

## RESEARCH ARTICLE

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## Effects of commercialization on food security status of cassava producing households in Abia state, Nigeria

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### Abstract

The study examined effects of commercialization on food security status of cassava producers in Abia State, Nigeria. Specifically the study described the socio-economic characteristics of the cassava producers; examined the level of cassava commercialization; estimated mean per capita monthly food expenditure of cassava producing households; assessed the food security status of the cassava producing households; ascertained effect of commercialization on the food security status of the respondents and identified the constrained to commercialization. A multi-stage sampling procedure was employed to select 96 respondents needed for the study. Data analysis was carried out using descriptive and inferential tools such as mean, frequencies, percentage, percentage household commercialization index and food security index. Results showed that the mean age of cassava producing household head was 35.3years. Cumulatively, 93.3% of cassava producing household head had formal education ranging from primary school to secondary with mean household size of 7 persons. Dominant number of the cassava farmers indicated access to credit (75.6%) with mean farm size of 1.9ha and mean farming experience of 9.9years. The result also showed a mean commercialization index of 0.646970. The study area could be regarded as food insecure given that only 35.00% of the households were food secure. The result further indicated that there was a positive relationship between commercialization level and food security in the area. However, instability in government policy (86.67%) and lack of collateral required securing loan (72.22 were major constraints to cassava commercialization in the study area. The study concluded that the proportion of food insecure households is more than the food secure households. Therefore, agricultural policies that promote access of farmers to land and other farm inputs that can lead to increased farm household productivity and income should be implemented.

**Keywords:** Commercialization, Food Security, Food Insecurity, Households.

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### 1. Introduction

Many developing nations that rely heavily on agriculture need to commercialize their subsistence farming in order to thrive economically (World Bank, 2008). The commercialization of subsistence farming is also necessary for the food security and wellbeing of sustainable households. Welfare gains are expected as a result of the realization of comparative advantages, economies of scale, and dynamic technical organizational and institutional change impacts that occur from the interchange of ideas through interactions based on exchanges. This strengthens the connections between agricultural markets' input and output sides (Gebremedhin and Moti, 2010).

According to Otieno et al. (2009), commercialization comprises two components: market orientation (agricultural production intended for the market based

on market signals) and market involvement (products offered for sale and usage of acquired inputs). Nevertheless, there is little differentiation in the research (Jaleta et al., 2009) regarding smallholders' commercialization between their market orientation and their market involvement. Originally, the biggest problems facing Sub-Saharan Africa and the developing world at large were increasing per capita food output and rural incomes. Growth in agricultural productivity has been the primary driver of consistent increases in rural welfare, according to the history of economic development in other parts of the world (Stranberg et al., 1999).

In the past, cassava was only considered a crop for self-sufficiency or food security by Nigerians (Food and Agricultural Organization (FAO), 2011). It is not seen as an agri-food sector that can boost Nigeria's

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economy and bring in foreign cash. Due to the efforts of numerous research institutes and stakeholders in creating enhanced varieties required for industrial and human purposes, cassava has recently been steadily gaining significant position in the global commercial arena (Onyeka et al, 2005).

In order to address low farmer productivity, smallholder farmers have been urged to commercialize their cassava by taking part in output markets more frequently. Commercialization may result in higher farmer incomes, enabling them to invest in pricey technologies and buy more inputs. Thus, it is anticipated that food insecurity and poverty will affect fewer rural farming households in developing countries (Gebreslassie et al., 2015; Olwande and Mathenge, 2011; Wickramasinghe and Weinberger 2013).

The state of smallholder farming now demonstrates that subsistence farming is still practiced by farmers and that the level of commercialization of this type of farming is still too low to allow farmers to enjoy higher revenue (Mahalet, 2007). Smallholder farmers have been unable to take advantage of the welfare benefits of commercialization due to high transaction costs and poor markets. Smallholder farmers cannot gain from commercialization and market integration unless current obstacles are eliminated and improved environmental conditions are established. Strengthening the agricultural sector also means establishing a sustainable environment to improve food security and economic development, as 75% of the impoverished in developing nations reside in rural areas and work in agriculture. In addition to having poor linkages to domestic and international markets and failing to add value to their agricultural output, most small farmers face challenges in producing enough food, with significant losses occurring after harvest (Mahalet, 2007).

