



**ANALYSIS OF SESAME PRODUCTION IN AGAIE LOCAL GOVERNMENT AREA
OF NIGER STATE, NIGERIA**

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ABSTRACT

Recently there has been a sharp decline in sesame production in Niger State which may affect the livelihood of the farmers as well as production of the enterprise. The study therefore carried out an analysis of production of sesame in Niger State to examine the reasons for the decline in production as well as the current profitability of the enterprise. The socio-economic characteristics of sesame farmers in this study describes and examine the profitability of sesame production. Factors affecting sesame production in the study area were also highlighted. Three stage sampling technique was used for this research. A purposive selection of Agaie Local Government was used at the first stage due to it predominance of sesame production in the area. The selection of five 5 villages from the local government area was randomly in the second stage, while the third entails a random selection of 120 sesame farmers from the selected village. Primary data collected through survey method were evaluated using a descriptive statistics, costs and returns, and multiple regressions model. The socio-economic characteristics results show that 74% of sesame farmers were within the age bracket of 15-45% years. 63% were literate, 94% were married and 53% had 1-2 hectares of farmland. Also, 82% of the farmers had no access to credit and 54% belong to cooperative society. The result of the costs and return analysis shows that sesame production is profitable in Agaie LGA with a net farm profit of ₦8,385.53

Keywords: sesame production, production analysis, regression model.

INTRODUCTION

Sesame (*Sesamum indicum L.*) also called the queen of oil is a world famous seed. It is an ancient oilseed of India. Sesame contains approximately 50% of oil as compared to groundnut 45% of oil, soybean oil 40%, mustard oil 34% and sunflower oil 45%.

Sesame seed is enrich with protein, fat, fibre, carbohydrates, and as well as some mineral. This oil seed is popular for its ability to resist pressure even after elongated exposure to the sun. (Global Agri Systems, 2010). The seed has an excellent nutritional value to soybean and oil rich similar to groundnut (NAERLS, 2010).



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(Oplinger ES, *et al* 1990), affirm that sesame oil could be used as a preservative for perfume in the factory as well as in pharmaceuticals. Pharmaceuticals use the oil as ointment for the treatment of skin infections, could be used for the manufacturing of all kinds of soaps. Sesame young crop leaves are also use for vegetable soup in most Africa countries. The roasted seeds are sprinkled in soups and consume after mixing with sugar (Kafiriti EM, *et al* 2010).

Among the world largest producers of sesame, India is rank first in the world (23%) and Myanmar is rank second largest producer of sesame in the world exporting (25%) of total production between 5 to 6 metric tons annually (Anonymous, 2016). But the productivity is only 409kg/ha which is lower than most of the sesame growing countries (Anonymous, 2013). In general, average productivity of sesame continues to decline than expected from agricultural technology for the last 40 years, mainly due to its cultivation on marginal lands, poor management practices and low input application (Kumar *et al.* 2014) Nigeria stands seventh position among largest producer of sesame next to Ethiopia and Sudan respectively in Africa. Nigeria presently produces approximately 300,000 tons of Sesame with states like Jigawa, Nassarawa, Benue and Taraba as the leaders. An approximate of 26 States are into sesame production, and the expectation is to increase the production in other to meet the demand of the world. (AgroNigeria 2016).

Little or less attention is given in recent time into the investigation which is the reason for the study. The results of the factors militating sesame production in the study area highlighted education and amount of credit utilized were factors significant affecting the production of sesame in the study area. These factors responsible for low production in the area by farmers when checked could aid improve the standard of this farmers in the affected area.

METHODOLOGY

Study Area

This study was carried out in Agaie Local Government Area (LGA) of Niger State, Nigeria. The LGA shares boundary with Lapai LGA in the East, Katcha LGA in the West, Paiko LGA in the north and Kogi LGA in the south with River Niger as demarcating line.



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The land area of Agaie is 874 Square miles with Longitude 60° 30' E – 70° 30'E and Latitude 80° 30' E - 90° 00' E of the Equator. Agaie is positioned in between Lapai and Bida area of Niger. Rainfall concentration somewhere in July and August with 1,600mm in the south with 1,200mm in the North with duration of 150 -210 days and a temperature of 32°C.

