



COMPARATIVE ASSESSMENT OF *GARI* AND *FUFU* MARKETING IN UMUAHIA NORTH LOCAL GOVERNMENT AREA OF ABIA STATE, NIGERIA

¹Uzuegbu, J.O., ²Onu, D.O. and ¹Okoye, B.C.

¹National Root Crops Research Institute, Umudike, PMB 7006, Umuahia, Abia State, Nigeria

²Department of Agricultural Economics, Michael Okpara University of Agriculture, Umudike, PMB 7267, Umuahia, Abia State, Nigeria

Corresponding Authors' email: ouzuegbujanet@gmail.com

Abstract

The study comparatively assessed the marketing of *gari* and *fufu* in Umuahia North Local Government Area (LGA) of Abia State. Purposive sampling technique was used to select 120 processors/marketers used for the study. Descriptive statistics, net return and multiple regression technique were employed to analyze the data collected. Results of analysis showed that majority of *gari* (73.33%) and *fufu* marketers (93.33%) were females. Majority of the respondents were married middle aged marketers, with moderate household sizes, had formal education, and average marketing experience of 22.12years and 21.99years respectively. The marketers sourced their cassava tubers from the farm gate, wholesalers, retailers and owned farm. The result further indicates that processing cassava tubers into *gari* was more rewarding since the return to investment was higher for *gari* compared to *fufu*. There was significant difference between profitability of *gari* and *fufu* marketers in the study area. The coefficients of household size, storage cost and transportation cost were negatively related to profitability of *gari* marketing and significant at 5%, 1% and 10% levels respectively, and marketing experience and price of *gari* which were positive and significant at 1% and 5% level respectively. The coefficients of household size, price of *fufu*, and education were directly related to profitability of *fufu* marketing, and significant at 1%, 5% and 10% level respectively, as well as transportation cost and handling cost which were negative and significant at 10% level each. The study recommends that the marketers should be encouraged to form cooperatives association to help reduce cost of marketing while taking advantage of economies of scale. Policy on price control mechanisms is advocated to mitigate price volatility for enhanced profit. Trainings, workshops and seminars should be organized for the marketers to update their basic skills in cassava by-products marketing.

Keywords: Profitability, marketing efficiency, price of *fufu/gari*, and transportation cost

Introduction

Cassava is a basic food staple contributing about 40% of the food calories consumed in Africa (IITA, 2004). It is the third largest source of food carbohydrates in the tropics, after rice and maize (Emokaro and Erhobo, 2006). Two major and most popular forms in which cassava is processed and marketed in Abia State are *gari* and *fufu*. *Gari* can be described as a fermented and roasted granular product from cassava. Several studies have established the high acceptability and consumption of *gari* both in rural and urban communities in Nigeria (Nweke *et al.*, 2004). Chukwuji *et al.*, (2007) and Farinde and Ajayi, (2007) noted that the problem of spoilage and bulkiness of cassava root could be overcome through processing. Onya *et al.* (2016) emphasized that value chain improvement is imperative to sustain cassava sector as it will help to strengthen the links between supply and demand.

Furthermore, Chukwuji *et al.*, (2007) indicated that processing of cassava root increases its shelf-life in storage and adding value leads to an increase in marketing margin of the processors. Marketing is the movement of goods and services from the point of production to the point of consumption by the ultimate consumers, and agricultural development cannot occur without improved marketing. This is because agricultural marketing is concerned with all the economic activities involved in the production and distribution of agricultural products. (Nwosu *et al.*, 2012).

Cassava is Africa's second most important food staple in terms of per capita calories consumed. It is a major source of calorie for roughly two out of every five Africans. In some countries cassava is consumed daily and sometimes more than once a day. Cassava has the

potential to increase farm incomes, reduce rural and urban poverty and help close the food gap. Cassava holds great promise for feeding Africa's growing population. In recent times, cassava is progressively gaining a strategic position in the global trade as a result of the efforts by various research and development stakeholders in developing value-added cassava-based products such as the white and light oil gari for human consumption and industrial uses (Onyeka *et al.*, 2014). The emerging trend of cassava as a dual purpose crop among the Nigerian small-scale farmers as a food security crop and as a cash crop has become a very topical issue in Nigeria in recent times, which brought about "The Presidential Initiative on Cassava" in 2002. Studies by Nweke (2004) and Okoye (2010), have shown that cassava products generates about 25 % of cash income from all food crops grown among the farming households mostly, in Nigeria.

Major products derived from cassava are fufu and gari, others are flour (alibo), starch, tapioca, sliced cassava chips (abacha), and ethanol cassava-based products. For cassava product to be market driven, value must be added to it, through conversion to other by-products, such as white and light yellow gari, that are more stable, safer and available products which are also market preferred (Onyeka *et al.*, 2014). Nweke (2004) observed that cassava is widely accepted as food in various forms and its demand is highly elastic due to its multiple roles. Similarly, Ndirika (2011) observed that farmers in Nigeria have been exposed to an array of capacity building on agronomic and value addition practices by the Extension Agents. It was in line with this, that Ndirika (*ibid*) stated that rural farmers are increasingly being enlightened on the importance of adopting cassava value added innovations as part of the transformation agenda of Agriculture in Nigeria, which is aimed at enhancing the quality of cassava by-products and at the same time increase the income level of the rural farmers.