Given the number of people who are hungry or malnourished, food security has been a global issue for decades. Between 2014 and 2016, around 795 million people worldwide suffered from hunger and malnutrition (FAO, 2015a). Although food insecurity is a global issue, the problem seems to be severe in Sub-Saharan Africa which ranks highest in the prevalence of undernourishment (FAO, 2019). Recent estimates also show that sub-Saharan Africa trails Southern Asia in terms of the number of undernourished people in the world (Bolarinwa et al., 2020).

According to FAO (2019), approximately 9.8 million Nigerians had severe food insecurity in 2020. If action is not taken to improve the situation, an additional 13.8 million people in Nigeria are expected to experience an acute food shortage crisis in 2021–2022, according to FAO (2019). The majority of developing countries' rural agricultural households, including those that produce cassava, are characterized by food insecurity and poverty. Previous empirical research has connected these issues to the agriculture sector's underwhelming performance (World Bank, 2008; Schneider and

Gugerty, 2010). Because of this, households that grow cassava have continued to focus on subsistence, which has led to an inaccurate accounting of their economic contribution (World Bank, 2018). This is a result of the numerous obstacles they must overcome, including unfavorable past policies, constrictive institutional elements, high transaction costs, and restricted access to markets, technology, infrastructure, finance, and services for the development of skills (World Bank, 2018).

Smallholder farmers are dealing with a lot of issues at the moment, which frequently results in decreased food production and significant post-harvest losses. Furthermore, a sizable portion of these farmers are unable to add value to their produce due to poor market linkages. They frequently depend on unpredictable rains and inadequate infrastructure, including transportation, information, and automation, to market their crops, which leads to output losses. In the view of the above, the study specifically:

- i. Described the socio-economic characteristics of the cassava producing household;
- ii. Examined the level of cassava commercialization of cassava producing household;
- iii. Estimated mean per capita monthly food expenditure of cassava producing households;
- iv. Assessed the food security status of the cassava producing households;
- v. Ascertained effect of commercialization on the food security status of the respondents
- vi. Identified the constrained to commercialization.

The study was guided by the following hypotheses stated in their null forms

H01: Cassava producing household in the study area are food secured

H02: Commercialization of cassava had no significant effect on the food security status of cassava producing households in the study area.

## 2. METHODOLOGY

### Study Area

This study was conducted in Abia State, Nigeria. The State was created on 27th August 1991 out of Imo State and is located in the south-East geopolitical zone of Nigeria. Abia State has a land area of 7,677.20 square kilometers, with a total population of 2,833,999 persons, made up of 1,434,193 males and 1,399,806 females (NPC, 2006). Abia State is located between latitudes 5047'N and 6012'N of the equator and longitudes 7023' E and 8002' E of the Greenwich meridian (NRCRI, 2008). It is bounded to the north and North-East by Anambra, Enugu and Ebonyi states respectively, to the South by Rivers State, to the East and South-East by Akwa-Ibom State and to the west by Imo State (NPC, 2006). Abia State as an agrarian state is richly endowed with land suitable for growing various tropical crops. The climate is essentially tropical humid with annual rainfall of 1500-2600mm distributed throughout the wet season (April to October). The mean

elevation is 22m above sea level. Diurnal temperature varies between 27°C and 31.9°C (NRCRI, 2008).

Food crops grown commercially in Abia State are yam, cassava, cocoyam and maize, while the cash crops include oil palm, cocoa, rubber, banana, pineapples and different types of fruits. Livestock such as goats, sheep, cattle, pig and poultry are reared in the state. Trading also occupy a prime position (Emerole, 2004). The agricultural institutions in Abia State include: National Root Crop Research Institute, Umudike, Michael Okpara University of Agriculture, Umudike, Ministry of Agriculture and Rural Development Umuahia, Agricultural Development Programme, Umuahia, Forestry Research Institute Umuahia, National Cereals Research Institute, Umuahia.

