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Research Paper

Economics of Processed Cassava Products in Imo State, Nigeria

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ABSTRACT: *This study evaluated the economics of processed cassava products in Imo State, Nigeria. Multi-stage random sampling technique was used to select 106 cassava processors for this study. Information on the objectives of this study was elicited from the sampled respondents through a well structured questionnaire. Data were analyzed using descriptive statistics such as the mean, analyses of variance and net returns model. The socio-economic features of the farmers reveals a mean age of 54 years, 4 persons per household, 7 years educational attainment, 16 years of processing experience and a business size of ₦4,531. The result of the analysis of variance showed no significant differences in net returns of processed cassava products across the three agricultural zones of the State. Hence, Okigwe and Owerri zone recorded the highest net returns in garri and fufu processing respectively showing the profitability of the enterprise. However there is urgent need for the government to assist the rural cassava processors by providing direct extension services to cushion the processing inefficiencies faced by these farmers in the area.*

Keywords: *Economics, Processed, Cassava Products, Net-returns, Imo State*

I. INTRODUCTION

Cassava (*Manihot esculenta Crantz*) originated from Brazil and now is widely cultivated mainly in the tropic and sub-tropic regions of the world, over a wide range of environmental and soil conditions (Onyenwoke and Simonyan, 2014). Cassava is very tolerant of drought and heat stress and produces well on marginal soils. It is an important dietary staple in many countries within the tropical regions of the world where it provides food for more than 800 million people (FAO, 2013). As a subsistence crop, cassava is the third most important carbohydrate food source in the tropics after rice and maize, providing more than 60% of the daily calorific needs of the populations in tropical Africa and Central America (El-Sharkawy, 2003). According to Adeniji *et al.* (2011), cassava plays an important role in alleviating food problems, because it thrives and produces stable yields under conditions in which other crops fail.

Cassava processing is simply the act of transforming freshly harvested cassava product into a finished product. For instance, with improved processing technology, raw cassava can be transformed into industrial products of international standard (Adepoju and Nwangwu, 2010). Processed products can be classified into primary and secondary products. The former, e.g. *garri, fufu, starch, chips, tapioca, akara-akpu, pellets*, etc are primary products which are obtained directly from raw cassava roots, while the latter are obtained from further processing of primary products (e.g. glucose syrup, dextrin, and adhesive are obtained from starch) (Akinwale *et al.* 2010). Cassava processing activities are widespread in Nigeria's rural areas, being the most formally processed crop in the Southern and Middle Belt areas of the Country. The economic livelihood of many Nigerians in the South-east and South-south and Middle-belt depended on the crop. Cassava, in its processed form, is a reliable and convenient source of food for tens of millions of rural and urban dwellers in Nigeria (IITA, 2012).

The low income nature of the developing countries compels the processing of agricultural produce into primary foods which have a number of competing alternatives, and so the value added benefits of rural processing continues to be variable and marginal. This in turn, seems to perpetuate their poverty levels (Osunde and Fadeyibi, 2011). Hence, it is believed that the presidential initiatives on cassava crop should be implemented through massive campaign on the various economic uses of cassava which include the processing of cassava into high quality cassava flour for use in bakeries and pastries. This measure will ensure

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increased production, processing, packaging and export of cassava products to satisfy domestic and export markets" as well as address the low income nature of the rural farmers (IITA, 2011).

II. MATERIALS AND METHOD

This study was carried out in Imo State, Nigeria. The state is located in the South-Eastern rainforest belt of Nigeria. Imo State has a total of 27 Local Government Areas which is divided into 3 Agricultural Zones namely; Owerri, Orlu and Okigwe. Across these zones, agriculture is a major economic activity predominant amongst the people of the State. A multi-stage sampling technique was employed in selecting the respondents. This was to enable the survey cover the entire State. In the first stage, two local government areas were purposively selected from each of the three Agricultural Zones of Owerri, Orlu and Okigwe respectively. The areas selected are noted for their predominant agricultural activities especially on cassava production. The Local Government Areas are Aboh Mbaise and Ohaji-Egbema for Owerri Zone, Nwangele and Isu for Orlu Zone while Isiala Mbano and Obowo were selected from Okigwe Zone, thereby giving a total of six Local Government Areas. Secondly, from each of the Local Government Areas, two (2) Autonomous Communities were selected making a total of 12 communities, and finally, ten (10) cassava processors were randomly selected from each community to give a total of 120 processors. Data for this study were collected through primary sources using a set of structured questionnaire. From the administered questionnaire, 106 were found useful for data analysis. Data were analyzed using descriptive statistics, analysis of variance and net returns model. Socio-economic characteristics of the farmers were analyzed using descriptive statistics such as the mean. The resultant net incomes in the 3 agricultural zones were tested for significant differences using analysis of variance (ANOVA) techniques; specified below:

$$F = \frac{MSSB}{MSSW} = \frac{SSB/(n-k)}{SSW/(k-1)} \text{ -----} \quad \text{eqn. 1}$$

$$SSB = \sum_{J=1}^{k} nj\,(\overline{X} - \overline{\overline{X}})^2 \text{ ------} \quad \text{eqn. 2}$$

$$SSW = \sum_{I=1}^{nj} \sum_{J=1}^{k} (Xij - \overline{Xj}) \text{---------} \quad \text{eqn. 3}$$

$$SST = SSB + SSW \text{ -------} \quad \text{eqn.4}$$

Where:

F = Value of which the statistical significance of the mean difference will be judged

SSB =Sum of square deviations between the net returns of processed cassava products in the three agricultural zones

SSW=Sum of squares deviations within the mean net returns of processed cassava products in the three agricultural zones

SST =Total sum of squares of the net returns of processed cassava products in the three agricultural zones

$\overline{Xj}$ = Mean level of net returns of processed cassava products from agricultural Zone J

$\overline{\overline{X}}$ = Grand mean level of net returns of processed cassava products

$\overline{Xij}$ = ith level of net returns of processed cassava products from agricultural zone J

nj = Sample size of processors from agricultural zone J

n = Number of observations in the three agricultural zones

k = Number of agricultural zones in the State.

