

**ANALYSIS OF SOCIO-ECONOMIC CHARACTERISTICS AND PROFITABILITY IN
CASHEW NUT PRODUCTION IN KOGI STATE, NIGERIA.**

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Abstract

The study was carried out to analyze the socio-economic characteristics and profitability in Cashew nut production in Kogi state, Nigeria. It specifically examined the socio-economic characteristics of Cashew nut producers, assessed the effect of socio-economic variables on Cashew nut production and determined the cost and returns in Cashew nut production in the study area. A multistage sampling technique was used to select 192 cashew nut producers and questionnaire was used to collect data. Descriptive statistics, multiple regression techniques and Net Returns analysis were used to analyze the data collected. Results showed that most of the cashew nut producers were males. Most of the producers were in their prime age. The mean household size was found to be eight (8) persons. About 68% variability in the dependent variable is as accounted for by the independent variable. All the coefficients except farming experience and years in school carried the expected positive signs. Farm size was significant at 1%, Labour was significant at 5%, Capital invested was significant at 1%, herbicide application was significant at 5%, sex was significant at 5% and years in school was significant at 1%. Profitability analysis gave gross margin of ₦60, 129.17, Net returns of ₦57, 761.98, Returns in capital invested of ₦3.37 and gross ratio of 0.23. From the finding, it was concluded that cashew nut production is a profitable business and has provided means of livelihood to the producers. It was recommended that there should be awareness campaign for cashew producers in order to train them in the best agronomic practices, post-harvest handling and marketing. Assistance should be given to producers in the area of credit facilities and provision of small and medium scale industries credit scheme to promote industrial processing of nuts in the state.

Keywords: Cashew nut, multiple regressions, socio-economics, Net Returns

Introduction

Cashew is an important industrial and export crop whose potential is yet to be fully exploited in Nigeria (Asiru et al, 2005). According to Deckers *et al.* (2001) and Crusoe (2006), the name cashew is from the Portuguese Caju, which in turn comes from Tupi-India word acaju. Umoh *et al* (2005) reported that India was rated as the world's largest producer of

cashew, producing about 36 percent of world's 1,217,210 tonnes in 2001 – 2002. As at 2005 Vietnam became the highest volume producer with 827,000 MT followed by India with production of 460,000 MT. India is closely followed by Brazil with yearly production of 251,000 tonnes while Nigeria is fourth with yearly production of 213,000MT.

Cashew is a crop with wide ecological distribution within Nigeria. It is a tree crop of considerable economic importance to Nigeria and other tropical countries. Major cashew growing areas in Nigeria are by order of importance. Enugu, Abia, Imo, Anambra, Ebonyi and Cross River States in the eastern part of the country; Oyo, Osun, Ondo, Ekiti and Ogun States in the Western part as well as Kwara, Kogi, Nasarawa, Benue, Taraba, Niger and FCT in the middle Belt and also Sokoto and Kebbi States in the north west (Ezeagu, 2002). According to Asogwa *et al.* (2008), cashew is an emerging commodity crop whose cultivation cuts across the seven agro-ecologies in Nigeria. In each of the 27 cashew, producing states in Nigeria the numerical strength of the farmers is increasing, while the crops hectareage is correspondingly on the increase.

According to Crusoe (2006), by the year 2000 there were indications that total hectare had increased significantly to about 100,000 hectares due to the involvement of some state governments in cashew cultivation. He is of the view that the expansion was a direct result of the cashew production expansion programme of those states. With the introduction of Brazilian cashew biotype with improved and desirable nut and kernel quality characteristics by cocoa research institute in Nigeria (CRIN) has further increased the crops spread and popularity in Nigeria (Hammed *et al.* 2007).

Cashew nut production is regarded as economically promising for both rural growers and urban industrial processors in terms of income and employment generation. Despite its importance in global phenomenon, cashew farmers have not been able to exploit on large part cashew's economic value. Efforts to upgrade through improved production and processing strategies to increase economic benefits have been faced with difficulties. According to Lawal *et al.* (2010), presently in Nigeria, products of the cashew tree (kernel and apple) are under-utilized for income generation. There is still much the harvesters consume wastage of the fresh apples on farms since a negligible portion. This wastage reduces the household income. There is lack of

awareness of cashew product potential among farmers. The inadequate recognition and exploitation of cashew potentials pose serious setbacks to farmers and stakeholders in Nigeria in terms of sustainability of the subsector (Agbongiarhuoyi *et al.*, 2008).