### 3. Sampling Technique

Multi-stage random sampling technique was used to select respondents for the study. In the first stage, two (2) Agricultural zones were randomly selected. These zones were Ohafia and Umuahia agricultural zones Secondly, from each agricultural zones, two (2) blocks were randomly selected to give four (4). These blocks were Ikwuano, Olokoro/Ubakala, Arochukwu and Bende. Thirdly, From the selected blocks, two circles were randomly selected to give a total of eight (8) circles. These circles were Umudike, Amawom, Umuobia, Amakama, Eleoha Umuiwe, Umuezechi and Amaeke. Fourth stage involved random selection of two (2) sub-circles to give sixteen (16) sub-circles. The final stage involved the random selection of six (6) cassava producing households from each village bringing the sample size to ninety-six 96 cassava producing households. However, ninety (90) filled out copies of pretested questionnaire were found usable and were used for analysis.

### 4. Method of Data Collection

Data for this study were collected from primary source. The primary data were collected with pre-tested and well-structured questionnaire administered on the cassava producing households. Data that were collected included the socio-economic characteristics of cassava producing households in the study area; level of commercialization and food expenditure of the cassava producing households in the study area; the determinants of commercialization and food security status of the cassava producing households in the study area and the constraints to commercialization of cassava.

### 5. Data Analyses

The study employed use of both descriptive and inferential statistics to analyse data to be collected. Objectives (i), (iii) and (vi) were realized using descriptive statistics such as frequencies, percentage and mean. Objective (ii) was analysed using Household Commercialization Index (HCI). while food security index was used to analyze objective (iv). Objective (iv)

was achieved using OLS regression model. Objective (v) was realized using simple regression model

## 6. Model Specification

### Level of commercialization

This study employed the household commercialization index (HCI) with modification to determine household specific level of cassava commercialization (Otekunrin et al., 2019; Carletto et al., 2017; Onwusiribe et al., 2021). The index measures the ratio of the gross value of cassava sales by household  $i$  in year  $j$  to the gross value of all cassava produced by the same household in the same year  $j$  expressed as a percentage:

$$HCI = \frac{\text{Total value of cassava marketed}}{\text{Total value of cassava produced}} \times 100$$

Therefore

0 - 0.49 = Not-commercialized

0.50 - 1.0 = Commercialized

### Food security status

Food security index was computed using the expenditure survey approach which is given as:

$$Z_i = \frac{\text{Per capita monthly food expenditure for the } i\text{th household}}{2/3 \text{ mean per capita monthly food expenditure of all households}}$$

Where:

$Z_i$  = food security index.

When  $Z_i \geq 1$ , it implies that  $i$ th household is food secure but

When  $Z_i < 1$ , it implies that the  $i$ th household is food insecure.

## 7. RESULTS AND DISCUSSION

Socio Economic Characteristics of Cassava Producing Households

The distribution of the cassava producing households according to socio-economic characteristics in Abia State, Nigeria is presented in Table 1.

The result in Table 1 indicates that the mean age of the heads of cassava producing household was 35 years. This is expected to impact positively on their productivity and level of commercialization. This implies that majority of the respondents were adults, matured and energetic and should be reasonably enterprising. This represents an active stage in life. The implication of these age bracket according to Okelola et al., (2021) is abundance of young farmers who are energetic to carry out farming operations. This may be because younger farmers are more flexible, have longer planning horizon and tend to have lower risk aversion tendencies than their older counterparts. Moreover, age influences the ability to seek and obtain farming opportunities which will increase their production capacity (Onwusiribe et al., 2021). Also farmers in their prime age of strength and vigour are required to perform many of the cassava farm operations so as to increase their level of productivity and commercialization (Otekunrin et al., 2022).

