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Income Elasticity from Small Scale Cassava Processing Activities in Surulere Local Government Area, Ogbomoso, Oyo State, Nigeria

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Abstract:

Cassava is one of the most important cash crops which are grown in tropical and sub-tropical areas of the world. Cassava is economic plant because it is mostly grown on small farms and it does not require any foreign made equipment or instrument. The price of cassava products is unstable depending on the market demand each year.

Hence, the focus of this project is on determinants of income from small scale cassava processing activities in Surulere local government area Ogbomoso Oyo, State. Multistage random sampling was used to select respondents for the study. First stage was the purposeful selection of Surulere Local Government. Second stage was the random selection of ten Villages in the Local Government Area. The third and final stage is the random and proportionate selection of respondents, who are into cassava processing. In all 100 respondents processor were selected. The result shows that majority of the processors are in the 51-60 age group. This indicates that most of those who engage in cassava processing activities are in the active phase of their lives. Most of the respondents were illiterate (61.8%) and would not be able to make good use of extension information effectiveness. Also, majority of the respondents were married (98%) and assistance will come from their spouses but at the same time responsibilities will be increased and will reduce the processors effectiveness. The regression results reveal that the coefficient of the multiple determinations (R^2) is 73%. In all this study reveals that initial capital, labour cost literacy levels are the major factors determining income from the small scale cassava processor. On the contrary the older a processor are the less productive they become.

Keywords: *Gross margin, small scale, and cassava processor*

1. Introduction

Nigeria is the world largest cassava producing country in the world with about 45.75 metric tonnes annually FAO, (2007). Cassava is a cheap and reliable source of food for more than 700 million people in the developing world (FAO, (2003). It is estimated that 250 million people in sub-Saharan Africa derive half of their daily calories from cassava FAO, (2005).

Pakpahan and Gunawan, (1992) reported that Cassava (*Manihotesculenta*) is a woody plant with a height between 1-3m, and most parts of the plant can be used for food and industrial purposes whether in small hold Agricultural system or developing Nations. However, there are numbers of drawbacks which includes technical, financial, institutional and infrastructural support which has adversely affected the economic wellbeing of most small hold farming families and has resulted in the continuous marginalization of the rural space in which cassava farming take place. According to Mougeot and Levens, (1990), introduced in the 1650s with imported roots from Mexico, cassava has acquired a significant place in the agricultural system of South-East Asia. In many developing countries, cassava is thinly traded and or traded informally. The lack of established market information has been among the main factors constraining trade in cassava FAO and IFAD, (2000). The most commonly identified bottle neck to develop cassava market opportunities was the lack of good planting material, lack of equipment's mechanization and power were also mentioned on several occasion as bottlenecks to developing the industry.

Some less frequently mentioned constraints but perhaps as important as those above are infrastructure, consumers acceptance, education, and training of key actors in the industry and good weather for drying cassava IFAD and FAO, (2004). These bottlenecks have negative impact on the employment generation and income earning potentials of the agricultural sector as well as the sectors capacity to serve as the pivot for the drive to reduce poverty in the land. More

importantly the capacity of the sector to continue to meet the food needs of the nation in the form that people require is also seriously mentioned.

Every nation attempts to address the prevalent issue of food security. In Nigeria, Agriculture provides food for the teeming population and contributes about 33% to the gross domestic product (GDP) of the nation (Bureau of African affairs, 2010). The sector employs about one third of total labour force and provide a livelihood for the bulk of the rural populace (FMARD, 2006). Total area devoted to agricultural cultivation is about 30.7million hectare with farmers cultivating less than 2ha averagely, operating with simple tools, the performance of the small holding farms in Nigeria is observed to be unsatisfactory. The agricultural sector of Nigeria has failed to keep pace with the demand of households and industries for the farm produce as food or raw materials (Nwaiwu *et al*, 2010). According to Food and Agricultural Organization of the United States database, FAOSTAT (2009) Nigeria is the largest producer of cassava with 45,721,000,43,410,000 and 44,582,000 million tonnes in 2006,2007 and 2008 respectively and about 90% of this is however consumed as food Awoyinka, (2009). Nigeria is yet to fully harness the socio-economic potentials of cassava that would translate to higher ranking of cassava next to petroleum as major contributor to the gross domestic product (GDP). For this to be achieve, cassava farmer's production efficiency and profit margins needs to be established thus creating a gap this study intends to fill, most especially in Surulere Local Government of Oyo State.

