

Analysis of Cost and Returns among Cassava Farmers in Cross River State, Nigeria

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Abstract: *The study analyzed the cost and returns among cassava farmers in Cross River State, Nigeria. Survey design was adopted. A three stage (multistage) random sampling technique was used in the selection of 108 respondents from the three agricultural zones of the state. Data for the study were collected from mainly primary sources with the aid of a pre-tested questionnaire which was administered to the respondents by trained enumerators. Gross margin analysis was used to analyse the data collected. The result indicated that the total variable cost (TVC) of cassava farmers was estimated at ₦1135,54.99, which represents expenses on cassava cuttings (12.80%), transportation (4.95), rent on land (8.98%), cost of labour (48.45%), fertilizers (7.40%) pesticides (5.58%), herbicides (11.85%). Total revenue and gross margin was estimated at ₦251424.80 and ₦137869.81 respectively, during the production period. This result indicates that cassava production is a profitable venture. Cassava (*manihot esculenta crantz*) is purposefully chosen for this study because it is the most widely cultivated and important crop in Cross River State, Nigeria. One of the staple food crops which has the potentials of putting the country out of the present food quagmire. Cassava is an important source of starch in form of carbohydrate. The crop is processed into garri, fufu, tapioca, akara, etc. while for non-food application; cassava can be used in the manufacture of cassava starch, pellets and chips for animal consumption as well as used for bio-fuel and making of particle boards. The study recommended that farmers should be encouraged to invest in cassava production for its profitability and economic value. Inputs should be made available and at affordable prices especially improved varieties of cassava cuttings and cassava farmers should be encouraged to receive training on proper agronomic practices and usage of inputs also to enhance production.*

Keywords: cassava, cost, returns, marginal analysis, farmers

1. Introduction

Cost refers to the values of the inputs used in production while returns are gains from production (Adegeye & Dittoh, 1985; Olukosi & Erhabor, 2005). Ibrahim, Ayinde, and Arowolo, A.O (2014) defined the cost of producing any good or services as the value of the resource used in producing them in their best alternative, since there are other alternatives means of attaining these production goals. Production naturally is aimed at either maximizing output, maximizing profit, maximizing utility; minimizing cost or a combination of or all these (Olayide & Heady, 1982).

Olukosi and Isitor (1990) and Olukosi and Ogungbile (2005) examined two major categories of cost involved in crop production. These are variable cost (VC) and fixed costs (FC), variable costs (VC) referred to those costs that vary with level of production (output). Examples are cost of seeds, fertiliser, and expenses on hired labour. Spurlock and Gills (1997) stated that variable costs are those that a manager controls in the short run and that will increase as total planned production is increased. Fixed costs (FC) on the contrary refers to those cost that do not vary with level of production or output, examples are rent on land, interest on capital, degradation cost, costs of machinery, etc. The summation of VC and FC gives rise to total cost (TC).

As a measure of farmers' net returns from the farm enterprises, Olukosi and Erhabor (2005) defined gross margin (GM) as the difference between the gross farm income (GFI) and the total variable cost (TVC) i.e. $GM = GFI - TVC$. It is used as a primary measure of profitability under the assumption that fixed cost is negligible as what

obtained under traditional farming system and that the analysis is for a short term. According to (Farris and Bendle, 2012) gross margin is the difference between revenue and cost of goods sold, divided by revenue, expressed as a percentage. Generally, it is calculated as the selling price of an item, less the cost of goods sold. Gross Margin is often used interchangeably with Gross Profit, but the terms are different. When speaking about a money amount, it is technically correct to use the term Gross Profit but when referring to a percentage or ratio, it is correct to use Gross Margin (Farris and Bendle, 2012). In other words, Gross Margin is a percentage value, while Gross Profit is a money value. Gross Margin is a type of profit margin, specifically a form of profit divided by net revenue: for example, gross (profit) margin; operating (profit) margin; net (profit) margin; etc. The purpose of margins is "to determine the value of incremental sales, and to guide pricing and promotion decision.

Margin on sales represents a key factor behind many of the most fundamental farm business considerations, including budgets and forecasts. All farm managers should, and generally do, know their approximate business margins. Gross margin is useful where the value of the fixed cost is negligible as it is the case with cassava production which is operated mostly at small- scale level and traditional way (Arene, 2006).

Cassava (*manihot esculenta crantz*) is a crop native of South America, which was introduced into the country during the period of slave trade proliferation by the Portuguese explorers and colonizers in the sixteenth century (Ugwaja & Aledesote, 2014). They further stated that, the importance of

the crop in the country got a boost in the nineteenth century when more slaves returned and introduced processing techniques. Over the years, cassava has become the major economic sustenance crop and the country has attained the status of largest producer in the world with recorded production of 54 million tons as a cash crop of great importance to the people of Nigeria (Ettah & Nweze, 2016).