One of the major and most important products of cassava is Gari. Gari is a fermented, gritty and starchy food or free flowing dry granular product of processed cassava roots. It is processed by fermenting, peeled and grated roots followed by dewatering, sieving and toasting or frying. It is consumed principally as a main meal (*eba*) or taken as a snack when soaked in cold water, sweetened with sugar and consumed with roasted groundnut, coconut and sometimes dry fish. Gari features more frequently up to 2 or 3 times in the daily diet of most households in the producing areas (NRCRI, 2008). Another product from cassava is fufu, it is a fermented wet paste widely consumed in eastern and southwestern Nigeria. Fufu is the second major product consumed by households and ranked next to gari in importance. A report by Phillip *et al.* (2004) indicated that cassava (gari) is truly a national food with an urban market presence. Cassava product (gari and fufu) appears to be a 'food of choice' even in the face of alternative food options (Nweke *et al.*, 2004). In the light of this, it is therefore necessary to do a comparative

analysis of gari and fufu marketing in Umuahia North, Abia State, Nigeria.

Efficient marketing has a dynamic role to play in stimulating output and consumption which are essential for economic development of any nation, and widely consumed product in the world (FAO, 2012). The level of efficiency in the marketing system is a measure of market performance. Marketing systems play a decisive role in vibrant economies as mechanisms for exchange (necessary for specialization and hence leads to higher economic growth) functions and the proper coordination of the exchange (through price signals), which reflect and shape producer and consumer incentives in supply and demand interaction. If small scale domestic producers are to take advantage of the projected domestic demand growth, then marketing systems in the supply chains linking producers, processor to the final consumers must be able to support low cost production and timely delivery of the products (Ezedinma, 2005).

Despite the increased demand for gari and fufu as staple food mainly consumed in Abia State in particular, and Nigeria in general, lack of market information, poor market structure, which leads to price instability, poor road network, high cost of transportation, and the likes affect marketing of Gari and fufu. Participants in the marketing system may have to travel long distances in order to buy or sell their product, a situation, which at times create gaps between supply and demand and possible hikes in product prices. More so, there is little or no interest on the part of government and individual investors or manufacturers on the selected cassava products. This is because most investors and government have vague idea of industrial potential, and therefore, slow in committing investment funds into this subsector (Nwakor, 2012). The study therefore, sought to: identify the respondents' sources of fresh cassava roots for processing and marketing, estimate and compare the level of profit generated from marketing of gari and fufu, estimate the marketing efficiency of gari and fufu marketers; and factors affecting the profitability of gari and fufu marketing in the study area.'

Methodology

The study was carried out in Umuahia North Local Government (LGA) of Abia State. It is one of the 17 LGAs in Abia State created by the government of Ibrahim Babangida in August, 1991 and currently, its headquarters is in the city of Umuahia (Capital of Abia State). Umuahia North is located within the tropical rain forest ecological zone of Nigeria. It occupies a land mass of 14.464 square kilometers and has geographical coordinates of 5° 32' North, and 7°29' East, and according to 2006 National Population Census, it has a

total population of 359,230, but with a growth rate of +2.74%/year (NPC 2006). The soil type is predominantly sandy loam with some swamp areas, especially along the river banks. These support the growing of such staple food crops as cassava, yam, maize, potatoes and vegetables, with mixed cropping predominantly practiced.

Sampling Technique

A purposive sampling technique was used to select three major markets in Umuahia North LGA, namely: Ubani, Orie-Ugba and Isi-Gate due to the pre-dominance of gari and fufu marketers in these markets. Thereafter, forty (40) marketers (comprising of 20 gari and 20 fufu marketers) were conveniently sampled from each of the markets, giving a total of 120 marketers (60 marketers for gari and fufu each)

Data Collection

The study made use of primary data. These were collected with the use of structured questionnaire administered to the marketers in the study area. Data collected included the socio economic characteristics, cost, returns and level of profit generated from marketing of gari and fufu among others.

Data Analysis

Different analytical tools were used to analyze various objectives of the study. Descriptive statistics like frequency, mean and percentage, were used to analyze the socioeconomic characteristics of the respondents and identify the respondents' sources of fresh cassava roots for processing and marketing. Profit generated from marketing of gari and fufu was realized using budgetary analysis, Z-test was used to compare the profit levels of the two enterprises. Estimation of marketing efficiency and factors affecting the profitability of gari and fufu marketing were realized using marketing efficiency index and multiple regression respectively.