In Nigeria, as in most developing countries cassava is one of the most important carbohydrate sources. The large population of Nigeria depend on cassava daily as their main dish such as gari, fufu, pupuru and starch, the leaves are consumed as vegetable and it serves as raw material to industries as well as been a means of alleviating poverty. In spite of the various uses cassava is known for, as an agent of self-sufficiency in food production, the gain derive from its production by rural farmers is still not sufficient to keep the resource of poor farmers above the poverty line. Efforts aimed at increasing cassava output to meet the demand for the output cannot be properly directed unless the costs and returns of cassava production are determined. If this is done, farmers will be guided on inputs to focus on, thereby increasing profit which will in turn result to higher standard of living and increase the incomes of the farmers.

In the sub-tropical region where Nigeria is located, the availability of rain is thus critical to farming operations, continued employment and income generation among farm families. Consequently, farmers tend to be unemployed during the dry season when there is generally no rainfall. The off season period varies from three to nine months as one moves from the Southern humid tropics to the Semi-arid North. This period tend to be very critical in the lives of most agricultural households since little or no income is earned and the farm-family of need has to call on their reserved food and savings for family upkeep. This has the implications of reinforcing underemployment and poverty among farm-families and has thus resulted in farmers been the poorest economic group in the country (Aigbokhan, 2000).

It is thus, crucial to make deliberate attempt to develop strategies that will add value to the farm products to increase their shelve lives, reduce post-harvest losses and shore up the national capacity to meet the food needs of the Nigerian people. In addition, such strategies should be able to access farm families to alternative and/or complementary employment opportunities especially during the off-season period. The promotion of enterprises that can process food products at the farm-gate is thus a crucial policy instrument for solving the problems of rural unemployment/underemployment, income poverty among farm families as well as reducing food shortages in the Nation.

1.1. Reason for Processing Cassava

Fresh cassava roots cannot be stored for long because they rot within 3-4 days of harvest. They are bulky with about 70% moisture content, and therefore transportation of the tubers to urban market is difficult andclassy. The roots and leaves contain varying amounts of cyanide which is toxic to humans and animals, while the raw cassava roots and uncooked leaves are not palatable. Therefore, cassava must be processed into various forms in order to increase the shelf life of the products. The nutritional status of cassava can also be improved through fortification with other protein rich crops. Processing reduces food losses and steadies seasonal fluctuations in the supply of the crop.

1.2. Cassava Processing Income Generation Ability

Cassava can be processed into gari, fufu, cassava flour, cassava flakes, etc. Income can be generated from all cassava processed product. Also after cassava has been processed into various products as listed above, its waste can also be sold. For instance, cassava peel can be sundry and then be sold to people who will utilize it as livestock feeds and this can also serve as a source of income.

1.3. Problem Statement

In the Sub-Saharan (African) region where Nigeria is located, the availability of rain is thus critical to farming operations, continued employment and income generation among farm families. Consequently, farmers tend to be unemployed during the dry season when there is generally no rainfall. The off season period varies from three to nine months as one moves from the Southern humid tropics to the Semi-arid North. This period tend to be very critical in the lives of most agricultural households since little or no income is earned and the farm-family of need has to call on their reserved food and savings for family upkeep. This has the implications of reinforcing underemployment and poverty among farm-families and has thus resulted in farmers been the poorest economic group in the country (Aigbokhan, 2000). Several authors have carried out study on income elasticity from small scale cassava processors but none has done in in Surulere Local Government of Oyo State, Nigeria. Therefore, it is thus, crucial to make deliberate attempt to document the income elasticity of small scale cassava processors in Surulere Local Government of Oyo State, Nigeria, in order to develop strategies that will add value to the farm products to increase their shelve lives, reduce post-harvest losses and shore up

the national capacity to meet the food needs of dwellers of Surulere Local Government Area and Nigerian people as a whole.

Therefore, this study will provide answers to the following research questions.

- What are the socio-economic characteristics of cassava processors in the study area?
- What is the cost and return to cassava processing enterprise?
- What factors determine the profitability of cassava processing?

The objective of the study is to evaluate the income elasticity from small scale cassava processing activities in Surulere Local Government of Oyo State. Specifically, the study intends to: examine the socio-economic characteristic of cassava processors, analyze cost and returns of cassava processing enterprises, and determine the factors affecting the profitability of cassava processing, make policy recommendation based on the findings.

1.4. Hypothesis of the Study

- Ho₁: There is no significant relationship between socio-economic characteristics of the respondents and income from small scale cassava processing
- Ho₂: There is significant relationship between the socio-economic characteristics of respondent's income processing activities.

