coping techniques on poverty level of the vegetable farmers. These tools can be broadly divided into descriptive and inferential statistics. While Mean Per Capita Household Expenditure (MPCHE) was used to calculate the poverty line. The inferential statistics consist of the logit regression model. Logit regression was adopted to analyze the effect of planting coping techniques on vegetable farming household poverty status.

The model is specified as: $Y_i = \gamma_0 + \sum \gamma_j x_j + \epsilon_j \dots(1)$

$Y_i = \gamma_0 + \gamma_1 IR + \gamma_2 MC + \gamma_3 UC + \gamma_4 age + \gamma_5 sex + \gamma_6 hhs + \gamma_7 edu + \gamma_8 farsize + \gamma_9 coopmem + \gamma_{10} marstatus + \gamma_{11} fexp + \gamma_{12} acccredit + \epsilon_i$

Where: Y_i = poverty level [Poor = 0, Non-poor = 1]



IR = Input Reduction
MC = Mixed Cropping
UC = Use of Credit
Age = Age of the Farmers [in years]
Sex [Male = 1, Female = 0]
Hhs = Household Size [Number]
edu = Educational Status [in years]
Farsize = farm size [hectare]
Coop Mem = Cooperative Membership [yes = 1, no = 0]
Marstatus = Marital status [Married = 1, single = 0]
fexp =Farming experience [in year]
ei = Random term

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Vegetable Farmers

Table 1 presents the socio-economic characteristics of the vegetable farmers in the study area. The result indicates that there are more female vegetable farmers (54.6%) than male farmers (45.4%). Furthermore, the participation of female vegetable farmers in cooperative meetings is significantly higher compared to their male counterparts. This finding contrasts with some previous studies conducted in the same area, such as Afodu *et al.* (2022), which reported different gender dynamics in agricultural participation and engagement in cooperative activities. Specifically, Afodu *et al.* (2022) found that male farmers generally dominated the agricultural sector and were more actively involved in cooperative meetings. The current data, however, suggests a shift in gender roles within vegetable farming in the region, with women now taking a more prominent and active role. This change could be attributed to various factors, including increased support for women in agriculture, targeted empowerment programs, or socio-economic shifts encouraging more female participation in farming and cooperative activities. The higher frequency of female attendance at cooperative meetings could also imply that women farmers are more proactive in seeking support, resources, and knowledge through these gatherings. This proactive approach may reflect their critical role in managing farm activities and ensuring household food security. It also highlights the importance of considering gender-specific strategies when designing agricultural policies and support programs to effectively address the needs and challenges faced by both male and female farmers.

The study indicates that the majority of vegetable farmers in the area are in their active age, with approximately 48.5% of them falling within the age range of 31 to 40 years. This demographic trend suggests that vegetable farming in the region is predominantly undertaken by individuals who are in their most productive and physically capable years. Being in the 31 to 40-year age range, these farmers are likely to possess the energy, strength, and enthusiasm required for the physically demanding tasks associated with vegetable farming. This age group also tends to be more open to adopting new farming techniques and technologies, which can lead to increased productivity and innovation in farming practices. Studies have shown that younger farmers are often more willing to experiment with improved agricultural practices and are better at leveraging modern technologies to enhance farm outputs (Adebayo & Oladele, 2013; Tologbonse *et al.*, 2010). Furthermore, this active age group is crucial for the sustainability and future growth of the agricultural sector. Younger farmers can drive the sector forward by integrating new ideas and practices that older generations might be less inclined to adopt. According to Mangal *et al.* (2019), engaging the youth in agriculture is essential for maintaining agricultural productivity and ensuring food security, as it helps in replenishing the aging farming population with new energy and ideas. The presence of a younger farming population also has socio-economic implications. Younger farmers are more likely to seek training and participate in agricultural extension services, thereby improving their knowledge and skills. They are also more likely to be involved in cooperative activities and other forms of collective action, which can enhance their access to resources, markets, and support services (Aina & Omonona, 2012).



This suggests that the industry is primarily driven by individuals who are in their prime working years, which can be beneficial for productivity and innovation. On the other hand, only 15.5% are between 21 to 30 years, and 19.6% between 41 to 50 years. And 12.4% between 51 to 60 years, and finally 4.1% above the age of 60. This may highlight a potential gap in experience and knowledge transfer, as older farmers generally possess valuable insights and practices gained over time. To ensure the sustainability and growth of the industry, it may be important to encourage intergenerational exchange and mentorship programs to leverage the expertise of older farmers and support younger ones. The marital status of the respondents shows that 74.2% were married, and 25.8% of them were single. Table 1 also displays the educational levels of the respondents in the study area. It was observed that they had formal education, 17.5% of the respondents had completed primary education, 46.4% of the respondents had completed secondary education, 36.1% of the respondents had completed tertiary education.

