

Economic Analysis of Cassava Value Chain Products in Etche Local Government Area, Rivers State, Nigeria

Okuduwor A. A^{1*}, Worlu A. A², Oyibo S. J³

Faculty of Agriculture, Rivers State University

Corresponding Author: Okuduwor A. A adibie.okoduwor@ust.edu.ng

ARTICLE INFO

Keywords: Cassava, Value Chain, Products, Processors

Received : 22, February

Revised : 03, April

Accepted: 10, May

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ABSTRACT

The research work on the economic analysis of cassava value chains was conducted in Etche LGA, Rivers State. The objectives of the study were to analyze the socio-economic characteristics of the respondents, examine the economic impact of cassava value-chain products, evaluate the profitability of cassava value-chain products, and identify constraints faced in cassava conversion. The findings also showed that inadequate finance, poor road network, high cost of cassava tubers, high cost of transportation, inadequate processing materials, poor package facilities, low income of farmers, sourcing of labor, and lack of or inadequate storage facilities were major constraints to the conversion of cassava to fufu, garri, starch, and flour. The study concluded that the cassava value chain is lucrative and highly profitable in the study area. It was recommended that funds be provided for them to acquire more lands and processing materials for maximum production, and individual and communal efforts should be harnessed to provide efficient processing and storage facilities where processors can assess at very affordable prices for the general public.

INTRODUCTION

Cassava (*Manihot* spp) is one of the world's most important staple food crops which provide a major source of carbohydrate to those who feeds on it. Many developed oriented policies have been implemented in Nigeria, especially in the agricultural sector since independence to enhance cassava production. Cassava is an important source of dietary carbohydrate, and provides food for over 60 million people in Nigeria (Abdulahi, 2003). Cassava's adaptability to relatively marginal soils, erratic rainfall; its high productivity per unit of land and labour, the certainty of obtaining some yield even under the most adverse conditions and the possibility of maintaining continuity of supply throughout the year (Nweke, 1994), make this root crop a basic component of the farming system in many areas of Nigeria including Rivers State. Apart from its use as a staple food to human beings' other uses include animal feed formulation, agro-industrial uses (e.g. starch, ethanol, adhesive, fructose/glucose syrup), the peels in organo-mineral fertilizers formulation (Iyagba, 2010). Cassava has become the relevant crop in Nigeria as a result of the Presidential initiative on cassava some years ago with good export potential.

Cassava is a perennial, subtropical crop which is valued for its underground starchy tubers roots (Islam et al., 2008). It is a starchy root crop grown mostly in the hotter low land tropics and is an important source of energy as a staple food for more than 500 million people in Africa, Latin America and Asia (Hillocks, 2002). Tuber of cassava is also used as raw materials in the garment, bakery, food and pharmaceutical industries (IITA, 2011; Fakir et al., 2012). cassava flour as a mixture with wheat flour can be used to make nutritious food and food products. Its tuberous root contains 30-40% dry matter and 25-30% starch. Nutritionally, cassava contains potassium, iron, calcium, vitamin A, folic acid, sodium, vitamin C, vitamin B-6 and protein (Montagnac et al., 2009). Nutritional quality especially protein can be added in composite flours in cassava-soya, cassava-peanut bread. There is much variation in the nutrient quality of the cassava root (Chaves et al., 2005). The starch content of the fresh cassava root is about 30% and gives the highest yield of starch per unit area of any crop known (Tonukari, 2004). The protein content is extremely low, however, and ranges between 1-3% (Salcedo et al., 2010). The cassava root contains significant amounts of iron, phosphorus and calcium and is relatively rich in vitamin C (Enidiok et al., 2008).

