

## Economic Analysis of Cassava Processing into Gari in Ogo Oluwa Local Government Area of Oyo State Nigeria

<sup>1</sup>J.O. Amao <sup>1</sup>O.I Adesiyun and <sup>2</sup>B.A. Salako

<sup>1</sup>Department of Agricultural Economics and Extension, Ladoké Akintola,  
University of Technology, Ogbomoso, Oyo State, Nigeria

<sup>2</sup>Department of Agricultural Economics and Farm Management,  
University of Agriculture, Abeokuta, Nigeria

**Abstract:** In this study an attempt was made to study the economic analysis of Cassava Processing into gari in Ogo Oluwa Local Government Area of Oyo State. A total of 30 processors were selected using multistage sampling technique. Average sampled gari processor were literate with considerable experience in gari processing, most of them were female and married with considerable experience. Costs and return analysis showed that gari Processing is Profitable and Lucrative. Socio-economic characteristics such as age, marital status, level of education and year of experience had positive relation with the profit made by the processors. Religions, sex, family size had inverse relationship with the project. Processors faced some constraints, such as inadequate raw materials, credit facilities, poor road network and unavailability of labour.

**Key words:** Economic analysis, cassava processing into gari, processors, raw materials, credit facilities

### INTRODUCTION

Cassava (*Manihot esculenta*) has been the most important food crop, grown in tropical Africa for Centuries. In view of the efficient Production of food energy, year round availability tolerance to extreme stress conditions and suitability for peasant farming and food system in Africa. Cassava is known to be playing a major role in efforts to alleviate the Africa food crisis, FAO (1996).

As part of total demand is concerned, the gross income elasticity of Cassava is at Present offset by a population growth rate of between 2.5 and 3.5% annually in Africa (IITA, 1994).

In Nigeria, Cassava has assumed a permanent role as one of the major staple food crops, not only among the rural dwellers but also the urban dwellers. As a result of high demand generated from the major products, gari and fufu, cassava now plays a vital role in crop combination of most farmers. Although a popularly held view support than an unbridled consumption of cassava leads to Kwashiorkor and host of other nutritional shortcomings. Consumers will stick to this root crop because it is comparatively cheaper and most variable compared to other carbohydrates (IITA, 1994).

Fresh roots can be sliced thinly and deep fried to make a product similar to potato chips. They can be cut into larger spear like pieces and processed into a product

similar to fresh fries. Roots can be peeled grated and washed with water to extract the starch, which can be used to make bread crackers, parts and peels of tapioca (Cock, 1998). Nigeria spent about 1.8 million in 1986 importing cassava starch to supplement the one produced in the country. Cassava starch can also produce crystalline glucose, which also serves as a new material to both Pharmaceutical and confectioning industries (Hahn, 1990).

Some quantity of alcohol is also extracted from cassava. Development of alcohol programme will create new opportunities for cassava growers and lead to greater employment and wealth in the suburban areas. In Nigeria the estimated demand for industrial starches derivable from cassava is of the order 6,000 tonnes per annum with 20% extraction rate (Hussein, 1986).

In Nigeria cassava is the most common food item in general 69-80% of the average daily bulk of diet of a Nigerian is made of starchy food. Cassava alone makes up of about 45-55% of the bulk and provides an average of 347 calories daily for each individual (FAO, 1995).

Whether cassava can be relied on as a low cost staple food in Urban Centres and as a source of steady real income for rural households will depend upon how well it can be processed into a safe form (Bokanga, 1995) and how far it can be presented to Urban Consumers in an attractive form at price which are competitive with those of cereal and yam (Berry, 1993).

The main objective of the study is to analyse the economics of cassava processing into gari in Ogo Oluwa local government area of Oyo State.

The specific objectives are:

- Examine the socio-economic characteristics of cassava processors in the study area
- Determine the profitability of engaging in gari processing
- Determine the effect of socio-economic characteristics on the profitability level of the processors
- Identify the constraints encountered by the processors

### HYPOTHESIS

**H<sub>0</sub>:** There is no significant relationship between the socio-economic characteristics and processors profitability level.

### MATERIALS AND METHODS

The study was carried out in Ogo-oluwa Local Government Area of Oyo State, Nigeria. The area is located at the north-east of Oyo State. It lies between latitude 6°N and longitude 4°E of the Greenwich meridian. Important villages in the area includes, Ajaawa, (headquarter of the Local Government Area). Ojutaye, Ayede, Odooba, Iwoate, Idewure, Aiyetoro Lagbedu, Otamakun and Opete.