1.5. Justification of the Study

The significant or importance of cassava processed product as a prominent and very resourceful staple food in Nigeria can never be over emphasized. It has served as a gap bridger to satisfaction from starvation for both the rich and the poor in Nigeria. Due to the radical fall in the value of individual income, the position of cassava processed product is now taking a new rate. Most families now found it rational to consume cassava processed products because of its relatively lower price, still accompanied with a moderate satisfaction, compared to other food stuffs. The popularity of cassava processed products as a meal in Nigeria is further more improved by its ease and time saving meal preparation, most especially to the urban dwellers that usually have demanding schedules.

1.6. Conceptual Framework

Cassava processing procedures vary depending on products from simple processing (peel, boil and eat) to complicated procedures for processing into gari, for example, which involve many more steps namely peeling, grating, pressing, fermenting, sifting and roasting. Some of these steps reduce cyanide more effectively than others. Processing techniques and procedures differ with countries and localities within a country according to food cultures, environmental factors such as availability of water and fuel wood, the cassava varieties used, and the types of processing equipment and technology available. The most important traditional cooking preparations of cassava in Africa are boiled or roasted roots, "fufu" (cassava flour stirred with boiled water over a low-heat fire to give (stiff dough), "eba" (gari soaked in hot water to produce a thick paste) Conn, (1969).

1.7. Empirical Reviews

Cassava is a very important crop to Nigeria. Its relative production advantage over other staples serves to encourage its cultivation even by the resource poor farmers. The crop's production is commonly thought to require less labour per unit of output than other major staples. Cassava is able to grow and give reasonable yields in low fertile soils. It is a good staple whose cultivation if encouraged can provide the nationally required food security minimum of 2400 calories per person per day, FAO (2000).

The importance of food processing in national development is underscored by the new national policy on agriculture, which assigns two major goals for agricultural commodity processing: Processing commodities and accelerating the growth of the agricultural sector and Preservation of commodities to reduce waste and seasonal price fluctuations. The main policy strategies stipulated in the policy document include: promotion of Small and Medium Scale Enterprises (SMEs), increased participation of commercial banks and improvement in the quality, packaging and preservation of processed commodities, Mangyong, (2004).

According to FAO (2008), the development and growth of small-scale enterprises are based on the existence of some level of entrepreneurial climate or enterprise culture amongst the people. Such skills and motivations should be supported by a well-defined institutional structure that includes formal rights and protections to physical and other properties and is understood by the participants. Access to resources in the form of capital, labour and infrastructure in an agricultural economy will then lead to the development of small enterprises participating in the processing of farm products. As Reardon et al. (2001) pointed out; household members will redirect their labour away from land-based activities because of the existence of Pull factors such as higher incomes in the non-farm sector relative to the farm sector and Push factors such as increase in agricultural risk (farming that cannot ensure year-round income and consumption).

With increasing population, urbanization, growth in the economy and rise in income, Nigerians continue to demand for food in various forms. The implication of this for Nigeria is that as demand for food increases and the farm sector become modernized; a transformation of the small holder farming system also takes place. Not only are farms larger, but the modern farmer becomes an expert involved with the crop cultivation and animal breeding operations, thus transferring the functions of storing, processing and distribution of farm products as well as the supply of input and production factors to other organizations (Wilk and Fensterseifer, 2003). However, the marginalization of the rural landscape has adversely affected the attraction of entrepreneurs from outside the rural areas to invest in the downstream

sector of the farm business. Consequently, the farm families act both as producers and processors of the farm products with specialization along gender lines. While men are mostly involved in production, the women concentrated on processing and marketing of the farm produce. It is in recognition of this that the Nigeria's National Food Security Programmed has taken into consideration the issue of food processing as a major part of its component.

Federal Ministry of Agriculture and Water Resources, (FMAWR, 2008) documented the role of food processing in ensuring the availability food and price stability to achieve food security. The policy drive is to mobilize the Federal and State governments to establish modern and correctly equipped agro-industrial processing parks with the financial support of banks and microfinance institutions. In addition, government owned processing companies requiring rehabilitation are to be overhauled while financial support is to be provided small-scale processors in partnership with the financial institutions to import necessary processing machines and technologies FMAWR, (2008).

The overall aim of the strategy is to improve the processing capacity of the nation towards achieving self-sufficiency in food output. However, while the new policy direction on farm product processing is tilted towards medium to large-scale enterprises operating in the formal sector, it clearly excludes the small-scale operators in the informal sectors out of the scheme of government. This is because the scale of operation of the latter at the farm-gate does not warrant the importation of machines, yet, they constitute the main suppliers of processed food products in the local food markets. It is, therefore, important to understand the small-scale informal sector, rural based food processing enterprises and their impact on the economic wellbeing of farming households to determine the policy measures required to enhance their productivity, generate higher income and employment and contribute to the national drive to achieve food security

Conn, (1969) stated that Cassava contains the cyanogenicglucosides, linannarin and lotaustralin which are hydrolyzed after tissue damage, by the endogenous enzyme, linamarase to the corresponding cyanohydrins and further to hydrogen cyanide (HCN)(Conn 1969). The hydrogen cyanide is responsible for chronic toxicity when inadequately processed cassava products are consumed by humans and animals for prolonged periods. Therefore, traditional processing procedures must aim at reducing cyanide and improving storability, convenience and palatability.

