



Analysis of Cassava Farmers' Revenue Who were Innovation Participants in Ogun State, Nigeria: 2016-2018

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Abstract

The net revenue from an activity is obtained by subtracting the cash expenses incurred in production from the gross revenue. Gross revenue is the sum of all receipts from the sale of a crop. This study was carried out in Ogun State, Nigeria (latitude 7° 00'N and longitude 3° 35'E) to analyse the revenue of cassava farmers who were involved in improved practices. The simple Random Sampling technique was adopted in the selection of 336 farmers from the study area. Data were analysed using frequency counts, percentages, budgetary technique as well as Chow test. Results showed that there was a steady increase in the revenue until it reached the peak. Thereafter, it fell below the zero lines into the negative. Also, all (100.0%) of the participants had formal education and belonged to a farmers' association. The average farm size was 1.64 hectares. The study, therefore, recommends regulation of cassava price so that it will not fall below a certain fixed point. It also recommends the government purchase of excess cassava output directly from farmers in order to avoid a market glut. Finally, value addition should be promoted to boost income derivable from cassava sales.

Keywords: Revenue; Production; Sales; Participants; Association.

1. Introduction

The net income from an activity is obtained by subtracting the cash expenses incurred in production from the gross income. Gross income is the sum of all receipts from the sale of a crops, as well as all forms of direct payments from government. Income and wealth are only partial indicators of wellbeing. In industrialized nations, other measures include the ability to control one's own environment, quality of working conditions, independence among others. In developing countries, measures of welfare include the fundamental issue of life expectancy, food security and health.

Two of the most obvious income measures are total income and disposable income. Total income refers to the composition of resources flowing towards a household from their engagement in agriculture and from a range of other sources and how these sources differ over time, place and among different households. These comprise income in money terms (profits, cash wages, interest received, and social benefits) and in kind. Disposable income has a more direct relationship to economic welfare as it relates to command in the market over goods and services.

Farmers may receive income from many sources but the most common source is the sale of crops, livestock and other produce raised or bought for resale. The entire amount a farmer receives including money and the fair market value of property or service minus farm expenses constitute profit or loss from the farm. Another source of farm income is bartering income which occurs when farm products are traded for other farm goods and services. For instance, a farmer helps build a barn for another and receives a goat for his service, or another farmer exchanges a basket of mangoes for some tubers of yam among others. Other sources of farm income include cooperative distributions, agricultural programme payments, commodity credit loans, crop insurance proceeds and federal disaster payments and custom (machine hire) income. Farm expenses include amounts paid for farm labour, purchase of farm inputs, depreciation on farm property such as buildings, machinery, equipment and others.

1.1. Objectives of the Study

The broad objective of the study was to analyse the revenue of cassava farmers who participated in innovations in Ogun State, Nigeria from 2016 to 2018.

The specific objectives are to:

- i. Analyse the revenue of the participants and non-participant of the innovation;
- ii. Determine the profit made by the participants.

1.2. Hypothesis of the Study

There is no significant difference between the revenue of participants and non-participants

2. Methodology

2.1. Study Area

This study was conducted in Ogun State (latitude 7° 00'N and longitude 3° 35'E), Nigeria. It is located in the southwest zone of the country with the total land area of 16, 409.26 square kilometres. It is bounded on the West by Benin Republic on the south by Lagos and the Atlantic Ocean, on the East by Ondo State and on the North by Oyo and Osun States. Ogun State indigene belongs to Yoruba ethnic group comprising mainly the *Egba, Yewa, Awori, Egun, Ijebu and Remo*. Farming is the dominant economic activity of the people of Ogun state.

The two dominant religions in the state are Christianity and Islam. A small proportion of the people still practice traditional religion. The people of Ogun state engage in one form of economic activity or another as a means of livelihood. These include trading, farming, tie and dye production, civil service, pottery and other professional and technical occupation. Farming is the dominant economic activity of the people of Ogun state. They engage in both crop and livestock production.

The ecological climate of the state falls within the rainforest zone and partly within the southern Guinea Savannah zone. The mean annual rainfall distribution in the state is about 1300 mm. The annual rainfall varies over the years. The average temperature is 28°C and relative humidity of about 78%. The relative humidity remains uniform. The northern part of the state is mainly of derived savannah vegetation while the central part falls in the rain forest belt and the southern part belong in mangrove swamp. The geological landscape of the state comprises extensive fertile soil suitable for animal husbandry especially cattle rearing. The north-western part of the state tends toward savannah vegetation and so suitable for cattle rearing. There are also forest reserve, rivers, lagoon, rocks, mineral deposits such as granite, limestone, kaolin, bitumen, phosphate and others. The state is blessed with respectable climate that supports cultivation of variety of crops such as yam, cassava, maize, plantain, vegetable and fruits. The main cash crops produced in the state are cocoa, cashew, kola nut, oil palm, rubber and coffee. The state is known to have various Agricultural Extension Programme implemented in four agricultural zones identified by OGADEP as Abeokuta, Ilaro, Ijebu and Ikenne. Each zone comprises of block, each block is divided into circle or cells and farmers within these areas are anchored by a Village Extension Agent (VEA) who oversees their activities. The Block Extension Agent (BEA) oversees the activities of farmers in the coverage area (www.ogunstate.gov.ng).