The main occupation of the inhabitant is arable farming, tree crop farming, livestock also plays an important role. The data was collected with the aid of interview schedule. Multistage sampling technique was used in selecting the respondent from the study area. Eighty respondents were chosen randomly from eight different villages, which are Ajaawa, Odooba, Ojutaye, Otamakun, Opete, Lagbedu, Ayede and Iwoate (i.e., 10 respondents per village). Descriptive statistics, gross margin and regression analysis were used for the analysis.

**Gross margin analysis:** This was used to determine the costs and return involved in cassava processing.

The fixed cost, variable cost, total variable cost, total fixed cost, total cost, total revenue and profit were used for the study.

TFC = Summation of all fixed cost

TVC = Summation of all variable cost

TR = Total Amount realized on the produced

GM = TR – TC

Where

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

TFC = Total Fixed Cost

$\pi$  = GM-TFC

$\pi$  = Profit

### REGRESSIVE ANALYSIS

This was used to determine the effect of socio-economic characteristics on the profitability level of the processors.

$$Y = F(x_1, x_2, x_3, x_4, x_5, x_6, x_7, e)$$

where,

y = Profit (N)

x<sub>1</sub> = Age (years)

x<sub>2</sub> = Marital status

x<sub>3</sub> = Religion

x<sub>4</sub> = Sex

x<sub>5</sub> = Level of education.

x<sub>6</sub> = Household size

x<sub>7</sub> = Year of experience

e = error term

### MODEL SPECIFICATION

The relationship between the endogenous and each of the exogenous. Variables were examined using four functional forms.

Linear, Semi-log, experimental and double log

Linear  $Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 x_7 + e$

Semi-log  $Y = b_0 + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 + b_4 \log x_4 + b_5 \log x_5 + b_6 \log x_6 + b_7 \log x_7 + e$

Exponential  $\log Y = b_0 + b_1 x_1 + b_2 x_2 + b_3 x_3 + b_4 x_4 + b_5 x_5 + b_6 x_6 + b_7 x_7 + e$

Double log  $\log Y = b_0 + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 + b_4 \log x_4 + b_5 \log x_5 + b_6 \log x_6 + b_7 \log x_7 + \log e$

The lead equation called the best linear Unbiased estimate functioned form was chosen based on statistic significance, the economic theory that support production function concepts and a priori expectation of the variables.

### RESULTS AND DISCUSSION

Age Distribution of Cassava Processors: Table 1 shows that 82.5% of the processors fell within the age range of 21-50 years. While about 15% were less than 20 years and 2.5% were of the age greater than 50years. With the above it shows that most of the processors are young and very active and hence contribute to higher productivity.

**Sex of the respondent:** The result shows that 88.75% of women were involved in gari Processing. This could be as a result of the fact that men are more involved in production rather than processing (Table 1).

**Marital status of the respondent:** From Table 1, about 62.5% of the processors are married while 33.75% are single. This means that most of the processors have dependents and were more responsible giving the opportunity of using family labour.

**Level of education of the respondents:** Table 1, revealed that 75% of the Processors were educated, while 25% of them were not educated. With this high level of educated Processors adoption of a new Innovation, will be easier and hence enhance higher Productivity.

**Years of experience:** About 50% of the processors, here spent between 1-4years in the business, while 31.5% have spent between 5-8years and about 18.15% spent between 9-12 years. This means that processing as a business does not really go far a longer period of time due to the stress experienced by the respondents, of which they have in the business for a period of 5 years.

Table 1: Percentage distribution of age

Age	Frequency	(%)
11-12	12	15.00
21-30	15	18.75
31-40	24	30.00
41-50	27	33.75
51-60	2	2.50
Total	80	100
Sex		
Male	9	11.25
Female	71	88.75
Total	80	100
Marital status		
Married	50	62.50
Single	27	33.75
Divorced	-	-
Widowed	3	3.75
Total	80	100
Level of education		
No education	20	25.00
Primary	32	40.00
Education		
Secondary education	24	30.00
Tertiary education	4	5.00
Total	80	100
Year of experience		
1-4	40	50
5-8	25	31.25
9-12	15	18.75
Total	80	100.00
Household size		
0-4	19	23.75
5-9	47	58.75
10-14	14	17.5
Household size	80	100

Source: Field survey 2003

**Household size of respondents:** About 82.5% of the processors had a household size between 1-2 while the average household size of the procession is 6. This means that, the children can be of assistance in the processing of gari, this is explained by the labour type used by the processors as 65% of the processors used the family labour.