Mahungu et al, (1987) argued that the processing procedures for wet pulp and fermented, and dried pulp production are similar except for the drying of the wet pulp will be moulded into balls 3-5cm diameter, put in boiling water and stir thoroughly to obtain a stiff wet pulp of about 0.5-1.0kg which is packed in a plastics or polyethene bag and marketed in cities in Nigeria, Ghana, Cameroon. Urban dwellers therefore do not need to buy fresh root for processing into wet pulp to prepare wet fufu.

Numford and AY, (1987) stated that Cassava is processed into smoked cassava balls in the same way as fermented and dried pulp is produced except that the fermented wet pulp is pounded and molded into round balls of about of 4-7cm in diameter, these balls are then smoked and dried on platform above the fire placed in a special structure hung above the hearth. The dark coating caused by smoke is cleaned off and the cleaned balls are milled into flours reconstitution into fufu. The study also confirmed that the roots are peeled, sliced into small pieces and sun-dried on racks or roofs for 4-5 days or sometimes up to 3 weeks, depending on the weather and the size of pieces. Later, sun-dried pieces are milled into flour. This processing system is very simple but the processed products contain considerable amounts of cyanide. This method is widely used in many areas in Africa, particularly where water supply for fermentation is seriously limited.

The essential amino acid content for cassava leaf protein is similar to that found in hen's egg and is greater than that in oat and rice grain, soybean seed, and spinach leaf. While the vitamin content of the leaves is high, the processing techniques for preparing d leaves for consumption can lead to huge losses. For example, the prolonged boiling involved in making African soups or stews, result in considerable loss of vitamin C, Yeoh and chew, (1976)

Cassava leaves from a significant part of the diets in many countries in Africa. They are used as one of the preferred vegetables in most cassava growing countries, particularly in Zaire, Congo, Gabon, Central African Republic, Angola, Sierra Leone and Liberia. The cassava leaves prepared as vegetable are called "sakasaka" or "pondu" in Zaire, Congo, Central African Republic and Sudan, "kizaka" in Angola, "Mathapa" in Mozambique, "chigwada" in Malawi, "chombo" in "Ngwada" in Zambia, "Gweri" in Cameroon. They are mostly served as a sauce which is eaten with chickwange, fufu and boiled cassava, Yeoh and chew, (1976).

Knipscheer, (2003) stated that, the future of cassava rest onvery much upon development of improved processing technologies and of improved products that can meet the varyingneeds of urban people, and on its suitability for alternative uses such as animal feeds.

2. Methodology

The study area is Surulere Local Government, Surulere is one of the 33 local government in Oyo State and it's headquarter is in Iresaadu, it is located in western part of Nigeria. It shares boundaries with Ifelodun Local Government, Orolu Local Government in Osun State, Oriire Local Government, Ogbomosho North and South Local Government, with longitude 3^o and 5^oE and latitude 7^o and 8^oN and covers an area of approximately 26,500km². The State enjoys a tropical humid climate with two climate seasons, the rainy season that prevails from April-October and the dry season that lasts from November-march. The southern part of the state is dominated by the tropical rain forest while the guinea savannah belt dominates the remaining parts Agboola, (1979).

2.1. Source and Method of Data Collection

Primary data was used in this study and was obtained through the use of structured questionnaire, and interview questions schedule to the respondents.

2.2. Sampling Procedure and Method of Data Collection

Multi-Stage random sampling technique was used to select respondents for the study. First stage is the purposeful selection Surulere Local Government because the major non- farm occupation by agricultural households in the area is food processing and also because they constitute the nucleus of cassava processing enterprises. The Second stage is the random selection of ten villages which was obtained from the information units of the Local Government Area. The list of villages/communities as compiled by the National Population Commission (NPC, 2006) was also used as complement to the ones that was obtained from the selected LGA. The final stage involved proportionate selection of ten respondents which are into cassava processing. In all 100 respondents was sampled. Variables that were tested include the socio-economic characteristics of cassava processors like age, gender, marital status, Education background, income level of respondent etc.

2.3. Econometric Model

Econometric model used in this study includes descriptive statistics, gross Margin and regression analysis.