The root of the plant is used to make a variety of items in its processed form, whether processed locally or industrially, it is processed either into garri, fufu, starch, flour, tapioca, akara etc from a starch found in its puddings and other foods (Abolaji, Sinyanbola, Afolabi & Oduola, 2007). The major states of Nigeria that produce cassava are Anambra, Delta, Edo, Benue, Cross River, Imo, Oyo, and Rivers, and to a lesser extent Kwara and Ondo. In 1999, Nigeria produced 33 million tonnes. As of 2000, the average yield per hectare was 10.6 tonnes (CBN, 2002). The supply of cassava offers prospects for great income generation not limited to the bakery and pharmaceutical industries demand for

flour and starch, but the demand for other of its value chains such as fufu, garri, starch and flour etc. Fufu, garri, starch ,and flour are some of the processed forms of Cassava. Fufu, garri, starch ,and flour are staple food common in the West African countries and the Central Africa such as Cote d'Ivoire, Sierra Leone, Guinea, Senegal, and Cameroon.

Innovations is the mother of all inventions, hence the roles of agricultural innovations like processing of Cassava to its fufu,garri, starch and flour value chain is eluding Nigeria. Adoption of innovations especially in converting cassava to fufu,garri, starch and flour value chain in general is one of the corner stones to economic empowerment. Therefore, the broad objective of this study is to analyze the economics of cassava value chain products in Etche LGA of Rivers State in Nigeria, specifically to describe the socio economic characteristics of the respondents, evaluate the economic impacts of cassava value chain products in the study area, determine the profitability of the products, and constraints faced by the processors.

LITERATURE REVIEW

Cassava is a perennial, subtropical crop which is valued for its underground starchy tubers roots (Islam et al., 2008). It is a starchy root crop grown mostly in the hotter low land tropics and is an important source of energy as a staple food for more than 500 million people in Africa, Latin America and Asia (Hillocks, 2002). Tuber of cassava is also used as raw materials in the garment, bakery, food and pharmaceutical industries (IITA, 2011; Fakir et al., 2012). cassava flour as a mixture with wheat flour can be used to make nutritious food and food products. Its tuberous root contains 30-40% dry matter and 25-30% starch. Nutritionally, cassava contains potassium, iron, calcium, vitamin A, folic acid, sodium, vitamin C, vitamin B-6 and protein (Montagnac et al., 2009). Nutritional quality especially protein can be added in composite flours in cassava-soya, cassava-peanut bread. There is much variation in the nutrient quality of the cassava root (Chaves et al., 2005). The starch content of the fresh cassava root is about 30% and gives the highest yield of starch per unit area of any crop known (Tonukari, 2004). The protein content is extremely low, however, and ranges between 1-3% (Salcedo et al., 2010). The cassava root contains significant amounts of iron, phosphorus and calcium and is relatively rich in vitamin C (Enidiok et al., 2008).

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forms of Cassava. Fufu, garri, starch, and flour are staple food common in the West African countries and the Central Africa such as Cote d'Ivoire, Sierra Leone, Guinea, Senegal, and Cameroon.

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METHODOLOGY

Study Area

The research on the economic impact of cassava value-chain products was carried out in Etche LGA in Rivers State Nigeria, its headquarter is at Okehi. It covers a land area of 774.7km² and at the 2006 census it had a population of 249,939. The major occupation of the people is farming, though its subsistent with other kind of activities like hunting, poultry and trading. It has a geographical coordinates Latitude of 4.9908, Longitude of 7.05 44'0 North, 70 18'0 East coordinates. The LGA is bounded by Abia State, Imo State, Ikwerre and Obio-Akpor LGA. Etche Communities include Akwu/Obuor, Eberi, Amaji, Opiro, Chokocho, Igboh, Ohimogho, Obiohia, Umuogba, Umuajuloke, Okehi, Obibi, Odufor, Nihi, Okomoko, Ulakwo, Umuakonu, Umuanyagu, Okoroagu, Obite, Umoye, Igbo, Umuechem, and Egbeke, Umulebulu, Aberah, Eguye.