According to Abubakar (2003), cashew production is gender sensitive. The male domination of cashew farming activities could be attributed to the fact that women are given opportunity to cultivate arable crops on their husband's plots while access to permanent crop production is usually restricted to men.

Objectives of the study

The broad objective is to analyze the socio-economic characteristics and profitability in cashew nut production in Kogi State, Nigeria. The specific objectives are to:

- (i) examine the socio-economic characteristics of cashew nut producers.
- (ii) assess the effects of socio-economic variables on cashew nut production in the study area.
- (iii) determine the cost and returns in cashew nut production

Theoretical framework and literature review

In agricultural production, the farm firm combines resources such as land, labour, capital and management to produce output. It is considered useful to clarify a few definitional issues such as production and production function.

Oluwatayo *et al.* (2008) stated that production is the process of transforming inputs such as capital labour and land into goods and services called output. The theory of production presents the theoretical and empirical framework that facilitates a proper selection among alternatives so that any one or a combination of the farmer's objectives can be attained. A production function stipulates the technical relationship between inputs and output involved in production. The purpose of the production function is to identify and measures how variable inputs are able to explain the variability in outputs.

Nwosu (2005) stated that, for any production function, the correct functional form could be determined by fitting various feasible functional forms to obtain the best fit, which is normally selected based on economic, statistical and econometric soundness. He explained that various functional forms can be used to describe production relationships, but in practice the most commonly used forms include the linear, quadratic and Cobb-Douglas functional forms. Production function is the basic building block for the economic analysis to follow. According to Adepoju *et al.* (2008), the importance of production function analysis is to measure the contribution of each input to production when the inputs interact with one another to produce an output. This has the advantage of being statistical

hence permitting hypothesis testing and calculation of confidence interval to test the reliability of the estimated model. Such model explicitly measures the marginal contribution of each category of inputs to aggregate production output.

According to Uwagboe *et al.* (2010), age is an important factor in farm work. Increase in number of years of farmers might result in additional experience of the farmer to improve upon their level of productivity and income. Nwaru *et al.* (2006) stated that the older a farmer becomes, the more his efficiency drops. They further observed that the innovations of a farmer, his mental capacity to cope with the daily challenges, demands of farm production activities and his ability to do manual work, bears directly on his production efficiency. Nazneen *et al.* (2004) disclosed that men only do no distinct gender division of labour in cashew production apart from pruning which in most cases. In other activities such as sowing and planting, weeding, clearing and harvesting, both men and women participate albeit in different proportions.

According to Oluwatayo *et al.* (2008), most of the farmers usually have more than one wife with a large family for having more access to family labour. Lawal *et al.* (2010) reported that an increase by one person in household size may be the result of having more hands to work, thereby reducing the cost of labour and hence, improving their profit margins. The farmer's level of education could enhance their farming activities, level of awareness and level of receptivity of improved technologies (Uwagboe *et al.*, 2010). The level of education of a farmer not only increases his productivity but also enhances his ability to understand and evaluate new production techniques. Education and training produce a labour force that is more skilled and adaptable to the needs of changing economy because, *ceteris paribus*, educated farmers are more amenable to risk taking and change than non- educated ones (Nwaru *et al.*, 2006).

Enete *et al.* (2002) reported that years of experience had a positive impact on production system and household income among women farmers in Nigeria. Nwaru *et al.* (2006) observed that farmers would count more on their farming experience for improved productivity rather than their educational attainment. This is because the number of years a farmer has spent in the farming business may give an indication of the practical knowledge he has acquired on how to cope with the inherent farm production, processing and marketing problems leading to higher levels of efficiency.

Umoh (2006) made an effort to determine the cost associated with farming and revenue that accrues to the farmers' efforts. Only the variable cost of production was considered while the profitability was measured as the gross margin. Economists agree that profit maximization is one of the major objectives of firms (Samuelson and Nordhaus, 2005). Nwaru *et al.*,

(2011) investigated the determinants of profit in banana marketing in Umuahia Agricultural Zone of Abia State, Nigeria. They opined that quantity of bananas handled and the selling price per unit of banana were directly related to profit

Materials and method

The study area and sampling procedure

The study was conducted in Kogi State, located in the middle belt region of Nigeria. The study area lies between latitude 6°30'N and 8°48'N and longitude 5°23'E and 7°48'E. The main tribes are the Igala, Ebiraland and Yoruba. The crops commonly cultivated include; Cashew, Cocoa, Palm tree, Coffee, Groundnut, Maize, Cassava, Rice, yam and Melon.