Table 1 also shows that 93.33% of the smallholders' cassava farmers in Abia State sampled were literate possessing diverse formal educational levels ranging from primary school education to secondary education. The result implies that the cassava farmers in the area were fairly literate having acquired some level of education. Higher educational attainment has been reported to enhance responsiveness, initiative and high level of adoption of improved technologies. This means that they can be convinced to accept better practices and innovation. It is in conformity with Nnadi and Amaechi, (2007) assertion that a greater deal of change had occurred within farmers in recent times due to the introduction of education. High literacy level is an asset, because farmers would be exposed to many information sources, embrace innovations and analyze farm situations objectively. Undoubtedly, the high level of literacy predisposes some level of managerial ability in farming (Nzeakor and Aigbokie, 2021). Education provides a favourable atmosphere for awareness, adoption of innovation and utilization of information (Osondu, 2017).

Table 1 further shows that mean household size of the cassava producing households was 7 persons. The economic implication is that the cassava producing household can provide labour for cassava production and thus, reduce cost of production and increase income. This result lends credence to Obinna et al. (2017) finding of mean household size of 6 persons among farmers in Abia State. This also corroborates the findings of Ayuya, et al. (2011) that large households have the capacity to reduce the labour constraints required during introduction of new technology. Household size is used as proxy for labour availability because individuals in the household are potential source of labour. Their availability reduces labour constraints faced during the peak of the farming season. (Teklewold et al., 2019). According to Abu and Soom (2015) household size has inverse relationship with household food security status because as household size increases there is more number of people to be taken care of by the same source of income. However, this assertion is expected to hold when other members of the household are economic dependents and are not engaged in income generating job/activity.

Meanwhile, a dominant number of the farmers indicated access to credit (75.6%). Lack of access to credit is believed to have significant negative consequences for aggregate and household-level outcomes, such as technology adoption, agricultural productivity, food security, nutrition, health, and overall household welfare (Diagne and Zeller, 2011). Improved access to credit will help poor farmers engage in more productive income-generating activities that will raise their living standards. Access to credit has the capacity to transform the poor through acquiring productive

capital, which improves their capacity to generate income and savings (Diagne and Zeller, 2011, Idu and Sunday 2016).

The result also showed that about (35.6 %) of the respondents had between 1.1 – 2.0 hectares of farm land, 32.2 percent had between 2.1 – 3.0 hectares of farm land, 20.0% of the respondents had between 0.1 -1.0 hectares of farm land, 12.2 percent have between 3.1-4.0 hectares of farm land. The mean farm size is 1.9 hectares. The above situation indicates that there is skewness in the distribution of land in the study area. Greater number have small area usually fragmented holding which supported subsistence agriculture. The result supports the assertion made by Nnadi and Amaechi, (2004), that under inheritance, the whole heirs of every family have their shares of land no matter how fragmented and small their sizes area. This lays credence to the subsistence farming characteristic in the area.

Table 1 shows that the average farming experience for smallholders' cassava farming in the study area is about 10 years. The result suggests that job performance in smallholders' cassava farming in the study area would be better under long years of experience. Nwaru (2004), noted that the number of years a farmer had spent in farming business may give an indication of the practical knowledge he has acquired on how he can overcome certain inherent farming problems. Experience determines his ability to make effective decisions and it is expected to influence farming efficiencies because of accumulation of skills. The implication of this is that they are equipped to overcome their farming challenges to a considerable extent.

#### Level of Commercialization of the Cassava Producing Households

Distribution of the cassava farmers based on level of commercialization and food security status in the study area is presented in Table 2. In measuring the level of commercialization, commercialization index, which is ratio of the gross value of all cassava sales per farmer to the gross value of all production was used in Naira. The result presented in the table shows that the minimum and maximum values of commercialization were 0.336 and 1 respectively. This implies that commercialization ranged from 0.336 to 1 but not greater than 1. Specifically, majority (70.00%) of the cassava farmers had commercialization index between 0.50 – 1 %, categorized as commercialized, while about 30.00% of the cassava farmers have commercialization index less than 0.50%, categorized as not-commercialized farmers.

The result shows a mean commercialization index of 0.646970. This implies that there is a moderate level of orientation of these farmers towards commercialization in the study area. The result in not

in line with Agwu et al. (2012) who obtained 19.06% of sweetpotato commercialized in Abia state but agrees with Govereh et al. (1999) and Onwusiribe et al. (2021) that the closer the index is to 1, the higher the degree of commercialization. The shows that the level of commercialization in the study area was considerably moderate.