2.4. Descriptive Statistics

This was used to determine the socio- economic characteristics of the respondents in the study area. Tools used were frequencies, percentages and mean.

2.5. Gross Margin

The gross margin estimated the difference between total revenue and total variable cost in cassava processing operation or activities as stated in equation(1).

$$\pi = P_i Q_i - T_{ci} \quad (1)$$

Where

π = Gross margin (#) per enterprise

P_i = Price per unit of output

Q_i = Output of individual enterprise (in kg)

T_{ci} = Total costs of production (fixed cost) (fc) plus variable cost (Vc) (#)

Or

$$GR = TR - TC$$

$$\pi = GR - TC$$

WHERE

GR =Gross revenue

TC=Total cost

TR =PQ= Total revenue

π = Profit

P = Price per output

Q =Quantity of output produced.

2.6. The Regression Models

The ordinary least square (OLS) regression analysis therefore helps to determine the effect of changes in the explanatory variables on the dependent variable.

Where

$$Y_i = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, \mu_i)$$

Y_i = Net income (#)

X_1 =Age of respondent (in years)

X_2 =Marital status

X_3 =Education background

X_4 =Source of raw material

X_5 =Initial capital

X_6 =Transportation cost

X_7 = Labour cost

X_8 = Maintenance cost

μ = Error term

F =the functional relationship

3. Results and Discussions

3.1. Age of the Cassava Processors

The table below showed that majority of the cassava processors (37%) were in the 51-60 age groups. The mean age was 53.7 years. This result indicated that few of the processors who engage in cassava processing activity in active stage of their lives. This shows that they can still contribute immensely to the business.

| Age Range | Frequency | Percentage | Cumulative Percentage |
|-----------|-----------|------------|-----------------------|
| 21-30 | 3 | 3.0 | 3.0 |
| 31-40 | 7 | 7.0 | 10.0 |
| 41-50 | 26 | 26.0 | 36.0 |
| 51-60 | 37 | 37.0 | 74.0 |
| 61-70 | 17 | 17.0 | 90.0 |
| 71-80 | 9 | 9.0 | 99.0 |
| 81-90 | 1 | 1.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |

Table 1: Frequency Distribution of Respondents by Age
Source: Field Survey 2016

3.2. Educational Level of the Cassava Processors

The table below showed the type of educational level that the processors have in school. The table also showed that about 61.8% of the processors with frequency of 63 have no formal educational level while about 17.6% of the processors with frequency of 18 has secondary school level of education and about 4.9% of processor with frequency of 5 has tertiary school level of education. The low literacy level could be a challenge to acceptability of innovation that could help in betterment of their living standard.

| School Attended | Frequency | Percentage | Cumulative Percentage |
|---------------------|-----------|------------|-----------------------|
| No formal education | 63 | 61.8 | 63.0 |
| Primary | 14 | 13.7 | 77.0 |
| Secondary | 18 | 17.6 | 95.0 |
| Tertiary | 5 | 4.9 | 100.0 |
| Total | 100 | 100.0 | 100.0 |

Table 2: Frequency Distribution of Respondents by Education Level
Source: Field Survey 2016

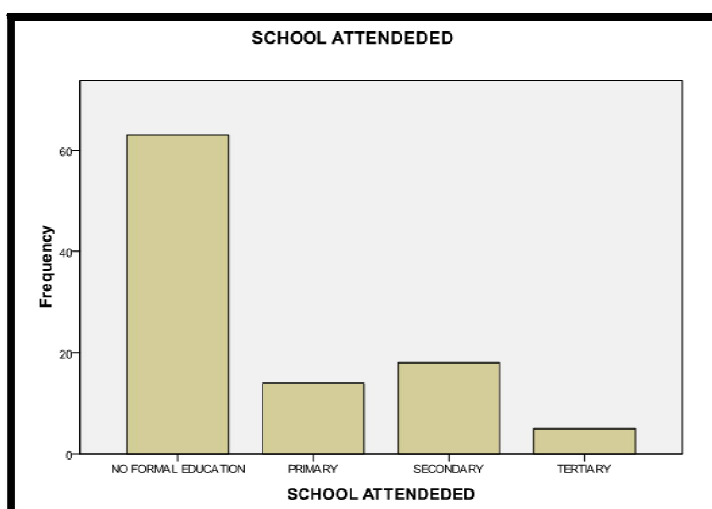


Figure 1

4. Marital Status of the Respondents

The table below shows that majority of the processors are married (96.1%) with an average family size of 5 individuals in the family. The result shows that the marital statuses of the respondents do affect their selling price and that most of the married processors require assistance from their spouses. The higher percentage of married respondents agreed with Jibowo (1992) who reported that the higher percentage farming populace is made up of married people.