Multi-stage random and purposive random sampling techniques were used to select cashew farmers from the four (4) Agricultural zones of the state. Two local government areas were selected from each of the agricultural zones. Two cashew communities were purposively selected from each of the LGAs. Twelve (12) cashew farmers were randomly selected from each of the sixteen (16) communities. In all, 192 questionnaires were administered. The data collected were on farm size, labour used, capital invested, herbicide application, age of the farmers, sex, household size, years spent in school and cashew farming experience.

Descriptive statistics such as mean, frequency distribution and percentages were used to examine socio-economic characteristics of cashew nut producers. Multiple regression analysis was used to assess the effects of socio-economic characteristics on cashew nut production. The production function was implicitly specified as:

$$y = f(x_1, x_2, x_3, x_4, x_5, x_6, x_7, x_8, x_9, U)$$

Where y = Output of cashew nut (kg)

x_1 = Farm size (ha)

x_2 = Labour used (man days)

x_3 = Capital invested (₦)

x_4 = Herbicide application (ltr)

x_5 = Age of farmers (yrs.)

x_6 = Sex (male=1, female=0)

x_7 = Household size (No of persons)

x_8 = Level of education (number of years spent in school)

x_9 = cashew farming experience (yrs.)

U = Random disturbance or error term

Data were fitted to three (3) functional forms of the multiple regression model 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 t-values, the plausible signs and magnitude of the coefficients. The apriori expectation is that the coefficients of $x_1, x_2, x_3, x_4, x_6, x_8, x_9 > 0; x_5, x_7 < 0$ Net returns (NR) were used to determine the cost and returns in cashew nut production in the study area. The model is specified as:

$$NR = GM - TFC$$

NR = Net returns

GM = Gross Margin

TFC = Total Fixed Cost

Gross ratio of the farm was also calculated. Gross ratio is a profitability ratio that measures the overall success of the farm. The lower the ratio, the higher the return per naira invested.

$$\text{So GR} = \frac{TFC}{GI} \quad (\text{Jirgi et al 2010})$$

GI

Where GR = Gross ratio

TFC = Total Farm Experience (i.e. Total Variable Cost)

GI = Gross Income (Total revenue)

Return on capital invested was also calculated. Return on capital invested measures the profitability of an investment. ROI greater than 1 indicates a potentially profitable venture and if less than 1, it indicates a potentially unprofitable venture (Nwaiwu *et al*, 2012).

$$ROI = \frac{GM}{TVC}$$

TVC

Where ROI = Return on capital invested

GM = Gross Margin

TVC = Total Variable Cost

Results and discussion

Findings on the socio-economic characteristics of respondents in the study area in Table 1 shows that 79.2% of the producers were males and 20.8% were females. The result also showed that greater percentage of 87.5% producers interviewed were above forty years. Few cashew nut producers in the study area (12.5%) were between the ages of 30-39 years. The mean age of the farmers was 49 years. This result agrees with the findings of Wongnaa and Ofori, (2012) in their study of Resource Use Efficiency in Cashew Production in Wenchi, Ghana. The findings on the household size of the cashew nut producers indicated that greater percentage of the producers (74%) had a household size that ranged from 3-7 persons. About 22.9% of the producers have household size that ranged from 8-12 persons while the mean household size was found to be eight persons.

The study showed that 88.5% of the respondents in the study area are married and 9.9% are widowed while 1.6% are divorced indicating that majority of cashew producers are married. From the study, it was realized that 38% of cashew nut producers in Kogi State are illiterates, that is, such farmers did not receive formal education. About 36.9% attended primary school while 5.7% and 19.3% attended secondary and tertiary education respectively.

Lack of formal education can affect adoption for innovations negatively. This agrees with the findings of Oyesola and Oladeji (2008) that education is very

important in farming. Its attainment facilitates adoption of innovations.

The Study showed that 26.6% of the farmers had between 5-10 years of farming experience, about 33.9% had between 11-16 years of farming experience. About 23.9% had between 17-22 years of farming experience, about 15.6% had farming experience of 23 years and above. The number of years a farmer has spent in farming is also an indication of the practical knowledge he has acquired in cashew nut production. This result agrees with the findings of Nwaru *et al.* (2006) that the number of years spent in farming business may give an indication of the practical knowledge he has acquired on how to cope with the inherent farm production

processing and marketing problems. The mean farming experience was 18 years.