Model specification

Net Return

$$NR = TR - TC \dots\dots\dots (1)$$

$$TR = PQ$$

$$TC = TVC + TFC$$

Where,

NR = Net Return,

TVC = Total Variable Cost

TFC = Total Fixed Cost

TC = Total Cost

Q = Quantity of gari/fufu sold

P = selling price gari/fufu

Z-Test

$$Z_{cal} = \frac{X_1 - X_2}{\sqrt{\frac{S^2X_1}{n_1} + \frac{S^2X_2}{n_2}}} \dots\dots\dots (2)$$

Where,

X_{ij} = mean net return of gari marketers (measured in Naira)

X_j = mean net return of fufu marketers (measured in Naira)

S^2X_i = variance of net return of gari marketers measured in Naira

S^2X_j = variance of net return of fufu marketers measured in Naira

n_i = number of gari marketers

n_j = number of fufu marketers.

Marketing margin (mm) is given as;

$$MM = \frac{\text{Selling price} - \text{Purchase price}}{\text{Selling price}} = \frac{100}{1} \dots\dots\dots (3)$$

Marketing Efficiency (M.E.) is given as;

$$M.E. = \frac{\text{Net return}}{\text{Total marketing cost}} \times 100 \dots\dots\dots (4)$$

For factors influencing the profitability of gari/fufu, Ordinary Least Square (OLS) regression technique is given for gari and fufu each as;

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8) + e \dots\dots\dots (5)$$

Where,

Y_1 = Net returns for gari/fufu Marketers (Naira)

X_1 = Age (years)

X_2 = Household size (number)

X_3 = Education (year)

X_4 = Marketing experience (years)

X_5 = Handling cost (Naira)

X_6 = Storage cost (naira)

X_7 = price of gari/fufu (Naira)

X_8 = Transportation cost (naira)

e = error term

Results and Discussion

Socio economic characteristics of gari and fufu marketers

Some selected socio-economic characteristics of the gari and fufu marketers are presented in Table 1.

Table 1: Socioeconomic Characteristics of the Marketers

	Gari marketers		Fufu marketers	
	Frequency	Percentage	Frequency	Percentage
Gender				
Male	16	26.67	4	6.67
Female	44	73.33	56	93.33
Age				
21 –30	8	13.33	10	16.67
31 –40	10	16.67	22	36.67
41 –50	22	36.67	16	26.66
>50	20	33.33	12	20.00
Mean	42.59		41.19	
Household size				
1 –2	2	3.33	4	6.67
3 –4	4	6.66	4	6.67
5 –6	12	20.00	16	26.67
7 – 8	16	26.67	18	30.00
> 8	26	43.33	18	30.00
Mean	6		5	
Years of experience				
1 –10	10	16.67	14	23.23
11 –20	20	33.33	16	26.67
21 –30	20	33.33	18	30.00
31 –40	8	13.33	8	13.33
>40	2	3.33	4	6.67
Mean	22.12		21.99	
Educational attainment				
No formal Education	18	30.0	20	33.33
Primary school	16	26.67	20	33.33
Secondary school	14	23.33	12	20.00
Tertiary	12	20.00	8	13.33

Source: Filed Survey Data, 2019

Result shows that majority of the gari (73.33%) and fufu (93.33%) marketers were females, while 26.67% and 6.67% were males respectively. This showed that cassava derivative marketing enterprise is dominated by the females. This is also in line with Offor *et al.* (2017) and Nwauwa (2011), who reported that women feature prominently in marketing, especially in rural markets, while men constitute less than 5% of the traders. This is also in consonance with the report from FAO (2001) that women were more involved in off-farm activities than men, especially transportation of farm produce, processing and marketing of farm produce, feeding of family members, post-harvest operations and reproductive functions. Age distribution shows that many of the gari marketers (36.67%) were within the age range of 41 -50 years, while those of fufu marketers (36.67%) were within the age range of 31-40 years. The greater percentage of both the gari and fufu marketers (73.34%) were within the ages of 31-50 years. The mean age of the gari marketers was 42.59 years, while that of fufu marketers was 41.19 years. By implication, most of the marketers

were within the middle age group, energetic, productive and rational decision makers within the community (Ogundere, 2007). This age indicates that the marketers were middle-aged farmers who according to Onyenweaku and Mbuba (1991), are at their productive age in life and are likely to adopt innovations faster. This is true because age, as a proxy for experience, can enhance business initiatives and efficient use of scarce resources. Nwaru (2004), Ndukwu *et al.* (2010) and Dimelu *et al.* (2009), also found out that the ability of a farmer to bear risk, be innovative and be able to do manual work decreased with age. The distribution of household size shows that majority of the gari marketers had more than 8 persons per household, while majority of fufu marketers had between 7 and 8 persons. It is interesting to note that the greater percentage of the gari (70.00%) and fufu (60.00%) marketers had household size greater than 6 persons. The mean household size for gari marketers was about 6 persons, while that of the fufu was 5 persons. The composition of the household plays a crucial role in agricultural marketing. In Nigeria, a