The distribution of family size among respondents indicates the varying number of people living together in a household. A majority (66%) of the respondents, 66% reported having 4 to 6 people in their family. A smaller proportion (6.2%) had a household size with more than 7 persons living in their household. Meanwhile, 27.9% of the respondents had 1 to 3 persons living in their household.

This passage describes the farm size distribution among the vegetable farmers, as shown in table 1, the Table provides the proportions of farmers with different plots of farmland. It was observed that 79.4% had between 1 to 3 plots of land, 13.4% had 4 to 6 plots of farmland, 6.2% had 7 to 9 plots of farmland and 1.0% had 12 and above plots of farmland.

Majority of the farmers 56.8% had a farming experience of 1 to 10 years, 24.8% had a farming experience of 11 to 20 years, 11.3% had a farming experience of 21 to 30 years, 3.1% had a farming experience of 31 to 40 years and 4.1% had a farming experience of 41 and more years.

Most (68.0%) of the vegetable farmers did not belong to any cooperative association, while 32.0% belonged to a cooperative association.



Table 1: Socioeconomic Characteristics of the Respondents

Variable	Frequency	Percent	(mean + SD)
Sex			
Male	109	45.4	
Female	131	54.6	
Total	240	100.0	(1.5464 +.50043)
Age			
21-30	37	15.4	
32-40	116	48.3	
41-50	46	19.2	
51-60	29	12.1	
>60	12	5.0	
Total	240	100.0	(41.2577+12.68142)
Marital status			
Single	62	25.8	
Married	178	74.2	
Total	240	100.0	(1.2577 +.43966)
Educational level			
Primary school education	42	17.5	
Secondary school education	111	46.4	
Tertiary education	87	36.1	
Total	240	100.0	(3.1856 +.711195)
Family size			
1-3	67	27.9	
4-6	158	66	
7- above	15	6.2	
Total	240	100.1	(4.2577 +1.76941)
Farm size			
1-3	191	79.4	
4-6	32	13.4	
7-9	15	6.2	
12- above	2	1.0	
Total	240	100.0	(2.9381 +2.17378)
Farming experience			
1-10	136	56.8	
11-20	60	24.8	
21-30	27	11.3	
31-40	7	3.1	
41- above	10	4.1	
Total	240	100.0	(13.0309 +11.1537)
Do you belong to a cooperative association?			
Yes	77	32.0	
No	163	68.0	
Total	240	100.0	(1.6804 +.46874)
Do you have access to credit			
Yes	124	51.5	
No	116	48.5	
Total	240	100.0	(1.4585)

Field survey (2024)

Poverty Level of the Respondents

Table 2 reveals the poverty levels among vegetable farmers during a period characterized by high input costs. The finding reveals that a significant majority (82.5%) of the vegetable farmers were living below the poverty line, which was set at 26,500 Naira per month. This threshold was determined



using the mean per capita household monthly income. Conversely, only 17.5% of the farmers managed to earn an income above this poverty line. The high cost of inputs, such as seeds, fertilizers, pesticides, and irrigation equipment, significantly impacts the financial stability of farmers. When input costs rise, farmers face higher production expenses, which can erode their profit margins and make it difficult to achieve a sustainable income. This situation is exacerbated for small-scale farmers who often lack the financial resources to absorb these increased costs without compromising their livelihood (Olagunju *et al.*, 2020). The finding shows that 82.5% of the fluted pumpkin farmers were below the poverty line and this highlights the vulnerability of this group to economic shocks and fluctuations in the cost of agricultural inputs. High input costs can lead to reduced farm productivity and profitability, pushing more farmers into poverty. According to Ali *et al.* (2018), the economic viability of farming is closely linked to the cost of inputs, and when these costs rise disproportionately, it places a significant burden on farmers, particularly those with limited financial resources.

Furthermore, poverty among farmers can have broader implications for food security and rural development. Farmers below the poverty line may struggle to invest in improved farming practices, adopt new technologies, or access quality education and healthcare, which can perpetuate a cycle of poverty and underdevelopment. As noted by World Bank (2019), poverty reduction in rural areas is critical for achieving sustainable development and improving overall economic growth.

Efforts to support vegetable farmers in managing high input costs could include providing subsidies, improving access to credit, and implementing policies that stabilize input prices. By addressing these challenges, it is possible to enhance the economic resilience of farmers, reduce poverty levels, and promote sustainable agricultural practices (FAO, 2021).