The net return model is generally specified as follows;

NR = TR – TC ------ eqn. 5

Where:

NR = Net return (in Naira)

TR = Total Revenue (in Naira)

TC = Total Cost (TVC +TFC) (in Naira)

III. RESULTS AND DISCUSSION

Socio-Economic Characteristics of Cassava Processors in the Area

Table 1: Distribution of Respondents According to Socio-Economic Characteristics

Variable	**Mean**
Age (years)	54
Household size (No. of persons)	4
Level of Education (No of years)	7.4
Processing experience (years)	16
Business size (₦/yr)	4531

Source: Field survey, 2013.

Table 1: showed that the mean age of the cassava processors was 54 years. This implies that majority of the processors were middle aged people, hence at this age, farmers are in the right frame of mind to take critical decisions concerning their enterprise. This is consistent with the findings of (Osuji *et al.* 2012). The mean household size was 4 persons. This shows that the cassava processors had probably reasonable farm hands that could help in cassava processing. This is consistent with the findings of (Ibekwe *et. al.* 2012). The mean level of education is 7.4. This implies that the processors were relatively educated. According to Ejike and Osuji, (2013) there exists a positive relationship between education and adoption of new processing innovation. Education is an investment in human capital which is able to raise the processing skill of the cassava processors.

The mean years of processing experience was 16 years. This implies that the cassava processors are well experienced and knowledgeable in cassava production and processing (Yakasai, 2010). Also, the mean business size of the cassava processors were ₦4,531. This implies that most of the processors in the study area are small and medium scale processors who process for sale in the local markets and for consumption (Westby, 2008).

Analysis of Variance: Test of Significant Differences in Net Returns of Processed Cassava Products across the Three Agricultural Zones of Imo State

Table 2: Results of Analysis of Variance for test of Significant Differences in Net Returns of Processed Cassava Products across the Three Agricultural Zones of Imo State

Sources of Variation	**SS**	Df	MS	f-cal	f-tab
Between groups	36039	2	18019.5	0.697^{ns}	3.07
Within groups	2660968	103	25834.6		
Total	**2697007**	**105**			

Source: field survey, 2013. ns = f-cal not significant at 5%
f 0.05 = 3.07

The results in Table 2; showed that the ANOVA model produced f-cal value of 0.697 which was not significant at 5% when compared with the f-critical value of 3.07, which implies that there are no significant differences in net returns of processed cassava products across the three agricultural zones of Imo State. This stems from the fact that, the net returns across the three agricultural zones studied are infinitesimal. It can be further concluded that the net returns of processed cassava products across the three agricultural zones of Imo State are statistically equal. Therefore, hypothesis I was accepted. This is consistent with the findings of Osuji, (2011).

Net Returns of Processed Cassava Products across the three Agricultural Zones of Imo State

Table 3: Estimated Net Returns of Processed Cassava Products across the three Agricultural Zones

Item		**Value (₦/processor/year)**	
Processed Cassava Products	Orlu	Owerri	Okigwe
GARRI			
Total revenue	92,700	98,025	94,100
Total cost	22,114.10	28,620	23,239.6
Net Returns	70,586.00	69,405.00	70, 860.4
FUFU			
Total revenue	79,100	85,200	75,700
Total cost	15,894.0	13,660.10	13,913.20
Net Returns	63,206	71,539.90	61,786.80

TAPIOCA			
Total revenue	35,000	34,050	30,040
Total cost	6,930.4	7,215.7	6,570.7
Net Returns	28,070	26,834.3	23,469.3
AKARA-AKPU			
Total revenue	20,070	19,200	22,450
Total cost	4,851.4	4,651	5,805.2
Net Returns	15, 218.6	14,548.9	16,644.8
STARCH			
Total revenue	8,700	7,170	10,250
Total cost	1,166.4	2,265.7	2,585.3
Net Returns	7,5 33.6	4,904.5	7,664.7

Source: field survey, 2013

Table 3: showed the result of net returns of processed cassava products across the three agricultural zones State. It could be deduced from the result that Okigwe zone recorded the highest net returns of ₦70,860.4 in garri processing which varies proportionately with the net returns recorded in Orlu and Owerri zones respectively. Seemingly, Owerri zone had the highest total revenue, ₦85,200 in fufu processing which apparently led to a higher net returns of ₦71,539.90 relative to other zones. The above results imply that *garri and fufu* processing is a viable and profitable enterprise across the various zones of State and need to be encouraged (Westby, 2008). However, *tapioca* processing recorded very low total revenue and net returns across the various zones of the State. This implies that tapioca processing is not a viable enterprise; few people are also into the business. This might be due to its low demand in the market. Similarly, other processed cassava products such as *akara-akpu* and *starch* recorded a low total revenue and net returns across the three agricultural zones State. This further implies that the business is not a profitable one probably due to low patronage of the enterprise (Adepoju and Nwangwu, 2010).

IV. CONCLUSION AND RECOMMENDATIONS

The findings of the study showed that cassava (*Manihot esculenta Crantz*) can be processed into various forms such as *garri, fufu, tapiaoca, akara-akpu and starch*, which accrue more income than when sold in raw forms. Moreover, cassava processing creates employment opportunities for both the old and young who are involved at different stages of processing. Hence, there is urgent need for the government and other relevant stakeholders to assist the cassava processors by providing highly technical extension services to cushion processing inefficiencies so as to boost net returns across the zones.

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