| Status | Frequency | Percentage | Cumulative Percentage |
|---------|-----------|------------|-----------------------|
| Married | 98 | 98.0 | 98.0 |
| Single | 2 | 2.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |

Table 3: Frequency Distribution of the Respondents by Marital Status
Source: Field Survey 2016

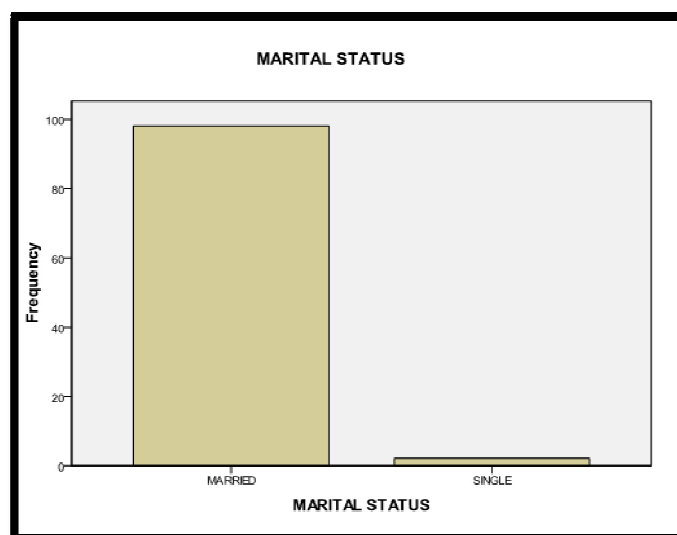


Figure 2

5. Farming Experience of the Respondents

The number of years farmers spend in farming business could give an indication of the practical knowledge acquired over a number of years. Hence, experience has a considerable effect on production efficiency. The table below shows years of experience of the respondents. Majority of the processors which is between (16-25) years with proportion of 31% while about 15% of them have (5-15) years of experience in the work and about 27% of them have between (26-35) years of experience. The average farming experience is 29 years.

| Farming Experience | Frequency | Percentage | Cumulative Percentage |
|--------------------|-----------|------------|-----------------------|
| 0-15 | 15 | 15.0 | 15.0 |
| 16-25 | 31 | 31.0 | 46.0 |
| 26-35 | 27 | 27.0 | 73.0 |
| 36-45 | 18 | 18.0 | 91.0 |
| 46-55 | 7 | 7.0 | 98.0 |
| 56-65 | 2 | 2.0 | 100.0 |
| Total | 100 | 100 | 100.0 |

Table 4: Frequency Distribution of the Respondents by Their Experience
Source: Field Survey 2016

5.1. Source of Raw Materials of the Respondents

The sources of raw material determine the selling price of the product which in turn will affect their net income positively or negatively. The table below shows that majority of the respondents source their raw material from the market (77%). While 23% of the source their raw materials from the farm.

| Source of Raw Material | Frequency | Percentage | Cumulative Percentage |
|------------------------|-----------|------------|-----------------------|
| Market | 77 | 77.0 | 77.0 |
| Farm | 23 | 23.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |

Table 5: Frequency Distribution of the Respondents by Source of Raw Material
Source: Field Survey 2016

5.2. Transporting of Cassava to the Processing Unit of the Respondents

The table below shows how the processors transports cassava to the processing unit by head load with 77% and wheel borrow with 20% while family assistances and vehicles having a low proportion of 1% and 2%.

| Transporting of Cassava to the Processing Unit | Frequency | Percentage | Cumulative Percentage |
|--|-----------|------------|-----------------------|
| Head load | 77 | 77.0 | 77.0 |
| Family assistance | 1 | 1.0 | 78.0 |
| Vehicles | 2 | 2.0 | 80.0 |
| Wheel borrow | 20 | 20.0 | 100.0 |
| Total | 100 | 100 | 100.0 |

Table 6: Frequency Distribution of Respondents by Transporting Cassava to the Processing Units
Source: Field Survey 2016

5.3. Selling Price on/off Season per Bag of the Respondents

The table below shows the various selling price on/off season of the respondents.

| Selling Price on/off Season | Frequency | Percentage | Cumulative Percentage |
|-----------------------------|-----------|------------|-----------------------|
| 4300 | 1 | 1.0 | 1.0 |
| 4500 | 2 | 2.0 | 3.0 |
| 4800 | 23 | 23.0 | 26.0 |
| 5000 | 72 | 72.0 | 98.0 |
| 5500 | 1 | 1.0 | 99.0 |
| 5650 | 1 | 1.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |

Table 7: Frequency Distribution of Respondents by Selling Price on/off Season per Bag