## PROFITABILITY OF GARI PROCESSING

From Table 2, it was shown that about 68.75% of the respondents agreed that gari processing is profitable, while 31.25% did not respond to the question. It could be said that with improved technology, gari processing will be more of a profitable venture than what it used to be.

**Fixed cost incurred in gari processing:** From the Table 3 it shows that the fixed cost involved is ₦11,540 per respondent.

**Variable cost:** Table 4 has it that the total variable cost involved in gari Processing per respondents is ₦5,840

Table 2: Percentage distribution of gari profitability

Profitability	Frequency	(%)
Profitable	55	68.75
Not Profitable	-	-
No response	25	31.25
Total	80	100

Source: Field survey 2003

Table 3: Fixed cost incurred in gari processing

Items	Life span (years)	Cost (₦)	Depreciation
Hut	3	5000	1666.6
Tripod	2	1000	500
Fryer	4	3000	750
Sieve	2	500	250
Basket	2	1000	500
Knives	2	400	200
Tossing calabash	2	140	70
Sacks	2	500	250
Total	19	11,540	4,186.60

Source: Field survey 2003

Table 4: Variable cost incurred in gari processing

Items	Cost (₦)
Cassava set	3,500
Peeling	600
Grinding	500
Sieving	500
Frying	600
Bagging	140
Total	5,840

Source: Field survey 2003

Table 5: Gross margin principle of cassava processing enterprise

Total fixed cost	Total variable cost	Total revenue	Gross margin	Profit II
4,186.60	5840	13,200	7,360	3172.40

**Gross margin of cassava processing enterprise:** The data in Table 5 was used to calculate the gross margin, hence the profit made from cassava processing.

$$\begin{aligned}
 \text{Total revenue} &= \text{Selling price} \times \text{Quantity produced} \\
 &= P \times q \\
 &= 10 \text{ ₦}1,320 \\
 &= \text{₦}13,200 \\
 \text{GM} &= \text{TR} - \text{TVC} \\
 &= \text{₦}(13,200 - 5,840) \\
 &= \text{₦}7,360 \\
 \pi &= \text{GM} - \text{TFC} \\
 &= 7360 - 4186.60 \\
 \pi &= \text{₦}3,173.40/\text{bag}
 \end{aligned}$$

### REGRESSION ANALYSIS

The simple regression analysis was used to examine the effect of independence variable  $x$  on the dependent variable  $Y$ , this was chosen as a lead equation or best fine tuned form based on the statistical Criteria such as the  $R^2$  value, number of the regression coefficient that are statistically significant with the right sign and value of F-ratio. By considering the fine tuned form, the following results were obtained as revealed in Table 6.

The linear equation showed the relationship between the profit earned by the gari processor and some of the selected socio-economic characteristics of the respondents that is  $x_1$  (age),  $x_2$  (Marital status),  $x_3$  (Religion),  $x_4$  (Sex),  $x_5$  (Level of Education),  $x_6$  (Household size),  $x_7$  (years of experience) while profit is expressed as  $y$ .

Coefficient of age, marital status, level of education and year of experience of gari processor, showed a positive relationship meaning that they have direct effect on the profit of the respondents while the coefficient of  $x_3$  (Religion) and  $x_6$  (Household size) were negative meaning that they have no effect on the profit of the processions.

Marital status ( $x_2$ ), Sex ( $x_4$ ), household size ( $x_6$ ) and year of experience were significant at 1% level of significance, while level of education ( $x_5$ ) is significant level and age ( $x_1$ ) is not significant at any level of significant considered. This means that there is no relationship between the age and the profit gained by the processions.

The coefficient of determination ( $R^2$ ) of the linear regression is 0.660; this indicates that about 66% of the variation in the profit of the gari processors could be explained by the independent variables. While the unexplained variables of about 34% can be attributed to those variables not considered in the model i.e., error term.

Table 6: Regression result of cassava processing in ogo-oluwa local government area of Oyo State

Predictor	Estimated parameter	Standard error	T-ratio
Constant	10576.23	-	-
$x_1$ (age)	179.15	177.53765	0.991
$x_2$ (Marital status)	1052.40	5062.44	4.81*
$x_3$ (Religion)	-1030.38	-3203.451	3.109
$x_4$ (sex)	-5701.98	46425.521	-8.142
$x_5$ (Level of education)	120.92	146.550	1.212**
$x_6$ (Household size)	-867.13	4853.466	-5.528**
$x_7$ (year of experience)	150.18	15.1681	0.101*