Sampling Procedure and Sample Size

Multi-stage sampling technique was used to determine the sample size for the study. In the first stage, ten (10) communities were purposively chosen from the total number of communities in the study area because of their dominance in cassava production. In the second stage, fifteen (15) farmers were randomly chosen from each of the communities already selected from different locations in Nihi, Opiro, Odufor, Umuechem, Obibi, Okehi, Obiohia, Igboh, Chokocho and Ulakwo. In all, a total of 150 respondents formed the sample size for the study.

Data Collection

Data for this study was obtained from primary source via questionnaire.

Analytical Techniques

Descriptive statistical tools such as percentage, frequency, mean and gross margin were used to analyze the obtained data.

RESEARCH RESULT

Table 1. Socio Economic Characteristics of the Respondents (n=150)

Variables	Category	Frequency	Percentages (%)
Sex	Male	90	60.00
	Female	60	40.00
Age (in years)	<15	10	6.67
	16-20	12	8.00
	21-30	30	20.00
	31-40	45	30.00
	41-50	28	18.67
	>50	25	16.66
	Marital Status	Single	52
Married		65	43.33
Divorced		33	22.0
Level of Education	Non-formal	21	14.00
	Primary	35	23.33
	Secondary	52	34.67
	Tertiary	42	28.00
Farming Experience (In years)	<1	3	2.00
	2-4	23	15.33
	5-10	31	20.67
	11-15	53	35.33
	>15	40	26.67
Household Size	1-5	53	35.30
	6-10	94	62.70
	11-15	3	2.00
Religion	Christian	120	80.00
	Muslim	7	4.67
	Tradition	23	15.33
Occupation	Farming	65	43.33
	Trading	30	20.00
	Civil Servant	36	24.00
	Artisan	19	12.67

Source: Field Survey, 2022

Sex of the Respondents

From table 1, the results indicated that 60.00% of the cassava processors were male, while 40.00% of the cassava processors were female. This implies that the business involves more male producers than female in cassava value chain products; This finding contradict with Ndubueze et al., (2015), did contrary study in Ughelli, Delta State and found out that, majority (78.6%) of the respondent involved in garri processing were female. Also Nwaneri et al., (2015) confirmed that the populations of garri processors were dominated by female which contradicts the findings of this study.

Age of the Respondents

Results also indicated age of respondents which ranges from < 15, 15-20, 21-30, 41-50 and >50 years had 6.67%, 8.00%, 20.00%, 18.67% and 16.66% respectively. However, most (30.00%) of the cassava producers had age range between 31-40years. This implies that the age of respondents plays a critical role in cassava production in the study area, hence, the more energetic the individual, the higher the possibility of him or her to perform better compared to the much younger or the much older producers.

Marital Status of the Respondents

For respondent's marital status, (43.33%) of the cassava processors were married, about (34.67%) of the respondents were single, followed by (22.00%) of the respondents which were divorced. This implies that men and women who are actively in cassava production are responsible men and women who have family to cater for, do also depend on this business. This is in consonant with the findings of Bello et al., (2008), the study on rural women processing of cassava in Doma Local Government Area of Nassaraw State.

Educational Status of the Respondents

Respondents' educational status indicated that (14.00%) of cassava dealers had no formal education. (23.33%) of the respondents had primary education followed by secondary education which had the majority of the respondents with (34.67%), tertiary education (28.00%) of the respondents. This reveals that majority of the cassava processors are educated. This implies that, they should be able to understand the use of improved technologies and efficiency and apply them to improve productivity. This finding agreed with that of Agbugba and Thompson (2015) that majority of cassava farmers do not have the resources to get higher education.

Farming Experience of the Respondents

In experience of the respondents, the results showed that (35.33%) of the respondents had 11-15 years of farming experience followed by (26.67%) of the respondents which indicated that they had >15 years of farming experience. The rest (20.67%), (15.33%) and (2.00%) of the respondents

indicated that they had 5-10, 2-4 and <1 years of farming experience respectively. This implies that majority of the processors has taken into cassava processing for quite a while in the study area and have enough experience on the management of the business. This agrees with the finding of Morris et al., (2022) on comparative study on profitability of garri production and marketing in Khana Local Government, Rivers State, Nigeria.