Source: Field Survey 2016

5.4. Methods of Processing of the Respondents

The table below shows the processing methods the processors uses. There are only two methods of processing; traditional method and modern method. The result shows that about 99% of the respondents use traditional method while about 1% of them use modern method.

| Methods | Frequency | Percentage | Cumulative Percentage |
|-------------|-----------|------------|-----------------------|
| Modern | 1 | 1.0 | 1.0 |
| Traditional | 99.0 | 99.0 | 100.0 |
| Total | 100 | 100.0 | 100 |

Table 8: Frequency Distribution of Respondents by Method of Processing

Source: Field Survey 2016

5.5. Cost of Maintenance of the Respondents

The table below shows the cost of maintenance of the processor ranging from (1000-15000) with 75% having the highest proportion of ₦1400.0 and 20% of ₦1200.00 of cost of maintenance.

| Cost of Maintenance | Frequency | Percentage | Cumulative Percentage |
|---------------------|-----------|------------|-----------------------|
| 1000 | 1 | 1.0 | 1.0 |
| 1200 | 20 | 20.0 | 21.0 |
| 1400 | 75 | 75.0 | 96.0 |
| 1700 | 3 | 3.0 | 99.0 |
| 15000 | 1 | 1.0 | 100.0 |
| Total | 100 | 100.0 | 100.0 |

Table 9: Frequency Distribution of Respondents by Cost of Maintenance

Source: Field Survey 2016

5.6. Problems Faced During Marketing Activity of the Respondents

The table below shows the various problems faced by the processors with 98% and 1% of the highest and lowest problem faced which implies that the problem faced can affect income of the respondents.

| Problem Faced During Marketing | Frequency | Percentage | Cumulative Percentage |
|--------------------------------|-----------|------------|-----------------------|
| Price variation | 98 | 98.0 | 98.0 |
| Scarcity | 1 | 1.0 | 99.0 |
| Others | 1 | 1.0 | 100.0 |
| Total | 100 | 100.0 | |

Table 10: Frequency Distribution of the Respondents by the Problems Faced During Marketing

Source: Field Survey 2016

5.7. Cost and Return (Gross Margin) of the Enterprise

The following is a presentation of the cost and return of cassava processing of respondent using the standard enterprise budget format.

$$GR = TR - TC$$

$$\pi = GR - TC$$

Where:

$$GR = \text{₦}18,539,200.00$$

$$\text{Total cost for transportation, TRS.} = \text{₦}86,400.00$$

$$\text{Total cost of labour, TC} = \text{₦}41700$$

$$\text{Total cost for maintenance, TM} = \text{₦}150,100.00$$

Total cost for raw material, TRM = ₦ 3,000,000.00

$$GR = ₦ (18,539,200.00 - 86,400 - 41,700 - 150,100.00 - 3,000,000.00)$$

$$= ₦ (18,539,200.00 - 3,278,200.00)$$

$$\pi = ₦ 15,261,000.00$$

$$\text{Per farmer} = ₦ 15,261,000.00/100$$

$$₦ 152,610.00$$

$$IRR = \frac{\text{Net returns}}{\text{Total cost}}$$

$$= \frac{₦15,261,000.00}{₦3,278,200.00}$$

$$IRR = ₦ 4.66$$

Internal rate of return (IRR) is the amount of money that would be generated on a naira invested in business. A high rate of return signifies a profitable enterprise. From the above cost and return analysis, it shows that the interviewed farmers made ₦15,261,000.00 profits for all cassava processed produced. The internal rate of return (IRR) of ₦4.66 revealed that on every n farmers naira invested by the respondent farmers, ₦4.66k was realized in return. From this result, one can conclude that cassava processing in the area were slightly rewarded for their efforts (i.e. 66 kobo on every naira invested).

5.8. Regression Analysis

Relationships between socio-economic characteristics of the respondents and their selling price. The determinants of income were estimated (Table 11). Data were fitted to four functional forms using ordinary least square techniques (OLS). The estimated functions were evaluated vis-à-vis the statistical significance of R^2 as expressed by the F-ratio, the significance of the coefficients as attested to by the p-values, the plausible signs and magnitude of the coefficients and the magnitude of the standard errors. The a priori expectation of the independent variables was that their coefficients would carry positive signs. Having tested the effects of all the regressors on the regress and, the Cobb Douglas production function was chosen as the lead equation