2.2. Population, Sampling Frame and Sample Size

The target population of the study were the cassava growers in the 14 LGAs, who made up the participants and non-participants of the innovations in Ogun State. The sampling frame for the participants was obtained from Ogun State Agricultural Development Programme (OGADEP) office. There were 43 Extension Agents, who taught the farmers and 8,600 participants spread across the 14 participating LGAs as shown in [Table 1](#).

2.3. Sampling Procedure and Sample Size

Stage I: Out of the 20 LGAs in Ogun State, the 14 participating LGAs were selected namely; Ewekoro, Ijebu Ode, Ijebu North-East, Shagamu, Obafemi Owode, Ado Odo, Ogun Waterside, Ikenne, Odeda, Ipokia, Yewa North, Yewa South, Ifo and Odogbolu.

Stage II: Using [Watson \[1\]](#) sampling technique at confidence level of 95% with estimated 10% variance in population (degree of variability), a random sampling was carried out to select 168 participants for the study in a proportionate manner across the participating LGAs.

Stage III: To select for the control group, a random sampling of equal number of non-participants were selected from the same participating LGAs. A total of 168 non-participants were also selected across the LGAs. The selection was done by the researcher in collaboration with OGADEP extension agents. The total sample size for both the participants and non-participants was 336.

Table-1. Sampling Frame and Sample Size

	LGAs	Extension Agents	Sampling Frame	Sample size
1	Odeda	9	1800	13
2	Ifo	2	400	11
3	Ewekoro	3	600	12
4	Ado Odo	3	600	13
5	Shagamu	1	200	11
6	Obafemi Owode	4	800	13
7	Ikenne	3	600	13
8	Odogbolu	1	200	11
9	Ijebu North East	2	400	11
10	Ijebu Ode	5	1000	13
11	Ogun Waterside	2	400	11
12	Yewa North	4	800	13
13	Yewa South	2	400	11
14	Ipokia	2	400	11
	Total	43	8600	168

Source: OGADEP, 2017

2.4. Data Analysis

Data obtained were subjected to descriptive and budgetary technique using the Statistical Package for Social Sciences (SPSS 20.0) and STATA 14 version. Results were presented in chart, frequencies, percentages, mean (\bar{x}), Standard Deviation (SD) and Naira. Chow test result was presented in the differential between the computed F and F-critical value.

3. Result

[Table 2](#) shows that the average and the maximum land area used for cassava production in the study area was 1.6 ha and 3 ha, respectively. Also, the average age of the farmers was 44 years and they all (100%) belonged to a registered cooperative society. Also, most (64.9%) of them were men and majority (95.8%) were married. Furthermore, many (48.2%) of them had tertiary education and secondary education (40.5%).

Table-2. Distribution of Respondents According to Socioeconomic Characteristics (n=168)

Characteristics	Frequency	Percentage (%)	Mean
Age (years)			
≤ 40	76	45.2	
41-56	70	41.7	
≥ 57	22	13.1	43.7±0.69
Sex			
Male	109	64.9	
Female	59	35.1	
Marital status			
Married	161	95.8	
Single	7	4.2	
Household size			
≤5	133	79.2	
6-10	33	19.2	
≥ 11	2	1.2	4.5±0.44
Education			
Primary school	19	11.3	
Secondary school	68	40.5	
Tertiary	81	48.2	
Farm size (ha)			
≤1	78	45.1	
1.1-2	66	38.16	
≥2	29	16.76	1.6±0.78

Years of participation in GIZ			
1	2	0.6	
2	1	1.2	
3	101	60.1	
4	64	38.1	3.4±0.76
Association membership			
Membership	168	100	

Source: Field survey data analysis, 2018

Table 3 reveals that majority (87.5%) of the respondents earned ₦250,001 - ₦400,000 for 2016, while 6% earned greater than or equal to four hundred thousand and one naira (\geq ₦400,001). The average revenue for the year was ₦336,880.10. Also, the Table shows the revenue earned by the farmers in 2017. Many (55.4%) of the farmers earned ₦250,001 - ₦400,000, while the remaining 44.6% earned \geq ₦400,001. The average revenue for the year was ₦415,333.33. Further revealed in the Table is the revenue for 2018. Majority (91.1%) of the respondents earned less than or equal to \leq ₦250,000, while the remaining minority group (8.9%) earned ₦250,001 to ₦400,000. The average revenue for the year was ₦96,446.45.