large household (achieved through polygamy or the extended family) is a livelihood strategy that is adopted to ensure that sufficient labour is available to cover peak workloads (Bishop-Sambrook, 2005). This also has implications on labour supply for gari and fufu marketing. This is consistent with the findings of Iheke and Ukaegbu (2015). According to Iheke (2010), large household size is desirable and of great importance in farm production and marketing, as rural households rely more on members of their households than hired workers for labour on their farms. On the other hand, majority of the gari and fufu marketers had between 2-30 years marketing experience. This is a clear indication that both marketers are experienced, and that could improve marketing in the study area. The mean years of marketing experience for gari marketers was 22.12 years, while fufu marketers was 21.99 years. Marketing experience is very important as it provides the seller with efficient market information. These marketers need information about the business cycle, where and when to buy the product, when to store the product and an appropriate time to sell. This follows the findings of Abbott and Makeham (1990), who observed that marketing experience is important

in determining the profit levels of marketers, the more the experience; the more they understand the marketing system, condition, and trends of the products under marketing. On literacy status, the distribution is skewed in favour of those who had one form of formal education or the other. In other words, greater percentage of the gari (70.00%) and fufu (66.67%) marketers were literate. The literacy status of the marketers was encouraging and this facilitates access and utilization of modern marketing techniques. This is possible because Anthony (2008) stated that education does not only create a favorable mental atmosphere for the acceptance of new ideas but positively changes the overall attitude of the individual towards change. The author further added that education has been known as a powerful instrument that helps to shape life and make the essence of living meaningful even at adult stage. Imonikhe (2010) also added that education enhances marketers' ability to make accurate and meaningful management decisions.

Source of Cassava Roots

The source of fresh cassava roots is a key determinant of the quality and sustainability of the processing/marketing activities. The various sources

Table 2: Distribution of respondents according to the sources of cassava tubers

	Farm gate		Wholesalers		Retailers		Owned farm		Total	
		%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Gari	20	33.33	12	20.00	8	13.33	20	33.33	60	50.00
Fufu	16	26.67	6	10.00	6	10.00	32	53.33	60	50.00
Total	36	30.00	18	15.00	14	11.67	52	38.3	120	100

Source: Field Survey Data, 2019

Cassava processors in the study area obtained their cassava roots from four main sources. These are farm gate, wholesalers, retailers and processors' own farm. Result shows that about 30.00% of the respondents source their roots for processing into gari and fufu from the farm gate, while about 15.00% source from wholesalers. About 11.67% source from retailers, while 43.33% source from their own farms. Also, about 33.33% of respondents who processed cassava into gari sourced roots from the farm gate, while 20.00%, 13.33% and 33.33% sourced from wholesalers, retailers and own farm respectively. For those who processed into fufu, about 26.67% sourced from the farmgate, while 20.00%, 13.33% and 33.33% sourced from wholesalers, retailers and own farms respectively.

Cost, Returns and Profit of selected Cassava Products Marketing

The cost, returns and profit levels of gari and fufu marketing are presented in Table 3. The items associated with the variable cost of the enterprise include: cost of fresh roots, cost of transportation, cost of labour and other marketing costs. Total fixed costs are associated with frying pans, sieves, machetes, sack bags, knives, basins, wooden staves and frying spoons. The straight line method was used in calculating the depreciated values of the equipment used.

Table 3: Average monthly costs, returns and profit of cassava products marketing

Gari Marketing			Fufu Marketing			
Items	Average unit price((Naira)	Quantity	Total Value (₦)	Average unit price(₦)	Quantity	Total Value (₦)
A. Returns From Sales						
Gari	100	250kg	25,000	450	49kg	22,050
Variable Costs						
Cassava tubers	60	250kg	15,000	306.12	49kg	15,000
Labour cost		1 manday	1,200	1,500	1.5 mandays	1,800
Transportation cost			500			500
Cost of market space			1,050			1,050
Cost of storage facilities			800			800
Other marketing costs			400			300
B. Total Variable Cost			18,950			19,350
Fixed Cost						
Depreciation on fixed asset (wheel barrow, sack etc)			1,020			1,020
C. Total Fixed Cost			1,020			1,020
D. Total Cost			19,970			20,470
E. Net income = (A-D)			5030			1580
F. Gross Margin (A-B)			6050			2600
G. Return of Investment(ROI)= (E/D)			0.25			0.08

Source: Field survey Data, 2019

The result shows that 250kg of gari is about N 15,000 at an average price of N100per kg. The labour cost and the depreciation of the equipment used was N1, 200 and N1,020 respectively, giving a total marketing cost of N19,970. The total revenue was N25,000, with a gross margin of N6,050, and net margin of N5,030. For fufu marketing, N15,000 (49kg) worth of fufu were bought at an average price of N306.12 per kg, with the labour cost of N1,800 and depreciation on equipment used as N1,020. The total marketing cost incurred by the processors/marketers was N20,470, with total revenue of N20,050, gross margin of N2,600, and net income of N1,580. The study revealed that the rate of returns to investment which shows that cassava products marketing is an income earning venture. The return per

naira of investment gave 25k for gari, and 8k for fufu. This implied that for every N1 invested in gari and fufu, the sum of 25k and 8k were earned respectively. The result further indicates that gari marketing is more rewarding since the return to investment is higher compared to fufu.