### Monthly Food Expenditure

The analysis in the Table 3 provides information on the amount spent on each food items by an average cassava producing household head in Abia State, Nigeria. The table shows the mean monthly food expenditure of the households. From the table above it is observed that the mean expenditure was N23,727.89, while 2/3 per capita monthly food expenditure was 15,818.59. Thus N15,818.59 was adjudged as the food security line. This implies that every individuals requires N15,818.59 or above necessary to maintain a certain level of household living standard given some change in demographic circumstances (typically, the introduction of children) per month.

### Food Security Status

The distribution of the respondents according to food security status is presented in Table 4. From the result obtained in Table 4 above, the respondents were then classified into food secured and insecure households. A food secure household is that whose per capita monthly food expenditure is at least equal to two-third of the mean per capita monthly food expenditure (15,818.59). On the other hand, a food insecure household is that whose per capita monthly food expenditure is less than two-third of the mean per capita monthly food expenditure. The study area could be regarded as food insecure given the fact that per capita monthly food expenditure of greater percentage (65.0%) of the rural households fell below the food security line. Only 35% of the households were food secure.

### Effect of Commercialization on the Food Security Status of Cassava Producing Households.

Result of ordinary least square regression on effect of commercialization on food security status of the cassava producing households in the area is presented in Table 5. The F- ratio was significant at 1% indicating the goodness-of-fit of the model. Specifically, the result indicates that there is a positive relationship between commercialization and food security level in the area. The implication is that increase in level of commercialization increases food security status of the cassava producing households. According to Otchere et al. (2019), household food security status is significantly related positively with household degree of commercialization of cassava output.

Constraints to Commercialization of Cassava among Cassava Producing households.

Constraints to commercialization of cassava

among the cassava producing households is presented in Table 6. Table 6 shows that instability in government policy (86.67%), lack of collateral required to secure loan (72.22%), high cost of cassava stem (54.44%) and bad road network (54.44%) were major constraints to cassava commercialization as they were reported by majority of the respondents. Government policy accounted for 86.67%, at the microeconomic level unfavourable government policy is a major constraints to commercialization. This findings corresponds to Nwibo and Alimba (2013). Also lack of collateral required to secure loan accounted for 72.22%. The implication of this result is decrease in level of commercialization of cassava. High cost of cassava stems (54.44%). The high cost of cassava stem increase expenses on cassava production thus decrease the number of hectares cultivated per season, which will in turn reduce total output and level of commercialization. Bad road network account for 54.44%. This study therefore arose to observe low level of movement of input and output through and fro the farm. The unavailability of rural infrastructure, particularly roads perpetually restrain farmers' incomes and their potency to adopt modern technologies (Banjo et al., 2012). Without an efficient road network, movement of people and agricultural produce are impeded hence stifling agricultural commercialization and economic growth (Hine et al., 2001). Rural transport infrastructure (good road) is crucial for agriculture; agri-business and marketing as well as agro-industries (Anthony et al., 2019) as it affords farmers a conducive environment to Foot, animal and bicycle paths feed into rural roads.

## 8. CONCLUSION AND RECOMMENDATION

Based on the finding of this study, it is concluded that the proportion of food insecure households is more than the food secure households. The study also concluded that a positive relationship exist between commercialization and food security status of cassava producing households. Therefore, the following recommendations suffice.

i. The agricultural policies that promote access of farmers to land and other farm inputs can lead to increased farm household productivity and income. This call for effective implementation of existing land use policy which was intended to enable farmer's access to land in any part of the country for agricultural purposes.

ii. Due to the positive effect of commercialization on food security, proper training of farmers in rural areas by government on the best ways to cultivate and harvest crops is advocated for.