As depicted in the Table, there was increase in average revenue from ₦336,880.95 in 2016 to ₦415,333.33 in 2017. The sum of revenue for 2016-2018 reveals that majority (81.9%) of the respondents earned ₦500,001 - ₦1,000,000, while 17.0% earned \geq ₦1,000,001. The average revenue for the sum of the years was ₦848,660.71.

Table-3. Revenue of Participants (n=168)

Variables (₦)	Freq	Percentage	Mean
Revenue 2016			
\leq 250,000	11	6.5	
250,001-400,000	147	87.5	
\geq 400,001	10	6.0	336,880.95±233,827.953
2017 Revenue			
\leq 250,000	0	0	
250,001-400,000	93	55.4	
\geq 400,001	75	44.6	415,333.33±74,287.729
2018 Revenue			
\leq 250,000	153	91.1	
250,001-400,000	15	8.9	
\geq 400,001	0	0	96,446.43±87,182.36
Gross mean			282,660.71±131,766.01

Source: Field survey data analysis, 2018

Table 4 shows that the NFI (₦254,433.33) for 2017 was the highest. However, in 2018 the farmers experienced a loss. The NFI for the year was ₦-64,453.57.

Table-4. Cost and Return Analysis

Variables	2016	2017	2018	Total
AFC (₦)	10,000	10,000	10,000	30,000
AVC (₦)	140,900	140,900	140,900	422,700
GM (₦)	203,338.10	264,433.33	-54,453.57	395,960.71
NFI (₦)	193,338.10	254,433.33	-64,453.57	365,960.71

Profit made by the farmers

$$GM = AR - AVC \quad (1)$$

$$NFI = GM - AFC \quad (2)$$

Where:

GM= Gross Margin

AR= Average Revenue

AVC= Average Variable Cost

NFI= Net Farm Income

AFC= Average Fixed Cost

AR= Different value for each year

AVC= ₦140,900.00

AFC= ₦10,000.00

GM = AR - AVC

As represented in Figure 1, there was steady increase in the NFI from 2016 until it reached the peak in 2017. Thereafter, it began to fall gradually until it fell below the zero line into the negative region of the graph. This compares favourably with the law of diminishing returns.

Figure-1. Net Revenue of Participants

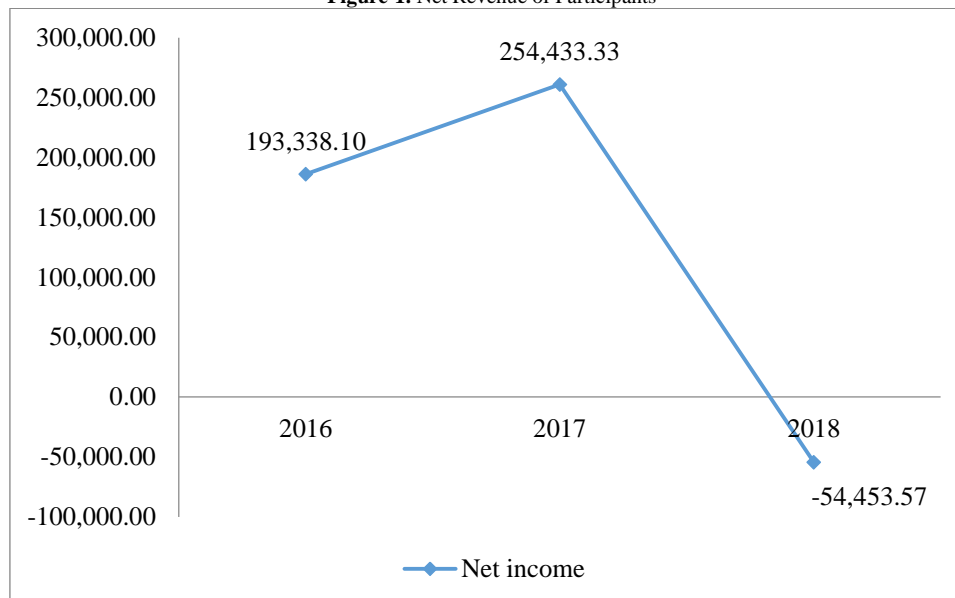


Table 5 shows the result of the hypothesis. There was a significant difference between the participants and non-participants' revenue. Computed Chow F (608.84) was greater than table value (3.00) at 2 degrees of freedom numerator and 332 degrees of freedom denominator, and at 5% level of significance.