Test of Significant Difference in Profitability of Gari and Fufu Marketing

The result of the test of significant difference in profit is presented in Table 4. Significant level of 0.001 which is less than (α) = 0.05 was estimated. The Z-calculated of 1.961 is greater than the z-critical of 0.840. Since the z-calculated is greater than Z-tabulated, we conclude that there is a significant difference between the profitability of gari and fufu marketing in the study area

Table 4: Summary of Z-test analysis of significant difference between profitability of gari and fufu marketing

Samples	Mean	Std. Dev.	Std. Error	Df	Z-cal	Z-tab	Prob	Decision
profit of gari marketers	5030	0.59822	0.30427	118	1.961	0.840	0.001	Significant
profit of fufu marketers	1580	0.22613	0.12581					Accepted
^a Paired difference	3450							

Marketing Margin and Marketing Efficiency of gari and Fufu Marketing

The marketing margin and marketing efficiency of gari and fufu marketing are presented in Table 5. The result shows that the average marketing margin for the gari marketers, which was used as proxy for profitability, was estimated to be N5,030 per 50kg bag, while that of fufu was N1,580 per 49kg. Thus, gari and fufu marketing is a relatively profitable venture in the study

area. For the marketing efficiency of the two categories of marketing, it is noteworthy that marketing efficiency is defined as the ratio of net marketing returns to marketing costs expressed as a percentage. According to Ozougwu (2002), marketing efficiency ratio ranges from zero (0) to infinity. A ratio of 100% shows that the market is perfectly efficient, because the increment is just high enough to cover the cost of marketing. It indicates a break-even point because the value addition

(marketing cost) is equal to the net margin obtained as a result of the value addition. Marketing efficiency figure below 100% is indicative of inefficiency; more is spent on value addition compared to the margin received after value addition. Marketing efficiency value that is greater than 100% indicates excess profit for the marketers (Scarborough and Kydd, 1992). The marketing efficiency scores for the two categories of marketers were 125.19% and 107.72% respectively, which are greater than 100%, thereby indicating that gari and fufu marketing in the study area is also efficient. It implies that in both

categories of marketing, excess profit was made, though the gari marketers had higher marketing efficiency, suggesting that the gari marketers could have found better means of reducing marketing costs and making more profit from a unit of the commodity relative to market cost. This result is consistent with Isibor and Ugwumba (2014), who reported marketing efficiency scores greater than 1 for various agricultural products in Nigeria including gari, indicating the potential of gari marketing for economic empowerment.

Table 5: Marketing margin and efficiency of gari and fufu marketing

Market Variables (N)	Gari marketers	Fufu marketers
A. Total Revenue	25000	22050
B. Total Cost	19970	20470
C. marketing Margin(A-B)	5030	1580
Market efficiency (%) $(A/B \times 100)$	125.19	107.72

Source: Field Survey Data, 2019

Factors Influencing Profitability of Gari

Table 6 shows the results of the regression estimates of determinants of profitability of gari marketing in the study area. The double-log functional form was selected as lead equation based on certain econometric criteria (high R^2 value, number of significant factors and a priori expectations). The R^2 value of 0.804 indicate an 80.4% variability in gari profit explained by the independent factors. The F-ratio was highly significant a 1% level, implying goodness of fit of the model. The coefficient of household size was negatively signed and significant at 5% level of probability. This implies that the larger the household size the lower the profit, due to high propensity to consume marketed surplus by the large household. The sign of this variable is in accordance with *a priori* expectation and consolidates the findings of Ademosun (2000). The coefficient of marketing experience was positively signed and significant at 1% level. The sign of this variable is also in tandem with *a priori* expectation. The implication is that the more

experienced a marketer is, the more he/she is able to take rational decisions which will increase profitability. The result consolidates Isibor and Ugwumba (2014), who obtained a similar outcome in their study on determinants of water melon marketing in Nnewi metropolis of Anambra State. The coefficient of storage cost was negatively signed and significant at 1% level. The sign of the variable is in consonance with *a priori* expectation. The result implies that the increase in the cost of storage would result to lower profitability. The coefficient of price of gari was positively signed and significant at 5% level. The sign of the variable is in consonance with *a priori* expectation. This implies that increase in the price of gari would lead to increase in profitability of gari. The coefficient of transportation cost was negatively signed and significant at 10%. The sign is in consonance with *a priori* expectation. The negative sign associated with the variable implies that a high transportation cost would reduce the profitability of the marketers.