The study showed that 48.9% of the producers have between 1-4 hectares of farm. About 50% of the farmers have between 5-8 hectares of farm and 3.1% have between 9-12 hectares. The mean farm size was 5 hectares. This is an indication that most of the cashew producers in the study area operate on small scale. The study showed that 93.8 % of cashew nut producers are not members of the cashew farmers association. Only 6.2% are members. This development is very unhealthy for cashew nut production. Agbongiarhuoyi *et al.* (2008) observed that such a unified body would have a good linkage with Government Organization and other farmers Union

Table 1: Socio- Economic Characteristics of the Respondents

| CHARACTERISTICS FREQUENCY PERCENTAGE | | | CHARACTERISTICS FREQUENCY PERCENTAGE | | |
|--------------------------------------|------------|------------|---|------------|--------------|
| Sex | | | Level of education (Years in school) | | |
| Male | 152 | 79.2 | 0 | 73 | 38.2 |
| Female | 40 | 20.8 | 3-6 | 71 | 36.9 |
| Total | 192 | 100 | 7-12 | 11 | 5.7 |
| Age(years) | | | 13 and above | 37 | 19.3 |
| 30-39 | 24 | 12.5 | Total | 192 | 100 |
| 40-49 | 77 | 40.1 | Farming Experience(years) | | |
| 50-59 | 63 | 32.8 | 5-10 | 51 | 26.6 |
| 60-69 | 26 | 13.5 | 11-16 | 65 | 33.9 |
| 70-79 | 2 | 1.1 | 17-22 | 46 | 23.9 |
| Total | 192 | 100 | 23-28 | 13 | 6.7 |
| Mean = 49 years | | | 29 and above | 17 | 8.9 |
| Household size(No of persons) | | | Total | 192 | 100 |
| 3-7 | 142 | 74.0 | Mean farming experience = 8years | | |
| 8-12 | 44 | 22.9 | Farm Size(Ha) | | |
| 13-17 | 5 | 2.6 | 1-4 | 90 | 46.9 |
| 18 and above | 1 | 0.5 | 5-8 | 96 | 50 |
| Total | 192 | 100 | 9-12 | 6 | 3.1 |
| Mean size = 8 persons | | | Total | 192 | 100 |
| Marital Status | | | Mean farm size= 5 years | | |
| Single | 0 | 0.0 | Membership of association | | |
| Married | 170 | 88.5 | Non- membership | 180 | 93.8 |
| Widowed | 19 | 9.9 | Membership | 12 | 6.2 |
| Divorced | 3 | 1.6 | Total | 192 | 100.0 |
| Total | 192 | 100 | | | 0 |

SOURCE: Field survey, 2013

Table 2: Results of multiple regression analysis for the effect of socio-economic variables on Cashew nut production.

| Variables | Linear | Semi-Log | Double Log |
|---------------------|--------------------------|-------------------------|-------------------------|
| Constant | 152.992 (1.28) | 6.336865 (78.01) | -1.058068 (-1.93) |
| Farm size | 312.2 (64.58)*** | 0.208 (36.14)*** | 2.952 (69.12)*** |
| Labour | 29.2001 (3.68)*** | .0133099 (2.47) ** | .1177497 (2.05) ** |
| Capital Invested | .032808 (7.27) *** | .0000272 (8.88) *** | .7860587 (11.76) *** |
| Herb Application | .1008273 (2.26) ** | .0000616 (2.04) ** | -.0050591 (-1.72) * |
| Age | 0.5691 (1.89) | 0.00182 (0.002) | - 0.2575 (0.18) |
| Sex | 191.8314 (2.70) ** | .1257343 (2.61) ** | .0055738 (1.41) |
| Household size | 11.09504 (0.80) | .0023759 (0.25) | .0653276 (1.06) |
| Years in School | -26.26604 (-3.63) *** | -0196788 (-4.01) *** | -.0063988 (-1.76) * |
| Farming experience | -4.092045 (-0.66) | -.004596 (-1.09) | -.0127814 (-0.19) |
| F-ratio (7,184) | 53.07 (0.0000) | 55.17 (0.0000) | 65.08 (0.0000) |
| R ² | 0.6688 | 0.6774 | 0.7123 |
| Adj. R ² | 0.6562 | 0.6650 | 0.7014 |

Source: Computed from Field Survey Data, 2013

N.B: Figures in Parentheses are t-values. *, ** and *** denote 10, 5, and 1 percent level of significance respectively.

