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ECONOMIC ANALYSIS OF CASSAVA PROCESSING IN YEWA SOUTH LOCAL GOVERNMENT AREA, OGUN STATE, NIGERIA

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ABSTRACT

This study was carried out to examine cassava processing and marketing activities. The study was based on primary data obtained in a cross-sectional survey of 80 processors drawn through multi-stage sampling techniques from the study area. Data were analysed using descriptive statistics, Ordinary Least Square (OLS) and Gross Margin Analysis. The study found that majority (80%) of the processors was females with mean age of 39 years. The processors in the sample were illiterates (48.8%). The mean gross margin per processor per month was ₦39,729 while the mean Total Variable Cost was ₦38,007.21 and average total revenue was ₦77,736.88, the rate of return on investment (ROI) was 2.00 meaning that cassava processing was profitable in the study area. OLS regression estimates revealed however that cost of cassava tubers, age, labour and processing technique were significant variables affecting the quantity of cassava processed in the study area. The study found that majority of the processors was into fufu processing and have no formal education. Transportation and insufficient funds happen to be the problem militating against higher output as well as high cost of cassava tubers. The study recommended among others, that government and non-governmental organisations through extension agents should encourage the processors to form themselves into virile cooperative and other recognized formal groups for purpose of obtaining loan and also modern technique of processing should be embarked upon in order to boost their productivity.

KEYWORDS: Processing, cassava products, women, OLS regression and gross margin

INTRODUCTION

Cassava is one of the world most important food crops with an annual output of over 34 million tonnes of tuberous roots (Asogwa *et al.* 2013). Throughout the tropics, its roots and leaves provide essential calories and income. Africa is one of the continents of the world where some 600 million people are dependent on cassava for food (International Fund for Agricultural Development (IFAD) 2013). Cassava is produced largely by small-scale farmers using rudimentary farm implements and most of the cassava produced is used for human consumption. Cassava per capita consumption is very high and provides about 80 % of the total energy intake of many Nigerians (Ani 2010). As a food crop, cassava fits well into the farming systems of the smallholder farmers in Nigeria because it is available all year round, thus ensuring household food security. Compared to grains, cassava is more tolerant to low soil fertility and more resistant to drought, pests and diseases (Obisesan 2012). Its roots store well in the ground for months after maturity (Ope-Ewe *et al.* 2011).

Apart from livestock feeds, processed cassava serves as industrial raw material for the production of adhesives, bakery products, dextrin, dextrose glucose, lactose and sucrose. Food and beverage industries use cassava products in the production of jelly caramel and chewing-gum, pharmaceutical and chemical industries also use cassava alcohol (ethanol) in cosmetic and drug production. Cassava cubes are used mainly in the compounding of livestock feeds. Thus there is a very high demand for cassava products both in local and foreign markets (Foundation for Partnership Initiatives in the Niger Delta, Foundation for Partnership Initiatives in the Niger Delta- PIND 2011; AbdulAzeez 2013). The growth in cassava production has been primarily due to rapid population growth, large internal market demand, complemented by the availability of high yielding improved varieties of cassava, a relatively well-developed market access infrastructure, the existence of improved processing technology and a well-organized internal market structure (Onyinbo *et al.* 2011).

Women play a central role in cassava production, processing and marketing, contributing about 58 per cent of the total agricultural labour in the southwest, 67 per cent in the southeast and 58 per cent in the central zones (PIND, 2011). They are almost entirely responsible for processing cassava. This provides additional income-earning opportunity as well as enhancing its ability to contribute to household food security (FMANR 2006). The Federal Government's policy of including cassava flour in bread and other confectioneries to substitute wheat flour has presented great opportunities for investors and farmers alike. However, several constraints affect cassava processing which limit the contribution of the crop to the development of Nigeria's economy (Adebayo and Sangosina 2005; Ntawuruhunga, 2010). Products derived from cassava include *garri*, starch, *tapioca*, *fufu*, pellets, flour and chip. However, this study focused on products derived from cassava roots which are: *garri*, chips and flour among others such as *tapioca*, starch, etc.

METHODOLOGY

The study was carried out in Yewa South Local Government Area of Ogun State which is one out of the twenty Local Government Areas of Ogun state. Yewa South is located in the West of Ogun state, Nigeria bordering the Republic of Benin. It has a land area of 629km² and a population of 168,850 (2006 census). Yewa South has 10 wards which include Ilaro I, II, III, Iwoye, Idogo, Owode I, II, Ilobi, Oke-Odan and Ajilete. Yewa south people are predominantly farmers and traders while very few engage in crafts. The main crops grown include cassava, yam, palm kernel, maize, cocoa, kolanut, pepper cocoyam, vegetables and fruits. The people speak the Yewa and Egun dialects of the Yoruba language.