Table 6: Regression Estimates of the Determinants of profitability among Gari Marketers

Variables	Linear	Exponential	Double log+	Semi-log
Constant	-15688.81 (-1.465)	-9.206*** (-16.238)	-3.509*** (-11942)	10756** (2.18)
Age (X ₁)	-118.752 (-91-0.553)	-0.001 (-0.128)	-0.245 (-0.712)	-2316.169 (-0.38)
Household size (X ₂)	-875.260** (-2.663)	-0.047** (-2.717)	-0.203** (-2.554)	-3196.770** (-2.270)
Educational level (X ₃)	-414.234 (-1.156)	-0.027 (-1.445)	-0.152 (-1.102)	-1748.074 (-0.72)
Marketing experience (X ₄)	-256011 (-0.563)	-0.018 (-0.766)	-0.639*** (-3.635)	-2401.668 (-1.322)
Handling cost(X ₅)	-0.121 (-0.189)	-3.266E-06 (-0.096)	-0.053 (-0.462)	-277.671*** (-15.285)
Storage cost(X ₆)	-5.386*** (-9.396)	0.000 (0.000)	-0.769*** (-11.047)	-18824.52*** (-15.285)
Price of gari (X ₇)	-1.053 (-1.424)	-3.089E-6** (-2.051)	-1.749** (-2.661)	-699.216 (-0.313)
Transportation cost (X ₈)	-1.151** (-2.284)	-5.18E-5* (-1.915)	-0.053* (-1.967)	-137.444 (-0.167)
R ²	0.817	0.768	0.823	0.858
Adjusted R ²	0.79	0.734	0.804	0.847
F-Ratio	42.890***	25.435***	46.775***	88.200***

Source: Field survey data, 2019

*** significant at 1%, ** significant at 5%, * significant at 10%, + lead equation, Figures in parenthesis are t-ratios

Factors Influencing Profitability of Fufu Marketing

The results in Table 7 show the regression estimates of the determinants of profitability among fufu marketers in the study area. The exponential functional form was chosen as the lead equation based on a high R² value, number of significant factors and agreement with *a priori* expectations. The R² value of 0.878 indicate an 87.8% variability in the fufu profit explained by the independent factors. The F-ratio was highly significant at 1% indicating goodness of fit of the model. The coefficient of household size had a positive relationship with fufu profit at 1% level of probability. This implies any increase in household size will lead to a corresponding increase in profit from fufu sales. The sign of the variable is at variance with *a priori* expectation. However, the explanation is not far-fetched. It could be that members of the fufu marketers' households helped to sell fufu at various outlets thus making more sales and profit. Another explanation could be that most of the household members were not economic dependents and contributed to the purse used to finance the fufu business. This result is at variance with Kalule and Kyanjo (2013) who obtained a negative relationship between household size and cooking

banana marketers' profitability in Kampala. Educational level was also positive and significant at 10% level. The implication is that any increase in educational level of the marketers, will lead to a corresponding increase in profitability. This is in line with *a priori* expectation. This result agrees with Nwankwo *et al.*, (2010), who stated that the level of educational attainment is likely to affect the degree of one's business acumen and ability to seize business initiatives and advantages, hence increased profitability. Handling costs had a negative effect on fufu marketers' profitability and was significant at 10% level. The sign implies that the greater the handling cost in the marketing process, the reduction in profitability. The result is in line with *a priori* expectation and compares favourably with Kalule and Kyanjo (2013). Price of fufu was positively signed and significant at 5% level. The sign of the variable is in consonance with *apriori* expectation and implies that increase in the price of fufu would lead to increase in net profit of the marketers. Transportation cost also had a negative and significant effect at 10% level. The sign of the variable is also in agreement with *a priori* expectation. This implies that increase in transportation cost reduces profit earned from fufu marketing.

Table 7: Regression Estimates of the Determinants of Profitability among Fufu Marketers

Variables	Linear	Exponential+	Double-log	Semi-log
Constant	9387.774 (0.408)	-8.820*** (-15.691)	-2.685* (-1.743)	-111918.180*** (-3.970)
Age(X ₁)	-105.467 (-0.5110)	-0.000 (-0.079)	0.138 (0.408)	-1744.62 (-0.283)
Household size(X ₂)	-533.673 (-1.399)	4.797*** (8.524)	-0.123 (-1.372)	-2769.909* (-1.690)
Educational level (X ₃)	446.519 -1.295	0.029* (1.671)	0.162 (-1.228)	1807.722 (-0.746)
Marketing experience (X ₄)	-157.411 (-0.360)	-0.012 (-0.524)	-1.102 (-1.007)	-2127.998 (-1.146)
Handling cost (X ₅)	-0.297* (-1.664)	-12447.953* (-1.906)	-0.127 (-1.622)	-674.39 (-0.472)
Storage cost (X ₆)	-2.739 (-1.226)	-0.003 (-0.94)	-0.672 (-1.403)	18312.037*** (11.459)
Price of fufu (X ₇)	-0.212 (-0.186)	2.512E-5** (2.416)	0.662*** (4.507)	-655.807 (-0.143)
Transportation cost (X ₈)	-1.091** (-2.271)	-4.680E-5* (-1.878)	-0.000 (-0.045)	-117.113 (-0.143)
R ²	0.823	0.878	0.829	0.858
Adjusted R ²	0.804	0.846	0.811	0.847
F-ratio	46.714***	57.823***	50.694	68.01***

Source: Field survey data, 2019

*** significant at 1%, ** significant at 5%, * significant at 10%, + lead equation, Figures in parenthesis are t-ratios

Conclusion

The marketers sourced their cassava tubers from the farm gate, wholesalers, retailers and own farms. The study concluded that gari and fufu marketing are profitable ventures, but gari is more profitable than fufu, with a significant difference between the two. Household size, marketing experience, storage cost, and transportation cost were the significant factors that influenced the profitability of gari marketing in the study area, while household size educational level, handling cost, price of fufu and transport cost also significantly influenced profit earned by fufu marketers. The study therefore recommends that: Marketers should be encouraged to form cooperatives to mitigate cost of marketing (transportation costs, handling costs and storage costs) while taking advantage of economies of scale. Policy on price control mechanisms is advocated to mitigate price volatility for enhanced profit. Trainings, workshops and seminars should be organized for the marketers to update their basic skills in cassava by-products marketing.