Of the three (3) functional forms – Linear, semi-Log and double log fitted, the semi-log functional form was selected as the lead equation. This functional form was chosen as the lead equation based on the magnitude of R², the significance of the overall production function as judged by the F-ratio and the individual coefficients.

The F-ratio of 55.17 is significant at 1% and it shows that all the independent variables jointly determine the effect of socio-economic characteristics on output of cashew nut.

The explanatory power of the specified variables as reflected by R² value was 0.6773, this implies that

the explanatory variables explains the influence of the dependent variables by about 68%. Seven variables (farm size, labour, capital invested, Herbicide application, Age, Sex and years spent in school) were statistically significant. This indicates that these variables have greater influence on the output of cashew nut. This agrees with the submission of Badmus and Yekini (2011) that any increase in these variables will equally translate directly into an increase in the output of cashew nut produced.

Table 3: Cost and Returns in Cashew nut production in Kogi State.

| Items | Amount/farmer(₦) |
|---------------------------------|--------------------------|
| Total Revenue | |
| Cashew nut | <u>77,979.17</u> |
| Total Revenue (TR) | 77,979.17 |
| Variable Cost (VC) | |
| Labour | 10,768.75 (60.33%) |
| Herbicide | 2,793.25 (15.65%) |
| Transport | <u>1,920.83 (10.76%)</u> |
| Total variable cost(TVC) | <u>15,482.81</u> |
| Fixed Cost (FC) | |

| | |
|---|-------------------|
| Land Rent | 2,367.19 (13.26%) |
| Total Fixed Cost (TFC) | 2,367.19 |
| Total Cost (TVC+TFC) | 17,850.00 |
| Gross Margin (TR-TC) | 60,129.17 |
| Net Returns (GM-TFC) | 57,762.98 |
| Gross Ratio (TC/TR) | 0.23 |
| Return on Capital Invested (GM/TC) | 3.37 |

Source: Field Survey, 2013

The cost and returns recorded by the respondents in cashew nut production is shown in Table 3. The return obtained was from cashew nut sales. The average revenue generated per farmer was ₦77,979.17. The cost of production was from the variable cost and the variable cost was made up of cost of labour, herbicide, and transportation while the fixed cost was from land rent.

The cost analysis showed that labour constitutes ₦10,768.75 or 60.33 percent of the total cost of production. This result agrees with the findings of Anozie and Okonkwo (2009) who found out that the cost of labour occupied 61 percent of the total cost of production in their study of cost and returns analysis of pumpkin production in Imo state. The cost of herbicide was ₦2,793.23 or 15.65 percent of the total cost of production. Similarly, the cost of land rent was ₦2,367.19 or 13.26 percent of the total cost of production. Transport was ₦1,920.83 or 10.76 percent of the total cost of production. A confirmation of profitability of cashew nut production is shown by the gross margin of ₦60,129.17. Cost and returns analysis result showed that cashew nut production in the area is viable and profitable with net return of ₦57,761.98 per farmer. The returns on capital invested were 3.37; this implies that for every naira invested in cashew nut production, the farmer made a profit of ₦3.37. This result agrees with Nwaiwu *et al.* (2012) in their study of problems and prospects of large-scale plantain banana production in which they opined that for every one naira invested in plantain banana production, the sum of one naira twelve kobo (₦1.12k) was got as profit. Gross ratio was 0.23; the ratio was less than one, indicating profitability of the farm.

Conclusion and recommendations

Cashew nut production is a profitable business and it has provided means of livelihood to the producers. Profit, however can be maximized if government intervened in the area of making credit facilities available; provide improved variety and other incentives. This would increase their output level and contribute significantly to the income of the producers. There is room for additional increase of output from existing hectares of cashew, if resources are properly harnessed and efficiently allocated. In

line with the findings of the study, the following recommendations are made: Awareness campaign for cashew producers and extension workers are necessary in order to train them in the best agronomic practices, post-harvest handling and marketing. Assistance should be given to farmers to obtain credit facilities. Distribution of improved and disease resistant cashew varieties to farmers. There is also need for institutional support for organizations, agencies and ministries related to cashew production. These include ministry of Agriculture, ADPs, CRIN etc. Small and medium scale industries credit scheme to promote industrial processing of nuts in the state should be considered. Provision of adequate extension and supportive services of government with a view to improving cashew production technique.

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