Table 2: Poverty Level among Respondents

	Frequency	Percent
POOR	198	82.5
NON POOR	42	17.5
Total	240	100.0

Field survey (2024)

Coping Strategies Adopted by Fluted Pumpkin Farmers

Table 3 represents the various coping strategies adopted by the vegetable farmers in response to the high cost of production. It is important to note that different farmers opted for different coping strategies based on their unique circumstances and resources available to them. The strategies observed in the study are as follows:

No change in strategy (15.5%): a small proportion of the vegetable farmers (15.5%) did not adopt any strategy in response to the high cost of inputs. This could be due to various reasons, such as lack of awareness, resources, or alternative options.

Input reduction (12.4%): approximately 12.4% of the vegetable farmers reduced their inputs.

Mixed cropping (50.5%): some vegetable farmers adopted a mixed cropping system, integrating crop production or livestock. This approach can help farmers diversify their income sources, reduce input costs by utilizing other methods and enhance overall farm resilience.

Use of credit (21.6%): another strategy adopted by the vegetable farmers was borrowing or getting credit from institutional or non-institutional financial sector to boost their production.

Table 3: Fluted Vegetable Farmers Coping Strategies to High Cost of Production

	Frequency	Percent
Input reduction	30	12.4
Mixed cropping	121	50.5
Use of credit	52	21.6
Did not adopt any strategy	37	15.5
Total	240	100.0

Field survey (2024)



Factors Influencing Poverty Level among Fluted Pumpkin Farmers

Table 4 shows the effect of coping strategies and other determinants of poverty level among the vegetable farmers amidst the high price of inputs. The result of the logistic regression analysis with adjusted R^2 value of 0.50 implies that about 50% of the variations in the determinant of poverty level of the vegetable farmers can be explained by the specific explanatory variables in the model.

Table 4 also demonstrates that the coping techniques adopted by the farmers, along with other socioeconomic characteristics, significantly influence their level of poverty. One of the key findings from Table 4 is the impact of input reduction on poverty levels. The analysis revealed that input reduction has a significant negative coefficient of -0.23, indicating that a unit decrease in the cost of inputs can lead to a 23% reduction in the poverty level of the vegetable farmers. This suggests that lowering the cost of inputs can substantially alleviate poverty among these farmers.

Input reduction can be achieved through various means, one of the most effective being input subsidization. Subsidizing agricultural inputs such as seeds, fertilizers, and pesticides can lower production costs, making it more feasible for farmers to maintain or increase their production levels without incurring additional financial burdens. According to Dorward *et al.* (2008), input subsidies can improve agricultural productivity and income, particularly for smallholder farmers, by reducing the costs associated with essential agricultural inputs.

Furthermore, input subsidization can lead to broader economic benefits for farming communities. By lowering input costs, farmers are more likely to invest in their farms, adopt improved agricultural practices, and increase their productivity. This, in turn, can enhance food security, promote rural development, and stimulate local economies (Morris *et al.*, 2007). For instance, a study by Jayne and Rashid (2013) highlighted that input subsidy programs in Sub-Saharan Africa have contributed to increased agricultural productivity and reduced poverty levels among participating farmers.

In addition to input subsidization, other coping techniques and socioeconomic factors also play a crucial role in influencing poverty levels. These may include diversifying income sources, accessing microcredit, participating in agricultural training programs, and joining farmers' cooperatives. Each of these strategies can enhance the resilience of farmers to economic shocks and improve their overall livelihood (Barrett *et al.*, 2001).

Diversifying income sources, for instance, helps farmers spread their risk and reduce their dependence on a single source of income. Access to microcredit allows farmers to invest in necessary inputs and technology, thereby improving their productivity and income potential. Participation in agricultural training programs can equip farmers with better knowledge and skills, enabling them to adopt more efficient and sustainable farming practices. Joining cooperatives can provide farmers with better access to markets, resources, and support networks (Hellin *et al.*, 2009)

This finding is in line with the study of Kuntashula, E. (2021), who found that Farmers Inputs Support Program (FISP) increases maize production and ensures poverty alleviation and household food security.

From table 4, mixed cropping technology was found to be significant at 1% level of probability with a negative coefficient of 0.117 which shows that an of this technology by one percent will lead to 11.7% increase in poverty alleviation of the vegetable farmers in the study area. This finding is consistent with the findings of Matsuda (2013), who highlighted how crop diversification would stabilize production and income. The findings are in agreement with Megersa, *et al.* (2014), whose study highlighted how livestock diversification increased household food security in Southern Ethiopia. The study of Afodu, *et al.* (2024), further buttress the finding of study. The study observed that poultry farmers who adopted mixed farming techniques were found to be less poor than their counterpart who did not adopt these techniques in South-West, Nigeria.

