

RESEARCH ARTICLE

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Socio-economic Determinants of Output of Groundnut Production in Etsako West Local Government Area of Edo State, Nigeria.PETER A. EKUNWE^{1*} CHRISTOPHER. O. EMOKARO² AND GRACE A. AIGBA¹¹Department of Agricultural Economics and Extension Services, Faculty of Agriculture and Agricultural Technology, Benson Idahosa University, Benin City, Edo State, Nigeria.²Department of Agricultural Economics and Extension Services, Faculty of Agriculture, University of Benin, Benin City, Edo State, Nigeria**Abstract**

The study examined the economics of groundnut production in Estako West Local Government Area of Edo State. The objectives of the study were to examine the socio-economic characteristics of groundnut producers, determine the costs and returns of groundnut production, identify the constraints faced by groundnut farmers and analyze the socio-economic factors determining groundnut production in the study area. Primary data were collected with the aid of well-structured questionnaire administered to 60 groundnut farmers using a simple random sampling technique. The result of the data analysis showed that majority of the farmers were male (78%) with an average family size of nine persons per family. Also 50% of the respondents acquired formal education. Results obtained also showed that the gross farm income per hectare was ₦(Naira)84,000 (€403.8) and the net farm income was ₦(Naira) 41,550 (€199.8) per annum respectively. The return per naira invested was 0.98, indicating that the farm business realized a return of 98 kobo for every ₦ (Naira)1.00 invested in groundnut production. Result obtained from the multiple regression analyses indicated that the Double log functional form provided the best fit. The coefficients of farm size, farmer's experience, labour and ages were positive while family size was negative. The regression model is significant at 1% level as shown by F - statistic. The R² value of 0.965 indicated that 96.5% of the variability in groundnut production was accounted for by the various independent variables used. Finally, the major constraints faced by the farmers were inadequate finance, unavailability of labour, high incidence of pests and diseases, unfavourable climatic conditions and high cost of transportation. It is therefore recommended that effort should be channelled towards ameliorating these constraints.

Keywords: Edo State, Gross farm income, Groundnut, Return per Naira, Nigeria, Socioeconomic Determinants.**1. Introduction**

Groundnut (*Arachis hypogaea* Linn), is the 13th most important food crop of the world. It is the world's 4th most important source of vegetable protein. Groundnut seeds contain high quality edible oil (50%), easily digestible protein (25%) and carbohydrate (20%). It is grown over an area of 26.4 million hectares with a total production of 36.1 million tonnes and an average productivity of 1.6 metric tons per hectare in the whole world [2] Groundnut is grown in nearly 100 countries with China, India, Nigeria, USA, and Indonesia and Sudan as major producers [9], estimated that Nigeria's cultivated area under groundnut cultivation is about 1.0 to 2.5 million hectares annually and yield in the range of 500 – 3000 kg/ha.

Before the world war, Nigeria's groundnut export figured prominently in world trade, accounting for 29% of Africa's export and 12% of the world export.

In the 1950s, Nigeria contributed 50% of Africa's export and 30% of the world export. In the early 70s, Nigeria accounted for 41% of the total groundnut production in West Africa [1]. There has been a steady decline in production. [7] Attributed the decline in groundnut production to the discovery of petroleum in the Southern part of Nigeria, groundnut rosette epidemic, drought and lack of organized inputs and marketing. The persistent decline in groundnut production over several decades has generated great concern for the Nigerian Government which has resulted in the evolution of various means of revitalizing the production through research for impaired yields.

Despite these numerous crop improvement practices and vast resources of land and labour as reported by [8] there seem to be inadequate supply of groundnut to meet the demand of the teeming population of Edo State. Production of groundnut is mainly undertaken by smallholder farmers for

subsistence, using traditional methods and employing low yielding variety with low yield per hectare per head. There is therefore a serious need to reverse this negative trend, with a view to improving groundnut production. This study therefore sought to examine the economics of groundnut production in Estako West Local Government Area of Edo State. The study attempted to provide answers to the following questions: what are the problems faced by groundnut producers in Edo State? What is the current level of output of groundnut production in the area of study? What is the effect of the social-economic characteristics of groundnut farmers on the level of groundnut production in Edo State? How profitable/viable is groundnut farming as a business venture in the study area? The specific objectives were to:

- Examine the socio-economic characteristics of groundnut producers in the study area.
- Determine the costs and return of groundnut production in Etsako West Local Government Area of Edo State.
- Determine the effect of socio-economic characteristics of farmers on groundnut production in the area of study.
- Identify constraints faced by groundnut farmers in the area of study.