The crop is a perennial woody shrub of the *euphorbiaceae* family. According to Awoyinka (2009) It is grown principally for its tuberous root but its leaves are also eaten in some parts of Africa and used as animal feeds as well. In terms of its nutritional value, cassava roots contain about 60 percent of water and are rich in carbohydrates (Yakassai, 2010). The roots are low in protein and lipids but reasonably rich in calcium and vitamin. Products from cassava when consumed with energy dense protein and nutrient rich supplementary foods such as beans and oil seeds, fishes and pulses provide energy in adequate diet (Ekubika, 2010). Though the crop is produced in 24 of the 36 states in the country, cassava production dominates the southern parts of the country, both in terms of area covered and number of farmers growing the crop (Ettah & Nweze, 2016). They further noted that the major states of Nigeria which produce cassava are Anambra, Delta, Edo, Benue, Cross River, Imo, Oyo and Rivers States and to lesser extent Kwara and Ondo States.

Cassava displays an exceptional ability to adapt to climate changes. It is tolerant to low soil fertility, resistant to drought conditions, pests and disease and suitable to store its root for long periods underground even after maturity. Hence it is grown throughout the year making it preferable to the seasonal crops of yam, beans, pea, etc. Use of fertilizer is limited and it is also grown in fallow lands. The land holding for farming in Nigeria is mostly between 0.5 - 2.5 hectares (1.2 - 6.2 acres), with about 92 percent of producers being small - scale farmers (Kuye, & Ettah, 2016).

In Cross River State, Nigeria, cassava is widely cultivated in the state and grows in all the 18 local government areas (Adinya, *et. al.*, 2008).

1.2 Objectives of the Study

The study is aimed at achieving the following:

- 1) Estimate the cost and returns in cassava production
- 2) Identify the profitability of cassava enterprise
- 3) Make policy recommendations.

2. Materials and Methods

2.1 Study Area

Cross River State, Nigeria is the study area. The state was purposively chosen for this study because of three reasons: The dominance of cassava production in the area, the peculiarity of this research problem in the area and the familiarity of the researchers to the area, factors that facilitated data generation. The State is bounded by the Nigeria States of Benue in the North, Ebonyi on the West, Akwa Ibom on the South west. It is bordered on the east by

the Cameroon Republic and fronts the Atlantic Ocean on the South (Boundaries Commission Newsletter, 2010).

The state lies between latitude 4°15' North and 7°00' North and longitude 7°15' East and 9°30' East. (Cross River Ministry of Lands and Survey Bulletin, 2012). According to Federal Office of Statistics (FOS) (2007) the land area of Cross River State is about 7,782 square miles or 20,156 square kilometers and the population standing at 2,888,966 persons (NPC, 2006).

The climate of the state is characterized by two distinct seasons-the dry and wet seasons. The dry season spans from November to late March, while rainy season spans from April to October with a short spell in August called "August break" (Adeniji, *et. al.*, 2005). The mean annual rainfall is between 1,300mm to 3,000mm, which varies from place to place across the state (Cross River State Tourism Guide, 2011). According to the tourism guide, highest temperature is recorded between February and March and does not exceed 37°C and the lowest between May and October and does not go below 15°C and also varies from place to place. The vegetation of the state parades four distinct features: Mangrove Swamp (wetland), rainforest, derived savannah and parkland (Cross River Tourism Bulletin, 2012). The type of soil found in the area is deep laterite fertile and dark clayey basalt. Hence, agriculture is the major activity of Cross Riverians. Studies by Abang & Agom (2009) shows that over 75% of the people of the state are engaged in agriculture. This figure is distributed in agricultural production, processing and distribution. For convenience of administration, the eighteen local government areas the state is divided into were further subdivided into three agricultural zones by the Cross River State Agricultural Development Project (CRADP). The Southern zone comprises of the following local government areas. Akpabuyo, New Bakassi, Calabar municipality, Calabar South, Biase, Akpamkpa, and Odukpani, with headquarters in Calabar municipality. The central zone has Yakurr, Abi, Obubra, Ikom, Etung and Boki, with headquarters in Ikom while the northern zone has, Ogoja, Bekwarra, Yala, Obanliku and Obudu, with headquarters in Ogoja.

2.2 Sampling Procedure

Cassava farmers from Cross River State formed the population for this study. A three stage (multistage) random sampling technique was used to select respondents for the study. The three agricultural zones (Calabar, Ikom and Ogoja) of the state which reflected the demarcation structure were covered. In the first stage, three local government areas each were selected randomly from each of the three agricultural zones. This gave a total of nine local government areas in the sample. The second stage involved the random selection of three cassava farming communities from each of the nine local government areas previously selected making a total of twenty seven cassava farming communities in the sample. The third stage involved a random selection of four cassava farmers from each of the twenty seven cassava farming communities making a total of 108 respondents for the study.