It was also observed from table 4 that the farmer's age was also a determinant factor influencing the poverty level of the vegetable farmers in the study area. This variable was statistically significant with a negative coefficient showing that younger farmers are likely to be more poverty alleviated than the older farmers. This finding is in line with the findings of Afodu *et al.* (2022), who states that younger farmers are more likely to adopt the best strategies just to reduce the effect of high price of inputs.



The education of the farmers was also a significant factor that affect the poverty level of the vegetable farmers. The negative coefficient of 0.21 implies that a 1% increase in the farmers' education will lead 21% decrease in their poverty level. Studies have shown that education is a panacea to poverty alleviation. The finding of this study is in tandem to the findings of World Bank (2007), which shows that education is central to its strategies for helping countries to reduce poverty and improves their living standard through sustainable growth and investment in people. Feyisa *et al.* (2022) view educational status as a variable which has direct impact on productivity, growth and which is essential to improve human capital.

The vegetable farmers' farming experience was also identified as a significant determinant affecting their poverty levels. The negative coefficient of this variable, indicating a value of -0.14, implies that a 1% increase in the farmers' farming experience results in a 14% decrease in their poverty levels. This finding underscores the importance of experience in enhancing the economic stability and productivity of farmers.

Farming experience plays a critical role in shaping a farmer's ability to effectively manage resources, adopt efficient farming practices, and make informed decisions that enhance productivity and income. Experienced farmers tend to have better knowledge of soil management, pest control, crop rotation, and other agronomic practices that can improve yield and reduce costs. According to Adeoti *et al.* (2012), experienced farmers are more adept at mitigating risks associated with agricultural production, which can lead to more stable and higher incomes.

Moreover, experienced farmers are likely to have established stronger networks and relationships within the agricultural community, including access to markets, credit facilities, and extension services. These networks can provide valuable support in times of need and contribute to improved access to resources and information. A study by Age *et al.* (2014) found that farmers with more years of experience were better at leveraging social capital to enhance their farming operations and economic outcomes.

Experience also enhances a farmer's ability to innovate and adapt to changing conditions. As noted by Doss and Morris (2001), experienced farmers are often more open to adopting new technologies and practices that can boost productivity and profitability. This adaptability is crucial in an environment where external factors such as climate change, market volatility, and policy shifts can significantly impact agricultural production.

Additionally, the accumulation of farming experience over time contributes to the development of skills that are essential for efficient farm management. These skills include financial management, labor management, and strategic planning, all of which are critical for reducing costs and maximizing returns. According to Alene and Manyong (2007), experienced farmers are more likely to implement cost-effective strategies and optimize the use of available resources, leading to higher profitability and reduced poverty levels.



Table 4: Factors Affecting the Poverty Level of Fluted Pumpkin Farmers in Ogun State Nigeria

Variables	Coefficient	Standard Error	T
(Constant)	1.437	.403	3.569
INPUT REDUCTION	-.230	.132	-1.739
MIXED CROPPING	-.117	.018	-6.500
USE OF CREDIT AND FINANCIAL ASSISTANCE	-.040	.067	-.595
AGE	-.125	.069	-1.822
SEX	-.001	.004	-.325
FAMILY SIZE	-.026	.020	-1.313
EDUCATIONAL LEVEL	-.209	.048	-4.371
FARM SIZE	-.001	.014	-.084
DO YOU BELONG TO ANY COOPERATIVE /ASSOCIATION	.072	.064	1.115
MS FARMING EXPERIENCE	-.038	.099	-.385
	-.014	.004	-3.111
R Square = 0.547			
Adjusted R Square =0.501			

Field survey (2024)

CONCLUSION AND RECOMMENDATION

This study shows that the poverty level of the vegetable farmers during the period of high cost of inputs. It was observed that majority of the vegetable farmers were living below the poverty line (26,500/month) which was estimated using mean per capita household monthly income. Furthermore, the coping techniques adopted by the vegetable farmers and some other socioeconomic characteristics influences their poverty level.

Also, input reduction was found to significantly decrease the poverty level of the farmers, a unit decrease in cost of inputs may lead to 23% reduction of the poverty level of the farmers. The education of the farmers was also a significant factor that affect the poverty level of the vegetable farmers. The finding shows that an increase in the farmers' education will lead to 21% decrease in their poverty level. Studies have shown that education is a panacea to poverty alleviation. Finally, poverty alleviation can be achieved among fluted vegetable farmers in the study area by putting into consideration the various techniques of vegetables cultivation and education of the farmers.

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