2. Materials and Methods

Area of Study:

This study was carried out in Etsako West Local Government Area of Edo State which is located in the Northern part of the State. Edo State is located in the South-South Geo-political zone of Nigeria. According to the National population census of 2006, Edo State has a population of 3,218,332 people with an annual growth rate of 2.7%. It has a land mass of 19,794 square km lying between latitudes 5° 44' N and longitudes 7° 34' N, 5° 4' E and 6° 45' E. Edo State has a tropical climate characterised by two distinct seasons: the wet and dry seasons. The temperature averages about 25 °C (77 °F) in the rainy season and 28 °C (82 °F) in the dry season. The climate is humid in the South and sub-humid in the North. The main crops grown are rubber, oil palm, cocoa, yam, cassava, maize, rice and plantain, groundnuts sugar cane, cashew, oil palm (and its derivative products); soya beans, tomatoes, cotton and tobacco are also produced. Fruit like pineapples, coconuts, oranges, avocados, as well as green leafy vegetables, all grow

abundantly in the State. In Etsako West the major crop grown are groundnuts, rice, beans, and maize.

Data Collection Method:

The data collected for this study were obtained from primary and secondary sources. The primary data were collected for this research through scheduled interviews and observations, using a well-structured questionnaire. Secondary data on the other hand were collected from relevant literature, textbooks etc. The primary data were collected between January 2012 and May 2012, through scheduled interview with respondents and with a well-structured questionnaire. A total of 68 copies of the questionnaire were administered to respondents but only 60 were found to be valid enough for further analysis, giving a response rate of 88%.

Sampling Technique:

The simple random sampling technique was used to select 68 respondents from the sample frame provided by Agriculture Development Project (ADP) and Groundnut Co-operative Farmers Association in the study area.

Data Analysis:

The socio-economic characteristics of groundnut farmers and constraint faced by the farmers in the study area were examined using descriptive statistics such as frequency counts and percentages. The variables included sex of farmers, age of farmers, level of education of farmers, household size, years of farming experience and constraints.

The costs and returns of groundnut production in the study area was analysed using costs and return analysis adopted by [2]

Theoretically, the model is expressed as;

$$NFI = GFI - TC (VC + FC) \quad (1)$$

and

$$R/N = NFI/TC \quad (2)$$

Where: NFI = Net Farm Income

GFI = Gross Farm Income

VC = Variable Cost

FC = Fixed Cost

TC = Total Cost

R/N = Return per naira

Data were also analysed with the use of regression analysis. The linear, semi-log and double-logarithmic functional forms were tried out and the model which gave the best fit on the bases of economic, statistical and econometric criteria was selected. The implicit form of the function is

$$Y = f(X_1, X_2, X_3, X_4, X_5, U_1) \quad (3)$$

Where, Y = groundnut output (kg)

X₁ = farm size (H_a)

X₂ = Family size (Persons)

X₃ = Farming experience (in years)

X₄ = Labour input (man day)

X₅ = Age (in years)

b₀ = Constant term

b₁ – b₅ = Regression coefficient to be estimated

U₁ = Error term

$$Y_1 = \beta_{01} + \beta_{11}X_1 + \beta_{21}X_2 + \beta_{31}X_3 + \beta_{41}X_4 + \beta_{51}X_5 \quad (4)$$

$$\ln Y_2 = \beta_{02} + \beta_{12}X_1 + \beta_{22}X_2 + \beta_{32}X_3 + \beta_{42}X_4 + \beta_{52}X_5 \quad (5)$$

$$\ln Y_2 = \ln \beta_{02} + \beta_{12} \ln X_1 + \beta_{22} \ln X_2 + \beta_{32} \ln X_3 + \beta_{42} \ln X_4 + \beta_{52} \ln X_5 \quad (6)$$

The a priori expectation is that X₁ – X₅ will have a positive effect on production.