Household Size of the Respondents

For household size, the results showed that (35.30%) of the respondents had ranges of 1-5 persons as their household size followed by (62.70%) of the respondents which indicated that 6-10 (which is above the national average household size of 5 persons. This implies that since agricultural activities are labour intensive, large household size can provide farming labour at little or no cost. (Okolo, 2007). However, Babalola (2013) opined that with increasing household size, respondents tend to divert funds originally meant for enterprise expansion to cater for domestic household needs.

Religion of the Respondents

The results showed that majority of the respondents practiced Christian religion with (80.00%) while the rest (15.33%) and (4.67%) are Muslim and Traditional, all things remain equal.

Occupation of the Respondents

The respondents (43.33%) are mainly engaged in farming, (20.00%) of the respondents are into trading, (24.00%) are civil servant and (12.67%) are artisan. This implies that those that are into farming are the majority and they depend on it for their livelihood.

Table 2. Economic Impact of Cassava Value Chain Products

Influence of Cassava Value Chain	SA	A	D	SD	Mean
Reduce the rate of crime in the society	60 (40.0)	48 (32.0)	19 (12.7)	23 (15.3)	2.97
Create employment for the people	58 (38.7)	46 (30.7)	29 (19.3)	17 (11.3)	2.96
It helps in income generation	41 (27.3)	63 (42.0)	35 (23.3)	11 (7.3)	2.89
Improve the livelihood of the people	39 (26.0)	42 (28.0)	33 (22.0)	36 (24.0)	2.56
It helps to improve food security	47 (31.3)	58 (38.7)	31 (20.6)	14 (9.3)	2.92
It encourages diversification of occupation	47 (31.3)	58 (38.7)	19 (12.6)	26 (17.3)	2.84
It open room for external investors	21 (14.0)	28 (18.6)	52 (34.7)	49 (32.6)	2.14
It reduces the level of hunger among the people	60 (40.0)	54 (36.0)	16 (10.7)	20 (13.3)	3.03

Source: Field Survey, 2022

Table 2 examine the economic impact of cassava value chain products in the study area. Item 1, in table 2 shows that (40.0%) of the respondents strongly agreed that cassava value chain helps to reduce the rate of crime in the society, most (32.0%) of the respondents agreed with the statement, (12.7%) disagreed while (15.3%) of the respondents strongly disagreed that cassava value chain reduce the rate of crime in the society. On item 2, most of the respondents (38.7%) strongly agreed that cassava value chain helps in employment/job creation, (30.7%) respondents agreed, (19.3%) respondents disagreed, while (11.3%) respondents strongly disagreed with the statement. On item 3, most of the respondents (27.3%) strongly agreed that cassava value chain helps in income generation, majority of the respondents (42.0%) agreed with the statement, (23.3%) disagreed, while (7.3%) strongly disagreed with the statement that cassava value chain helps in income generation.

On item 4, majority (28.0%) of the respondents agreed that cassava value chain improves the livelihood of the people, follow by (26.0%) respondents strongly agreed, (22.0%) disagreed, while (24.0%) of the respondent strongly disagreed with the statement that cassava value chain improves the livelihood of the people. On item 5, most (38.7%) of the respondents agreed that cassava value chain improves food security, (31.3%) respondents strongly agreed, (20.6%) disagreed while (9.3%) strongly disagreed with the statement. On item 6, most of the respondents (38.7%) agreed that cassava value chain encourages diversification of occupation of the processors, (31.3%) strongly agreed, (12.6%) respondents disagreed while (17.3%) of the respondents strongly disagreed with the statement. On item 7, majority (34.7%) of the respondents disagreed that cassava value chain opens room for external investors, follow by (32.6%) respondents strongly disagreed, (18.6%) agreed while (14.0%) strongly agreed that cassava value chain opens room for external investors.