References

- Ademosun, A. A. (2000). Structural Adjustment and Nigeria Livestock Industry: Keynote Address at the Nigeria Society for Animal Production Conference at University of Agriculture Markurdi held on 22-25th August, 2000.
- Abbott, J. C. and Makeham, J.P (1990). Agricultural Economics and Marketing in the Tropics, London. Longman Group Ltd.
- Anthony, F. C. (2008). Education by nation multivariate analysis. Retrieved October 22, 2019 from <http://www.user.muoho.edu/porterban/sun/2006/start>
- Bishop-Sambrook, V.N (2005). Marketing margin and spatial price efficiency of palm oil in Edo State, Nigeria: implications for food security. Proceedings of the International Agricultural Conference, Faculty of Agriculture, Anambra State University, Igbariam Campus.
- Chukwuji, C.O., Ike, P.C. and Inoni, O.L. (2007). Determinants of Technical Efficiency in Gari processing in Delta State, Nigeria. Paper presented at the 2004 Annual Conference of the Nigerian Association of Agricultural Economists at Ahmadu Bello University, Samaru-Zaria.
- Dimelu, M.U., Okoye, A.C., Okoye, B.C., Agwu, A.E., Aniedu, O.C. and Akinpelu, A.O. (2009). Determinants of Gender Efficiency of Small-Holder Cocoyam Farmers in Nsukka Agricultural Zone of Enugu State Nigeria. *Scientific Research and Essay*, 4(1): 28–32.
- Emokaro C.O. and Erhabor, P.O. (2006). Comparative Analysis of Input Used and Profitability among Cassava Farmers in the Three Agro- Ecological Zones of Edo State. *Journal of Sustainable Tropical Agricultural Research*, 19:16-22.
- Ezedinma, C., Dixon, A.G.O., Sanni, L., Okechukwu, R., Akoroda, M., Lemehi, J., Ogbé, F. and Okoro, E. (2005). Trends in Cassava Production and Commercialization in Nigeria. International Institute of Tropical Agriculture report. 53pp.
- Ezedinma, C .I. (2005). Impact of Trade on Domestic Rice Production and the challenge of Self-sufficiency in Nigeria. Paper presented at the Workshop on Rice Policy and Food Security in Sub-Saharan Africa, organized by WARDA, Cotonou, Republic of Benin.
- FAO (2001). Food and Agriculture Organization. Food