Depreciation value:

The depreciation values for the farm implements use were computed using the straight line method of depreciation.

Depreciation = cost – salvage value/number of years.

3. Results and Discussion

Socioeconomic Characteristics of Groundnut Farmers:

The socioeconomic characteristics of groundnut farmers in Estako East Local Government Area of Edo State, is presented in Table 1. The results show that out of the 60 groundnut farmers, 49(78%) were males, while 11(22%) were females. The result suggests that more males participated in groundnut farming than females in the study area. Majority of the groundnut farmers sampled were within the age range of 41-60 years. Out of the 60 groundnut farmers, 18 (30%) were in the age range of 21-40 years, 32 (53.3%) were in the age range of 41-60 years, and 10 (16.6%) were within the age range of above 60 years. The average age of the respondents was 48years, indicating that groundnut farmers were still in their active years of production. This is in consonance with the report of [10], that the age within (30-50) represents an active (productive) age in agriculture. The marital status of groundnut farmers in the study area is also represented in Table 1. The result showed that out of 60 groundnut farmers surveyed 50 (83.3%) were married, two (3.3%) were single, five (8.3%) were widows and three (5%) were divorced. Out of the 60 farmers sampled, 9 (15%) had a family size within the range of 1-5 persons, 21 (35%) had a family size within the range of 11-15persons and 30 (50%) had a family size within the range of 6-10 persons. On the average, the family size of the respondent was nine persons.

Table 1: Socioeconomic Characteristics of Groundnut Famers in the Study Area.

	<i>Item</i>	<i>Frequency</i>	<i>Percentage</i>
Sex	Male	49	78
	Female	11	22
Age	Less than 21	0	0
	21-40	18	30
	41-60	32	53.3
	Above 60	10	16.6
Marital statur	Married	50	83.3
	Single	2	3.3
	Widowed	5	8.3
	Divorced	3	5
Household size	1-5	9	15
	6-10	30	50
	11-15	21	35
Education	No formal education	30	50
	Primary education	15	25
	Secondary education	10	16.7
	Tertiary education	5	8.3

Source: Computed from Field Survey Data, 2012.

Table 2: Estimated Costs and Returns per Hectare for Groundnut Production

<i>Costs and return</i>	<i>Output (kg)</i>	<i>Unit price Naira/kg</i>	<i>Cost and return naira</i>
Costs			
Total variable cost (TVC)			36,725
Total fixed cost (TFC)			5.725
Total cost (TC) (TC = TCV + TFC)			42.50
Returns			
Gross Income (GFT)	600	140	84,000
Net Farm Income (NFI)			41,550
Return per Naira (R/N)			0.98 (98%)

The result suggests that majority of the groundnut farmers surveyed were married. The educational level of the farmers surveyed showed that 30 (50%) had no formal education, 15 (25%) had primary education, 10 (16.7%) had secondary education and 5 (8.3%) had tertiary education. This suggests that most of the farmers were not literate. It means that of most the farmers will not be able to communicate or discuss their problems with extension officers effectively, when the need arises. Thus, they would encounter difficulties receiving or adopting new production techniques, thereby making them do things in the same old way and getting the same result, with its resultant negative effect on their output.

Costs and Returns:

The mean cost of groundnut production per hectare, with an average variable cost of ₦31, 000 and average fixed cost of ₦(Naira)5,725 giving an average total cost of ₦36, 725, is presented in Table 2. The mean gross income was estimated as ₦(Naira)84,000 per hectare and the mean net farm income was ₦(Naira)41,500 per hectare, indicating that the farm business realized a return per naira invested of 98kobo for every ₦(Naira)1.00 invested in groundnut production.