Sampling Procedure

A multistage sampling technique was used in selecting 80 cassava processors in the study area. Yewa south comprises of ten wards. Stage one involved the random selection of five wards from the ten wards. From each of the five wards, two villages were randomly selected making a total of 10 villages and out of which eight processors were randomly selected from each village for interview.

Method of Data collection and Sources

Primary data was used in this study. These were collected by personal interview and recording with the aid of structured questionnaire from the respondents (cassava processors). Data were collected on socio-economic characteristics of the processors, input cost and returns, processing methods and constraints limiting production.

Analytical Techniques

Descriptive Statistics .Frequency tables and percentages were used to describe the socio-economic characteristics of processors, processing pattern and methods, constraints to processing.

Budgetary Analysis (Analysis of cost and returns)

This estimates the financial outcome or profitability of a particular business. This was used to determine the costs and returns to factors of production involved in cassava processing. Ratio was used to measure the profitability.

$$GM = TR - TVC \tag{1}$$

$$TR = P \times Q \tag{2}$$

GM=Gross Margin

TR = Total Revenue accruable from the sales

TVC = Total variable cost incurred in processing e.g. labour, firewood, water, cassava

P = price of processed cassava products.

Q = quantity of processed cassava products.

$$\text{Rate of return on investment (ROI)} = TR/TVC \tag{3}$$

The Regression Model

A multiple regression model containing a mixture of quantitative and qualitative variables was used in determining factors influencing the quantity of cassava processed. The explicit form is stated as :

$$Y = B_0 + B_1X_1 + B_2 X_2 + B_3X_3 + B_4 X_4 + B_5 X_5 + B_6X_6 + U \tag{4}$$

Where :

Y = Quantity of cassava processed products (Garri, Lafun&Fufu)

X₁ = Cost of Cassava (₦)

X₂ = Educational level of processor (years)

X₃ = Age of processor (years)

X₄ = Labour used (in man day)

X₅ = Processing technique

X₆ = Other processing cost (fire wood, transportation, frying pot, knives etc) (₦)

U = Random error

B₀ - B₆ = coefficients of parameters to be measured

RESULTS AND DISCUSSION

Socioeconomic Characteristics of Respondents

As shown in Table 1, majority (80%) of the respondents (cassava processors) were females while very few (20%) were males. This implies that women were largely involved in cassava processing. In addition, the study revealed that (56%) of the processors were married. Also, half (51%) of the processors were within the age bracket of 31 to 40 years. It can be inferred from the study that majority of the processors are still within the economic active age with an average age of 38 years. About half (48.7%) of the cassava processors had no formal education while very few (25%) having primary school education and 26.3 % had secondary education.

41% of the cassava processors belong to cassava processing association. followed by 31% belonging to co-operatives and very few (11 %) belong to community association where (48%) of the cassava processors received between 31,000 and 40,000 naira from the co-operative society while very few (16%) received above 60,000 naira. These imply that the processors are faced with financial constraints to support their processing activities.

Majority (76%) of the processors were involved in full time processing of cassava into various products while very few (24 percent) process cassava as a part- time activity. This implies that cassava processors dominate the study area due to the concentration of cassava production, with major cassava product being fufu. Majority (76%) of the cassava processors embark on traditional method of processing while very few (24%) use modern method of processing. Insufficient fund constitute the major constraint to cassava processing (38%) followed by transportation problem (25%) and distance to market (24%).

Table 1: Socioeconomic Characteristics of Cassava processors

Variables	Frequency	Percentage
Age		
20-30	7	8.8
31-40	41	51.3
41-50	21	26.2
51-60	11	13.8
Average age = 38 years.		
Sex		
Male	16	20.0
Female	64	80.0
Marital Status		
Single	13	16.3
Married	45	56.2
Divorced	9	11.3
Widow	13	16.2
Educational level		
No formal education	39	48.7
Primary	20	25.0
Secondary	21	26.3
Household size		
1-4	18	22.5
5-8	44	55.0
9-12	18	22.5
Average household size =7		
Type of social group		
Co-operative	16	31.3
Religious association	8	15.7
Community association	6	11.8
Cassava processing association	21	41.2
Amount received (in naira)		
20,000-30,000	19	23.7
31,000-40,000	38	47.6
41,000-50,000	5	6.2
51,000-60,000	5	6.2
>60,000	13	16.3
Average amount ₦ 38,000		
Processing period		
Full time	61	76.3
Part time	19	23.7
Processed cassava products		
Gari	19	23.7
Lafun	6	7.5
Fufu	31	38.7
Gari and Lafun	4	5.0
Gari and Fufu	10	12.5
Lafun and Fufu	3	3.8
Gari,Lafun and Fufu	7	8.8
Processing method		
Traditional	61	76.3
Modern	19	23.7
Constraints to cassava processing		
Insufficient fund	30	37.5
Distance to market	19	23.7
Transportation	20	25.0
Unstable market price	11	13.8
Total	80	100