| Variables | Coef | P | Marginal Effect | Elasticity |
|----------------|------------|---------|-----------------|------------|
| Age | -0.035494 | 0.010* | 0.006* | 0.006* |
| MS | -0.0244635 | 0.447 | 0.441 | 0.441 |
| EDU | 0.0205957 | 0.004* | 0.002* | 0.002* |
| SOURCE | -0.0049002 | 0.699 | 0.696 | 0.696 |
| INTIN CAP | 0.0508159 | 0.028** | 0.021* | 0.021* |
| TRN CST | -0.0046228 | 0.470 | 0.465 | 0.465 |
| Lab CST | 0.0581457 | 0.013* | 0.008* | 0.008* |
| MINT CST | -0.0705512 | 0.036** | 0.028** | 0.028** |
| Constant | 8.810484 | 0.000 | | |
| NO OF OBS | 39 | | | |
| F (8, 30) | 10.13 | | | |
| PROB >F | 0.0000 | | | |
| R- SQUARED | 0.7298 | | | |
| ADJ R- SQUARED | 0.6577 | | | |
| ROOT MSE | 0.01968 | | | |

Table 11: Regression Results

1% Level Of Significant = * 5% Level Of Significant = ** 10% Level Of Significant = ***

The regression results reveal that the coefficient of the multiple determinations (R^2) is 73%. The adjusted R^2 of 0.6577 means that 65.8% of the variations in the dependent variable were explained by its relations with the independent variables.

In the linear regression model each slope coefficient gives the marginal effect of that variable on the mean or average value of the dependent variable, holding all other variables in the model constant. Initial capital, Labour cost and years of schooling were positive and were statistically significant at 5%, 1% and 1% respectively. This implies that additional increase in invested capital will lead to 5.08% increase in income. Likewise, the more educated a processor is the better. Age, and Maintenance cost are negative and were statistically significant at 1%, and 5% respectively. This implies that the older the processor, the less productive they become.

5.9. Test of Hypotheses

The hypothesis in this study stated that there is no significant relationship between socio-economic characteristics of the respondents and income from small scale cassava processing. Table 11 showed the significant levels of these explanatory variables. Therefore the hypothesis that there is no significant relationship between socio-economic characteristics of the respondents and income from small scale cassava processing was rejected.

6. Summary, Conclusion and Recommendation

6.1. Summary

The study examined the determinant of income from small scale cassava processing activities in Surulere Local Government Area, Ogbomoso, Oyo State. Relevant literatures on the various improved cassava processing were reviewed and the information got served as guide in this study. Samples of 100 cassava processors were selected for interview. Data were collected from all the respondents with the use of structured interview schedules, which were constructed based on specific objectives of the study.

The results revealed that majority of the processors are in the 51-60 age groups. The average age was 53.7years. This result indicates that most of the cassava processors engaged in the cassava processing activities on the active phase of their lives.

The results also revealed that most of the respondents were illiterate and would not be able to make good use of extension information effectiveness. In addition, it showed that majority of the respondents were married with an average household size of 5 individuals and assistance will come from their spouses but at the same time responsibilities will be increased and will reduce the processors effectiveness.

The study further revealed that there are no enough cassava processing factories in the study area and thus may imply limited scale of production. Also there is significant between the cost and return of cassava processing activities in the study area which will bring a profitable enterprise.

The result of the regression revealed that the coefficient of the multiple determinations (R^2) is 73%. The adjusted R^2 of 0.6577, means that 65.8% of the variations in the dependent variable were explained by its associations with the independent variables. Initial capital, Labour cost and years of schooling were positive and were statistically significant at 5%, 1% and 1% respectively. This implies that additional increase in invested capital will lead to 5.08% increase in income. Likewise, the more educated a processor is the better. Age, and Maintenance cost are negative and were statistically significant at 1%, and 5% respectively.

7. Conclusion

The relationship between the socio-economic characteristics and selling price of the respondents were analyzed and the relationship between the processing activities and selling price of the respondents were also analyzed. It was discovered that some of the socio-economic characteristics of the respondents have impart on their income. Also, it was discovered that cassava processing in the study area is profitable.

Some of the problems identified by the cassava processors include high cost of processing equipment, transportation difficulties, poor infrastructural facilities, shortage of labour, poor access to market, lack of fund and poor storage facilities.

8. Recommendation

Based on the major funding of the study recommendations were made for effective agricultural extension services so as to increase local productivity of cassava in Nigeria.

The government should work on the introduction of the modern or mechanical method of processing cassava, thereby making the processing work less laborious. The government should sharpen the storage policies which would reduce stress and tension of cassava supply as the processing material at cassava off season.

Adequate number of well-trained extension staff (mostly female) should be employed to relate better with their counterparts involved in cassava processing.

Cassava processors should be encouraged to form groups and co-operatives so as to be able to fully enhance their income and help for better sustenance.

Government should work on the marketing of the processed cassava, and ensure a guarantee marketing of the processed goods.

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