Table 3: Estimated Effect of Socio-Economic Characteristics of Farmers on Groundnut Production

Variables	Linear	Semi log	Double log
Constant			
Coefficient	3.666596**	3.141135*	1.121809*
Standard error	(1.718182)	(0.038193)	(0.080546)
Farm size			
Coefficient	0.889107	0.013529	0.081922
Standard error	(0.118550)	(0.002635)	(0.013479)
Family size			
Coefficient	-0.499835*	0.009936*	-0.008269*
Standard error	(2.617034)	(0.058174)	(0.010199)
Farming experience			
Coefficient	0.794519*	0.012833*	0.047710*
Standard error	(0.118802)	(0.002641)	(0.010078)
Labour			
Coefficient	1.102885*	0.016399*	0.070955*
Standard error	(0.135146)	(0.003004)	(0.009626)
Age			
Coefficient	0.970817*	0.016513*	0.702668*
Standard error	(0.024785)	(0.000551)	(0.019141)
R-squared	0.9711	0.9509	0.9652
Adjusted R-squared	0.9685	0.9463	0.9620
F-statistic	364.1889*	209.2315*	300.3124*
Prob (statistic)	0.0000	0.0000	0.0000
S.D. dependent	10.0226	0.1706	0.1706
Akaike info criterion	4.0834	-3.5293	-3.8757
Durbin-Watson	2.0810	2.0587	1.9813

Source: Computed from Field Survey Data, 2012.

*, **, = Significant at 1% and 5% levels respectively.

Table 4: Constraints Faced by Groundnut Farmers in the Study Area

Constraints	Frequency	Percentage
Financial inadequacy	20	33.3
Unavailability of Labour	18	30
High incidence of Pests and disease	10	16.7
Unfavourable Climate	7	11.7
Transportation Problems	5	8.3
Total	60	100

Source: Computed from Field Survey Data, 2012.

Groundnut production is therefore a profitable business, with a good net return on investment in the study area. These values compare favourably with profitability indices ₦ 32,320h⁻¹/season (gross margin) and 0.85 (net income ratio), reported by [11], for cowpea production in Osun State. The values are however, much lower than the return per naira invested of ₦ 1:91 reported by [6], for groundnut production in Kano State

Socio-economic Determinants:

The estimated effect of socio-economic characteristics of farmers on groundnut production is presented in Table 3. The F-ratio for each functional form is significant at 1%. This implies that each of the functional form is adequate and could be used for further analysis. Though, the linear model had a better R-square and F-statistic than the other functional forms the double log model was chosen as the best fit based on its lower Akaike Information Criterion (AIC) value of -3.8757, which is a better criterion for a non-nested model, and its Durbin-Watson value of 1.981375 which is approximately two (2), implying that there was no serial correlation among the various independent variables analysed.

All the coefficients, except that associated with family size bore a priori signs. The coefficient of farm size, farmers experience, labour and age were positive as expected and were significant at 1%. This implies that increases in the usage of these positive coefficients will result to an increase in groundnut production, while the coefficient of family size which is negative implies that a unit increase in family size will result in reduction of groundnut production by 0.008%. The R² of 0.965 indicates that 96.5% of the variability in groundnut production is accounted for by the various independent variables used. Constraints faced by Groundnut Farmers in the Study Area.

From the result of this study the following constraints were identified among groundnut farmers in the study area as presented in Table 4. Financial

inadequacy was listed as the most important constraint, with a frequency of 20 (33.3%) followed by unavailability of labour, high incidence of pests and diseases with frequencies of 18 (30%) and 10 (16.7%) respectively. Unfavourable Climate and transportation problems were listed as the least of the identified constraints faced by the farmers.

4. Recommendation and Conclusion

This study examined the economics of groundnut production in Etsako West Local Government Area in Edo State. Despite the various problems faced by groundnut farmers in the study area, groundnut production is profitable with revenue of 98 kobo for every ₦1.00 invested in groundnut production. Farmers were however faced with constraints of financial inadequacy, unavailability of labour and high incidence of pests and diseases. It is therefore recommended that effort should be channelled towards ameliorating these constraints. All stakeholders are encourage to play their part in ensuring the survival and sustainability of groundnut production in Edo State

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