2.3 Data Collection

Data required for this study was generated from primary sources. The primary data were collected using a set of pre-tested and structured questionnaires. The questionnaires were administered by well-trained enumerators, who were conversant with the selected locality. Primary data were also obtained through personal contact, oral interviews, etc.

The first part of the questionnaire gave general information of the farmers: sex, age, name of village, marital status, etc.

Questions related to costs associated with cassava production formed part two of the questionnaire. While part three on the other hand dealt with questions on revenue accruing to cassava production.

2.4 Validation and reliability of Research Instruments

The questionnaire for data collection in this study was validated by pilot testing and passing through erudite scholars in the Department of Agricultural Economics & Extension, Faculty of Agriculture & Forestry, Cross River University of Technology, Obubra, Cross River State, Nigeria, to ensure that it possessed both face and content validity. For consistency of the measuring instrument over time, reliability test was conducted using the test-retest method. The instrument was tested on cassava farmers in Yakurr Local Government Area of Cross River State and a coefficient of 0.79 was obtained using the Cronbach Alpha Technique. It was achieved by passing the questionnaire to the same respondents at two points in time (an interval of seven days) and the scores compared.

2.5 Data Analysis

The data collected for the study were analyzed using both descriptive and inferential statistics. Descriptive statistics which included frequency, mean, percentage and inferential statistics of gross margin analysis were used for the analysis. Gross margin is given as:

$$GM = TR - TVC$$

Where:

GM = Gross Margin

TR = Total Revenue (₦)

TVC = Total Variable Cost (₦)

This estimation served as a profit index of cassava producers in the study area. As it is conventional, the higher the GM the more profitable a farm is likely to be and the smaller the GM, the lesser the profitability (Farris and Bendle, 2012).

3. Results and Discussion

3.1 Cost and Return for Cassava Production

Table 1 below shows the result of estimated costs and returns associated with cassava farmers in the study area. The result indicated that the total variable cost (TVC) of cassava farmers was estimated at ₦113,554.99, which represents expenses on cassava cuttings (12.80%), transportation (4.95), rent on land (8.98%), cost of labour (48.45%), fertilizers (7.40%) pesticides (5.58%), herbicides

(11.85%). Total revenue and gross margin were estimated at ₦251,424.80 and ₦137,869.81 respectively during the production period. This result indicates that cassava production is a profitable venture. This result agrees with the findings of Ademiluyi and Ayodele (2014) and Ettah & Nweze (2016) who stated that the profitability index for every naira invested by the adopters of improved cassava production business was 0.50 kobo and non-adopters were 0.30 kobo.

Furthermore, the result of this study is also in consonance with that of Yusuf *et. al.*, (2014), who also reported total average revenue of ₦99,750.00 and a net farm income of ₦29,060.00. He had cost of labour as the highest expenditure of total variable cost, which agrees with this study, which had cost of labour as the highest expenditure (48.45%) of total variable cost. The high cost of labour implies that this variable is relatively in short supply which may be due to high rural urban migration and shortage of family labour, due to reduced household size, off farm activities of most families, etc. in the study area. They further reported that return on naira invested was ₦1.41 which shows that farmers in the study area realized profit in cassava production as ₦1 invested will realize a profit of ₦ 0.41

Table 3.1: Estimated Cost and Returns of Cassava Production

Item	Mean amount (₦)	Percentage of TVC
Variable costs		
Rent on Land	10,200.00	8.98
Cost of Labour	55,022.36	48.45
Fertilizer	8,350.07	7.40
Cassava cuttings	14,550.12	12.80
Pesticides	6,345.45	5.58
Herbicides	13,456.14	11.85
Transport Cost	5,630.85	4.95
Total Variable Costs (TVC)	113554.99	100
Revenue		
Sales of cassava	212424.80	
Sales of cassava stem	39,000.00	
Total Revenue (TR)	251424.80	
Gross margin (GM) = TR-TVC	137869.81	

Source: field survey, 2016.

4. Conclusion

Study examined the analysis of cost and returns among cassava farmers in Cross River State, Nigeria. The specific objectives were to estimate cost and returns of cassava farmers, identify the profitability of cassava production and make policy recommendations. A three stage (multistage) random sampling technique was adopted in the selection of 108 respondents. The statistical tools used for analysis were percentages, mean and gross margin analysis. The result of the cost and return analysis showed that cassava farming is profitable as it returned a gross margin of ₦ 137,869.81 for each production cycle.

Based on the findings of the study, the following recommendations are made: farmers should be encouraged to invest on cassava production for its profitability and

economic value, inputs should be made available and at affordable prices especially improved varieties of cassava cuttings and cassava farmers should be encouraged to receive training on proper agronomic practices and usage of inputs to enhance production. Finally, the study recommends a further study on cost efficiency among cassava farmers in Cross River State, Nigeria.

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