Source: Field survey 2003, \* Significant at 1% level, \*\* Significant at 5% level,  $R = 0.812$ ,  $R^2 = 0.660$ ,  $F = 17.146$

Table 7: Percentage distribution of problems encountered by the respondents

Problem	Frequency	(%)
Finance	5	6.25
Raw material	3	3.75
Transport and labour	4	5.00
Labour and finance	5	6.25
Raw material labour and transport	33	41.25
Finance and raw material	30	37.50
Total	80	100.0

Source: Field survey 2003

From the discussion, the coefficient of  $x_2$  is positive and significant this means that marital status had an effect on the profit generated by the respondents. The coefficient of  $x_4$  (sex) is also significant but negative, this is because of the job been attributed to women. Also the level of education is significant meaning that education is a good contributor to the processing activities because this will help to adopt new innovations in carrying out their processing activities. Household size is negative but significant, this means that household size had no effect in the gari processing because the respondents have children who can help them in the gari processing activities that is serving as a family labour thereby increasing production and income. Also the years of experience had an effect because the higher the experience, the lower the risk encountered in the processing of gari and the higher the profit. Based on the findings, there is significant relationship between the profit earned by the gari processors and their socio-economic characteristics i.e., level of education, marital status, age and household size.

### PROBLEMS ENCOUNTERED BY PROCESSING

Table 7 revealed that most of the processors encountered problems of raw materials availability and finance that is 37.50%, 41.25% encountered problem of raw materials, 6.25% encountered problem of finance, 3.75% encountered problem of raw materials, 6.25% face problem of labour and finance while about 5% was hindered by the problem of transport and labour.

## CONCLUSION

A large proportion (78.75%) of the respondents were female, this is due to the nature of the job, which is mainly associated with female. Majority of them were still in their productive years i.e., 63.75% of the respondent falls between the ages of 30-50% years.

A substantial percentage of the processors were married (62.5%) and higher percentage of them have one form of education or the other (totaling 75%). About 50% of them were exposed to the gari processing activities for at least 5 years.

The problems encountered by the gari processors ranges between financial, raw material and labour availability as revealed by the respondents. Most of the processors have a large household size and in essence, involving them in family labour, thereby increasing their production and profit at the end of the whole processing activity.

The budgetary analysis showed that gari processing is highly profitable, also from the study, it was realized that price of gari was not stable with an increment of about 10% from the normal price especially during the festival period.

Regression analysis revealed that there is a significant relation between the profits realized by the gari processors and some of the selected socio-economic characteristics that is sex, age, education marital status, years of experience of gari processors.

In conclusion the result of the analysis showed that profitability of gari depends on some of the selected socio-economic characteristics of the processors. It therefore supports that sex, years of experience, marital status and household size of the processors can significantly affect the profit realized by the gari processors.

## RECOMMENDATION

Based on the result obtained in the study, the following recommendations were made

- On the part of the processors, they should be able to combine hired labour and family labour during processing to improve their productivity.
- For higher productivity, funds should be given through cooperative societies and community banks and micro finance institutions.
- There is a need for community based programme towards ensuring the availability of raw materials.
- Improved technologies should be embarked upon, by providing the processors either by government or some concerned Non- Governmental Organizations.

## REFERENCES

- Berry, S.A., 1993. Socio-economic aspects of Cassava cultivation and use; Implication for the development of appropriate technology COSCA working paper collaborative study of Cassava in Africa IITA Ibadan, pp: 138
- Bokanga, M., 1995. Cassava Fermentation and Industrialization of Cassava Food Production Proceeding of the Fourth, Technical Symposium of the International Society for Tropical Root Crops-Africa Branch, Kinsha; Is TFC-AB, IITA Ibadan, pp: 102.
- Cock, J.H., 1998. Cassava, New Potential for a Neglected Crop, IADS Development; Oriented literature series West-view Press, Bogota, pp: 50-52.
- FAO, 1955. Production Year Book FAO, Rome Italy, Trade Year Book-FAO, Rome Italy, pp: 15-17.
- FAO, 1996. Food and Nutrition Paper (g), pp: 20-21.
- Hahn, S.K., 1990. An Overview of Africa Traditional Cassava Processing and Utilization, pp: 60-63.
- Hussein, J.I., 1986. Storage and Preservation of Food Development of post harvest system and Food security in West Africa, pp: 40-42.
- IITA, 1994. International Institute of Tropical Agriculture, the Prospect for low Cyneade varieties in Nigeria, pp: 162.
- Mamor, E.I., 1993. Journal of Cassava Utility and Efficiency, pp: 20-23.