Table-5. Difference between the Revenue of Participants and Non-Participants (n=336)

RSS	RSS1	RSS2	F-chow	F-critical @5%	Decision
3.5621e+14	5.4231e+13	2.7806e+11	608.84	3.00	Significant

4. Discussion

The average and the maximum land area used for cassava production being 1.6 ha and 3 ha, respectively implies that the farmers were smallholders. That the average age of the farmers was 44 years implies that they were young and in their active age with the required energy for cassava farming. Membership in a registered cooperative society enables the farmers to pull resources together, compares ideas and achieve result which might be difficult to achieve alone. Cassava farming is laborious hence, the higher percentage of men than women in the study area. Furthermore, many of the farmers had tertiary and secondary education which prepared them to accept innovation. The educational background of the farmers plays a vital roles in their production and technology adoption. Generally, education is thought to create a favourable mental attitude for the acceptance of new practices especially information-intensive and management-intensive practices [2]. Education reduces the amount of complexity perceived in a technology thereby increasing a technology's adoption. [Nsikakabasi and Ukoha \[3\]](#) also observed that educated farmers are better adopters of agricultural innovations and tend to have higher yields and incomes from cultivated areas.

The average revenue among the participants for 2017 was ₦415,333.33. It implies that cassava farmers in the study area could live competitively with their civil servant counterparts in the state. The minimum wage for the civil servant was ₦18,000 per month. This means that cassava production is a profitable venture. This made valid the report of [Ani, et al. \[4\]](#), who stated that cassava production is a profitable venture when properly managed. It also supports the finding of [UN COMTRADE \[5\]](#), which reported that in Thailand cassava increasing yields over the past two decades have boosted small-holder earnings by an estimated US\$650 million and lifted many cassava growers out of poverty. It further buttressed [IITA \[6\]](#), whose report showed that mechanized (an improved) method of cassava production is very profitable and cost effective. It also corroborates the finding of [GrowAfrica \[7\]](#), who reported that investments in cassava research and development in Africa could generate some of the highest gains in agricultural GDP. Also, [Prakash \[8\]](#) and [Obinna \[9\]](#) posited that cassava generates about 25% of cash income from all crops grown, constituting the most important single source of cash income. Furthermore, [Obinna \[9\]](#) and [Otekunrin and Sawicka \[10\]](#) reported that the prospects for enhanced foreign exchange earnings from cassava exports is becoming significantly high following recent interest of foreign nations to buy cassava products from Nigeria.

There was increase in average revenue between 2016 and 2017. This was because the farmers readily supplied more cassava to the market in response to the favourable market price. The increase in revenue experienced in 2017 might be as a result of favourable government policy which encourage cassava production. There was ready market for farmers' output at a favourable price.

The high profit experienced by the farmers in 2017 could be traced to the favourable selling price of cassava and availability of buyers who were willing to pay for farmers' output. It could also be as a result government policy that favoured cassava production. The market equilibrium price was reached in this year. This means the farmers

were willing to sell their cassava output and the buyers were also willing to pay for whatever the farmers supplied at that prevailing market price.

However, in 2018 the farmers NFI was ₦64,453.57. The shortfall experienced by the cassava farmers during this year was due to unfavourable market price. The market price fell below the equilibrium price and the farmers responded by reducing cassava supply to the market. This strategy is meant to create artificial scarcity in order to force up the market price. It could be that there was mass participation in cassava production by both the participants and non-participants as a result of windfall experienced by the farmers in 2017. This caused market glut and consequently forced cassava price down below the market equilibrium price.

Table 3 shows the difference between participating and non-participating farmers in innovations. The computed F-Chow was greater than table value. It implies that there is a significant difference between participants and non-participants' income. Therefore, the null hypothesis was rejected. The innovations were, therefore, adduced as beneficial and enhanced farmers' revenue. This is in tandem with the findings of Atagher, *et al.* [11], who reported significant difference in the output of beneficiaries (₦16,523.87) and non-beneficiaries (₦3,777.56) of ADP in Benue State, Nigeria.

5. Conclusion and Recommendation

The study concludes that the revenue of cassava farmers who participated in the innovation advised by the extension agents was better than that of the non-participants. It further concludes that the prevailing market price is the determinant of the farmers' revenue. The revenue fluctuates with market price. It rose steadily, reached the peak and fell, following the cobweb theorem. The study, therefore, recommends that government in collaboration with relevant bodies should ensure market price regulation in favour of cassava farmers. Also, government should purchase the excess cassava production in order to avoid market glut. Furthermore, cottage industries should be established in the cassava producing communities to promote value addition. This will in turn raise the farmers' revenue derivable from cassava production. It finally recommends farmers-friendly policies by the government for increased revenue generation in the State.

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