- crop and storage. Corporate Document Repository and Database. Rome.
- FAO (2012). Food and Agricultural Organization. Food Security Statistics- Nigeria; FAOSTAT.
- Farinde, A.J. and Ajayi, A.O. (2005). Training needs of women farmers in livestock production: Implications for rural development in Oyo State of Nigeria. *Journal of Social Science*, 10:159-164.
- Iheke, O. R. (2010). Impact of Migrant Remittances on Efficiency and Welfare of Rural Smallholder Arable Crop Farm Households in South Eastern Nigeria. PhD Dissertation, Michael Okpara University of Agriculture, Umudike.
- Iheke, O. R. and Ukaegbu, H. I. (2015). Effect of Poor Health and Farmers' Socioeconomic Variables on Total Factor Productivity of Arable Crop Farm Households in Abia State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment*, 11(3):141-146.
- Imonikehe, D.C. (2010). Structure, conduct and performance of tomato marketing in Ghana. *Journal of Economics and Sustainable Development*, 10(3):2222-2855.
- IITA (2004). International Institute of Tropical Agriculture. Pre-emptive management of the virulent cassava mosaic disease through an integrated cassava development approach for enhanced Rural Sector Economy in the South-South and South-East Zones of Nigeria. International Institute for Tropical Agriculture, Ibadan. Pp.79.
- Isibor, A. C. and Ugwumba, C. O. A. (2014). Analysis of Watermelon (*Citrullus lanatus*) Marketing in Nnewi Metropolis of Anambra State, Nigeria. *Journal of Sciences and Multidisciplinary Research*, 6(2): 1-8.
- Kalule, S. W. and Kyanjo, J. L. (2013). Marketing Margins and Efficiency of Cooking Banana Retail Trade in Kampala City, Uganda. *International Journal of Sales and Marketing*, 3(4): 9- 18.
- NPC (2006). National Population Commission. A Blueprint of 2006 National Census Abuja, Nigeria.
- Ndirika, V.I.O. (2011). Status of Agro- Processing in Nigeria: Challenges in Alleviating Food Crisis: In Globalization and Rural Development in Nigeria” Ike Nwachukwu and Kenneth Ekwe (eds.) Michael Okpara University of Agriculture, Umudike, Extension Centre.
- Ndukwu, P.C., Nwaru, J.C. and Okoye, B.C. (2010). Gender and Relative Economic Efficiency in Sweet Potatoe Farmers of Imo State, Nigeria. A stochastic Cost Frontier Approach. *The Nigerian Agricultural Journal*. 41:1:65-70.
- NRCRI, (2008). National Root Crops Research Institute. Cocoyam Programme, NRCRI, Umudike, Annual Report.
- Nwakor, E.W. (2012). Evaluation of Cassava Processing and Utilization Forms among Farmers in Abia State, Nigeria. *Int. J. Appl. Res. Technol.* 2012.
- Nwankwo, O. O., Nwajiuba, C.U. and Eze, C.C. (2010). Profit margin analysis of mechanized cassava flour processing in Abia State. Proceedings of the 44th Annual Conference of Agricultural Society of Nigeria “LAUTECH” 2010. Pp.73.
- Nwaru, J. C. (2004). Rural Credit Markets and Resource Use in Arable Crop Production in Imo State of Nigeria. PhD Thesis, Michael Okpara University of Agriculture, Umudike.
- Nwauwa, L. (2011). Gender impacts of small-scale farm households on agricultural commercialization in Oyo state, Nigeria. *British Journal of Economics, Management and Trade*, 3 (1): 1-11.
- Nweke F.I. (2004). New Challenges in the cassava transformation in Nigeria and Ghana, Discussion paper no. 118. Environment and Production Technology Division International Food Policy Research Institute, Washington.
- Nweke, F.I., Ugwu, B. O., Dixon, A.G.O., Asadu, C.L.A. and Ajobo, O. (2004). Cassava production in Nigeria: A Function of Farmer access to market and to improve production and processing technologies. COSCA working paper No. 21. Collaborative Study of Cassava in Africa, International Institute of Tropical Agriculture, Ibadan, Nigeria.
- Nwosu, C. S., Onyeneke R. U. and Okoli, V. B.N. (2012). Socioeconomic determinants of fluted pumpkin leaf (*telferia occidentalis*) production in Ezinihitte Mbaise Local Government Area of Imo State, Nigeria. *Agricultural Science Research Journal*, 2(6):355-361.
- Offor, E.I., Onu, D.O. and Nnamani, G.N. (2017). Economics of Banana Marketing in Umuhia South Local Government Area of Abia State, Nigeria. *Nigerian Journal of Agriculture, Food and Environment*, 13(3): 65 – 69.
- Ogundere, C.O. (2007). Stimulating Rural Employment and Income for Cassava Processing Farming Households in Oyo State, Nigeria through Policy Initiatives. *Journal of Development and Agricultural Economics*, 2(2), 18-25.
- Okoye, B.C. (2010). Analysis of market participation among smallholder cassava farmer in response to transaction costs in south Eastern Nigeria Unpublished Ph.D Thesis, Agricultural Economics Department, Michael Okpara University of agriculture Umudike.
- Onya, S.C., Oriala, S.E1., Ejiba, I.V. and Okoronkwo, F.C. (2016). Market Participation and Value Chain of Cassava Farmers in Abia State. *Journal of Scientific Research & Reports*, 12(1): 1-11.
- Onyeka, T. J., Nwosu, K. I., Asiedu, R. and Chukwu, G. O. (2014). Cocoyam root rot disease in Nigeria: what we know and what we need to now. Paper presented at the *1st International Workshop on Cocoyam*, IRAD, Ekonna, Cameroon, 29-31 October, 2008.
- Onyenweaku, C.E. and Mbuba, A.C (1991). The Adoption of the Seed-Yam Minisett Multiplication Technique by Farmers in Anambra State, Nigeria. *Nigerian Journal of Agricultural Extension*. 6 (1&2):26-33.
- Ozougwu, F. C. (2002). Economic Analysis of Rice Marketing Margin among participants in the marketing channel of rice in Adani in Uzo-Uwani Local Government Area, Enugu State. M.Sc. Thesis,

- Department of Agricultural Economics, University of Nigeria, Nsukka.
- Phillip, T.P., Taylor, D. S., Sanni, L. and Akoroda, M.O. (2004). A cassava industrial revolution in Nigeria.: the potential for a new industrial crop. International Fund for Agriculture Developments and Food and Agriculture Organization, Rome. Pp1-49
- Scarborough, V. and Kydd, J. (1992). Economic Analysis of Agricultural Markets: A manual. Chatham, UK: Natural Resources Institute, ODA. 166p.
- Solomom, D.N., Obinna, L. and Chukwu, G.O. (2006). Culture and Agricultural Development. In Book of Readings, Department of Rural Sociology and Extension of Michael Okpara University of Agriculture, Umudike, Nigeria.
- Ugwumba, C.O.A. (2014). Fermented cassava flour marketing in Owerri metropolis of Imo State, Nigeria. *Scholars Journal of Agriculture and Veterinary Sciences*, 1(2):100-104.