**Table 1: Description of Socio-Economics Characteristics of Cassava Producing Households in Abia State, Nigeria (n=90)**

Age (years)	Frequency	Percentage (%)
20 - 29	24	26.7
30 - 39	35	38.9
40 - 49	24	26.7
40 - 59	7	7.8
Total	90	100.0
<b>Mean</b>	<b>35.3</b>	
<b>Education</b>		
No formal Education	6	6.7
Nursery	1	1.1
Primary	30	33.3
Secondary	53	58.9
Total	90	100.0
<b>Household Size</b>		
1-3	10	11.1
4-6	61	67.8
7-9	17	18.9
10-12	2	2.2
Total	90	100.0
Mean	7.1	
<b>Access to credit</b>		
No	22	24.4
Yes	68	75.6
Total	90	100.0
<b>Farm size (ha)</b>		
0.1-1.0	18	20.0
1.1-2.0	32	35.6
2.1-3.0	29	32.2
3.1-4.0	11	12.2
Total	90	100.0
Mean	1.9	
<b>Experience (years)</b>		
1 - 10	63	70.0
11 - 20	14	15.5
21 - 30	13	14.4
Total	90	100.0
Mean	9.9	

Source: Field Survey, 2022

**Table 2: Commercialization Index of Cassava Farmers in the Study Area**

Commercialization index	Frequency (f)	Percentage (%)	Rank
0 - 0.49	27	30.00	Not-commercialized
0.50 - 1.0	63	70.00	Commercialized
Minimum	0.336		
Maximum	1.00		
Mean	0.646970		
Std. Dev	0.1984673		

Source: Field survey (2022)

Decision rule:  $HCI \geq 0.50$  commercialized,  $HCI < 0.50$  not commercialized

**Table 3: Mean Per Capita Monthly Food Expenditure of Cassava Producing Households**

Items	Mean value	Percentage share
Cereals (maize, rice, sorghum, wheat, bread)	5828.33	24.56
Tubers (sweet potatoes, cassava)	4213.67	17.76
Pulses (beans, peas, groundnuts)	2157.00	9.09
Fruits & vegetables	1054.33	4.44
Fish/Meat/Eggs/poultry	1383.92	5.83
Oil, fat, butter	2214.33	9.33
Milk, cheese, yogurt	1149.76	4.85
Sugar/Salt	1387.79	5.85
Tea/Coffee	1220.75	5.14
Other meals/snacks consumed outside the home	3118.00	13.14
Per capita monthly food expenditure (Naira)	23,727.89	100.00
2/3 Per capita monthly food expenditure (Naira)	15,818.59	

Source: Field survey (2022)

**Table 4: Distribution of the respondents based on food security status**

Food Security status	Frequency	Percentage
Food secured	42	35.0
Food insecure	48	65.0
Total	90	100.0

Source: Field survey, 2022

**Table 5: OLS Result on Effect of Commercialization on Food Security Status**

Variable	Coefficient	t-value	prob
Constant	4.908***	34.057	0.000
Commercialization	3.292E-6**	2.045	0.043
R2	0.34		
Adjusted R2	0.26		
F-ratio	4.183***		

Source: Field survey (2022) \*\*\* Significant at 1%, \*\* Significant at 5%

**Table 6: Constraints to Commercialization of Cassava of Cassava Producing Households**

Constraints	*Frequency	Percentage (%)
High cost of organic and inorganic fertilizer	12	13.33
High cost of cassava stem	49	54.44
High cost of agrochemicals	11	12.22
Unavailability of labour to carry out farming Activities	8	8.89
Very small output	14	15.56
Inadequate information on cassava marketing	15	16.67
Low quality of cassava harvested	9	10.00
Very far market distance	22	24.44
High cost of Transportation	38	42.22
Seasonal price variation	18	20.00
Bad road network	49	54.44
Perishability of the product	9	10.00
Poor storage facilities	11	12.22
Bulkiness of the goods	44	48.89
Poor pricing	31	34.44
Market Remoteness	19	21.11
Pest and diseases	18	20.00
Scarcity of farm land	19	21.11
Instability in government policy	78	86.67
Lack of technical knowledge in the use of land	11	12.22
Lack of collateral required to secure loan	65	72.22
Poor extension agent farmers contact	12	13.33

**Source:** Field survey (2022).

\* Multiple Responses recorded

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