Source: Computed from field data survey 2014.

Result of regression models

The three functional forms adequately characterized the empirical data as indicated by the value of co-efficient of multiple determinations (R^2). The R^2 from the linear functions show that 64%, of the variation in the quantity of cassava processed products are explained by the explanatory variables included in the table.

Therefore, out of all the estimated functional forms, the linear model was selected as the lead equation and it is presented below:

$$Y = 2.80^{***} - 1.058X_1^{***} - 0.004X_2 - 0.325X_3^{**} + 8.48X_4^{***} + 1.55X_5^* + 2.65X_6^{**}$$

The result of the lead equation revealed that cost of cassava tubers, age, labour, processing technique and other factors were significant variables affecting cassava processing in the study area. They were significant at different levels and they conformed with *a priori* expectations. Age, negatively influenced cassava output which implies that, the older the processor become, the lesser active they are in processing which reduce their productivity probably due to law of diminishing returns. Labour use positively influence output of processed cassava products which implies that the more the labour use, the more the output.

Table 2: Result of Ordinary Least Square Multiple Regression Analysis

Functional forms	b ₀	b ₁	b ₂	b ₃	b ₄	b ₅	b ₆	R ²
Linear form (t- values)	2.80*** (3.25)	-1.058*** (-25.658)	-0.004 (-0.24)	-0.325** (-2.16)	8.48*** (4.075)	1.55* (1.61)	2.65** (2.07)	0.640

Source: Computed from field survey, 2014.

*** Significant at 1% ,** Significant at 5% ,* Significant at 10%

Gross margin analysis

Table 3 shows the cost items, that are involved in cassava processing and the revenue (income) as well as profit accruable to cassava processing in Yewa South local government area. From the table, the mean gross margin per processor per month was ₦39,729 while the mean total variable cost ₦38,007.21 and average total ₦77,736.88. Rate of Return on Investment was 2.00, that is, for every one naira invested, it gives a return of same ₦1, this implies that cassava processing was profitable in the study area.

Table 3: Result of Gross Margin Analysis

Variables	Amount ₦	% of variable cost
Total Revenue	77,736.88	
Variable Cost		
Transportation	6,345.40	16.74
Cost of cassava tubers	21,416.39	56.50
Labour cost	4,545.40	11.95
Other processing costs (grating, peeling, firewood etc)	5,600.00	14.77
Total Variable Cost	37,907.19	100.00
Total Fixed Cost (Basket, Knives, Stirring pot, Basins, Sacks, Sieves, Turning sticks)	15,302.17	
Total Cost	53,209.36	
Gross Margin	39,829.69	
Net Profit	24,527.52	

CONCLUSION AND RECOMMENDATIONS

The study was carried out in Yewa South local government area to examine processing activities of cassava. Majority of the processors were into fufu processing and had no formal education. Transportation and insufficient funds were some of the problems militating against higher output as well as high cost of cassava tubers. The regression analysis revealed that cost of cassava tubers negatively influenced the output, that is, processed cassava products which means that the higher the cost of cassava tubers, the lesser the output of cassava products. Also, age of processors, amount of labour use, processing technique and processing costs are independent variables affecting the quantity of processed cassava products. The gross margin analysis revealed that the mean gross margin per processor per month is ₦39,729 while the mean total variable cost is ₦38,007.21 and average total revenue is ₦77,736.88. Inadequate capital and storage facility, cost of labour among others were problems faced by processors in the study area. It is therefore recommended that:

- agricultural extension agencies should intensify efforts in disseminating improved processing technologies to processors especially women so as to reduce problems faced during the processing.
- government through extension agents should encourage the processors to form themselves into virile cooperative and other recognized formal groups for purpose of obtaining loan.
- modern technique of processing should be introduced to the processors in order to enhance more returns to scale either by Non-government organizations or governments

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