Finally, on item 8, most (40.0%) of the respondents strongly agreed that cassava value chain reduce the level of hunger among the people, (36.0%) respondents agreed, (10.7%) disagreed, while (13.3%) strongly disagreed with the statement. The economic implication of this is that items which had a mean score of 2.97, 2.96, 2.89, 2.56, 2.92, 2.84 and 3.03 indicated that cassava value chain products has helped reduce the rate of crime in the society, create employment for the people, increase income generation, improve the livelihood of the people, improve food security encourages diversification of occupation and reduce the level of hunger among the people, therefore, cassava value chain has great economic impact in the study area. This conforms with the findings of Madu et al., (2018) on gender preferred traits on cassava production and processing value-chain in Imo State, Nigeria.

Table 3. Profitability of Cassava Value Chain Products

Average Cost Components	Garri (N)	Fufu (N)	Flour (N)	Starch (N)
Variable Cost (VC) Items				
Cassava Tubers/200kg	27,000	18,500	15,000	16,700
Transportation Cost	2,500	2,350	2,000	1,700
Cost of Firewood (energy)	5,000	3,000	2,700	2,450
Market charges (Tax)	500	300	200	200
Grinding and Pressing	2,000	1,600	1,000	1,200
Frying/Pounding	5,000	4,700		
Milling			2,500	
Peeling	5000	4,200	3,800	3,400
Chopping		1,950	1,450	
Filtrations				2,000
Drying				1,700
Total Variable Cost (TVC)	47,000	36,600	28,650	29,350
Fixed Cost (FC) Items				
Depreciation on fixed cost items		2,105	1,785	1,250
Total Fixed Cost (TFC)	2,155	2,105	1,785	1,250
Total Cost (TC)	49,155	38,705	30,435	30,600
Total Revenue	112,900	81,250	57,900	40,850
Gross Margin	65,900	44,650	29,250	11,500
Net Income	63,745	42,545	27,465	10,250
ROI	1.29	1.09	0.90	0.33

Source: Field Survey, 2022

Average Profit in Cassava Value Chain Products

The costs structure and returns in garri, fufu, flour and starch processing among small scale cassava processors is presented in Table 3. Findings indicate that variable cost items constitute the bulk (N47,000, N36,000, N28,650 and N29,350 for garri, fufu, flour and starch respectively) of the total cost in cassava processing. Therefore, they are very crucial to the success in both garri, fufu, flour and starch processing in the study area. Similarly, fresh cassava tubers/200kg accounted for about N27,000, N18,500, N15,000 and N16,700 of total variable cost (TVC) respectively and is therefore, important in the determination of the success of the cassava processors under the prevailing environment. On the average, garri, fufu, flour and starch processors made a net farm income of N63,745, N42,545, N27,465 and N10,250 respectively. The return on investment (ROI) in both garri, fufu, flour and starch processing are 1.29, 1.09, 0.90 and 0.33 respectively. This shows that for every N1 invested in garri, fufu, flour and starch processing, a return of 129 Kobo, 109 Kobo, 90 Kobo and 33 Kobo is earned respectively. This is an indication that garri, fufu, flour and starch processing are profitable and viable enterprises in the study area. This is in line with the findings of Achoja Felix Odemero (2015) on Impact of Cassava

Value-Chain Intensification Intervention on Nigeria Economy: Evidence from Niger State, Nigeria.

Table 4. Shows the Summary Statistics of the Constraints Encountered by the Cassava Value Chain Processors by Using Mean Score and Remark

Constraints	Mean	Ranking	Result	Remark
Inadequate finance	3.81	1	>	Agree
Low income of farmers	3.35	2	>	Agree
High cost of cassava tubers	3.20	3	>	Agree
High cost of transportation	3.15	4	>	Agree
Inadequate processing materials	3.04	5	>	Agree
Poor road network	2.74	6	>	Agree
Sourcing of labour	2.70	7	>	Agree
Lack/inadequate storage facilities	2.69	8	>	Agree
Poor package facilities	2.56	9	>	Agree
Inadequate awareness	2.47	10	<	Disagree

Criterion Mean: >2.50

Source Data: Field Survey, 2022

Constraints Encountered by the Respondents

The problems faced by the cassava processors in the study area were ranked as shown on table 4. 10 items on the questionnaire were used to address the constraints. Items number 1, 2, 4, 5, 6, 8, 9 and 10 were agreed with by respondents (as they all had criterion mean scores greater than 2.50) indicated that inadequate finance, poor road network, high cost of cassava tubers, high cost of transportation, inadequate processing materials, poor package facilities, low income of farmers, sourcing of labour and lack/inadequate storage facilities were major constraints to conversion of cassava to fufu, garri, starch and flour. However, item 3 which had a mean score of 2.45 (lower than the criterion mean) indicated inadequate awareness was not serious constraints encountered by the respondents. This is in line with the findings of Achoja (2015) on Impact of Cassava Value Chain Intensification Intervention on Nigeria Economy: Evidence from Niger State, Nigeria.

CONCLUSIONS AND RECOMMENDATIONS

The systematic literature reviewed has unveiled the influence of cassava value-chains products contributions on the socio-economic status of the processors in Etche Local Government Area of Rivers State. Cassava value chain is lucrative and highly profitable in the study area because for every N1 invested 129 Kobo, 109 Kobo, 90 Kobo and 33 Kobo was gained by the respondents in the study area, with minimal risk and have economic impact in the study area. From these findings, the following recommendations were made: The general public both male and female should be encouraged to take career in cassava value chain as it helps to alleviate poverty level of many families and provides employment opportunity for many Nigerians,

Government should provide access to credit so that the processors can acquire more lands and processing materials for maximum production, and individual and communal efforts should be harnessed to provide efficient processing and storage facilities where processors can assess at very affordable prices.

The research work on economic analysis of cassava value-chains products was conducted in Etche LGA, Rivers State. The objectives of the study were to analyze the socio-economic characteristics of the respondents, examine the economic impact of cassava value-chain products, evaluate the profitability of cassava value-chain products, and to identify constraints faced in cassava conversion. Multi-stage sampling procedure was used to select one hundred and fifty respondents, primary data was used via questionnaire, descriptive statistic and gross margin was used, the results shows that age range of 31-40 years with 30% dominant the chain; its gender inclusive with male having 60.00% and female 40.00%; 43.33% are married, majority of them are literate, with 33% having 11-15 years of experience; most of the respondents affirmed that cassava value chain products has helped reduce the rate of crime in the society, create employment for the people, increase income generation, improve the livelihood of the people, improve food security, encourages diversification of occupation and reduce the level of hunger among the people, therefore, cassava value chain has great economic impact in the study area.

Findings of the study indicated that processors made a net farm income of #63, 745, #42, 545, #27,465 and #10,250 for garri, fufu, flour, and starch respectively, indicating that garri, fufu, flour and starch processing are profitable and viable enterprises. The findings also showed that Inadequate finance, poor road network, high cost of cassava tubers, high cost of transportation, inadequate processing materials, poor package facilities, low income of farmers, sourcing of labour and lack/inadequate storage facilities were major constraints to conversion of cassava to fufu, garri, starch and flour. The study concluded that cassava value chain is lucrative and highly profitable in the study area. It was recommended that fund be provided for them to acquire more lands and processing materials for maximum production, and individual and communal efforts should be harnessed to provide efficient processing and storage facilities where processors can assess at very affordable prices in general public.

ADVANCED RESEARCH

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