Data Source and Sampling Method

Primary data collected through interview schedule with the help of a well-structured questionnaire for the study. The socio-economic data collected include information on age, sex of the household heads, the size of household, the level of education, farm size access to extension service, experience in farming and as well as membership of the cooperative organizations. The information on farm production such as the size of land, quantities of fertilizer used, quantities of seed, quantities of agrochemical, labour type, data like output and input prices of sesame were also collected.

The study adopted three stage sampling technique. First stage entails purposive selection of Agaie local government area due to prevalence of sesame production in the area. Second stage involves the random selection of five (5) villages from the selected Local Government Area. The third was a random selection of twenty four (24) farmers in the selected villages to give a total sum of 120 sampled farmers for the study.

Analytical Technique

Descriptive statistics, such as mean and frequency distribution as well as costs and returns and regression analysis were used for the study.

Net Farm Income

The model for the Net Farm Income is expressed as follows:

$$NFI = TR - TVC - TFC$$

Where:

NFI = Net Farm Income

TR= Total Revenue

TVC= Total Variable Cost

TFC = Total Fixed Cost



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Regression Analysis: multiple regression

Regression model is used to assess the production function of sesame production in the study area.

- $Y=f(X_1,X_2,X_3,X_4,X_5,X_6 X_7 e)$
- Where:
- Y =output of sesame production in kg
- X_1 =Age (years)
- X_2 =household size
- X_3 =Education (years)
- X_4 =Farm size (ha)
- X_5 =Access to extension services (1=have access & 0=no access)
- X_6 =Access to credit facilities (1=have access & 0=no access)
- $X_7 = Age^2$
- E = Stochastic error term

iv. Production Function Estimate: is used to isolate the factors militating sesame production in the study area.

$$Y=f(X_1,X_2,X_3,X_4,X_5,X_6 X_7 e_i)$$

- Where
- Y = output of sesame production (kg)
- X_1 = Labour (manday)
- X^2 = Farm size (ha)
- X^3 = Seed (kg)
- X^4 = chemical (liters)
- X^5 = Age
- X^6 = Age^2



RESULTS AND DISCUSSION

Descriptive Analysis

Table 1, shows 74 percent of the farmers are within the age range of 15-45years, which basically implies that sesame farmers are in their active years. 93 percent of the farmers are male. This agrees with the fact findings of (Godwin *et al.* 2009). and (Ahmadu *et. al* 2011).

Table 1: Socio-economic characteristics of small scale farmers

Variables	Frequency	Percentages
Age (years)		
15-30	47	39.2
31-45	42	35
46-60	20	16.7
>60	11	9.2
Gender		
Male	111	92.5
Female	9	7.5
Marital Status		
Married	113	94.2
Single	4	3.33
Divorce	1	0.8
Separate	2	1.7
Education		
Quranic	44	36.6
Primary	21	17.5
Secondary	34	28.4
Tertiary	21	17.5
Total	120	100

Source: Field survey, 2016

Table 2, shows the production of sesame and the analysis of costs and returns in the study area. The seed, labour, chemical, fertilizer, sack and transportation all constitute the variable costs. The cost of production of the variable constitutes approximately 86 percent of the production cost. While Labour account for 77 per cent of the sum total variable cost. The total variable cost was ₦20,227.64 with the average return per hectare was ₦32,013.30 with a gross margin of ₦11,785.66. The depreciated value of fixed items adds up to ₦ 3, 400.10 and the net farm income was ₦8, 385.53. This result shows a positive net farm return for sesame production in the area of our study. The return on capital employed was 40 kobo, signifying that for every



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invested ₦1 in the enterprise there is a return of 40 kobo. This confirm that sesame is profitable in the area of study.

Table 2: Costs and returns for sesame production

Items	Amount/hectare(₦)	Percentage
Labour	15,585.60	66
Seed	2,259.44	9.6
Chemical	1,088.90	4.6
Fertilizer	320.7	1.4
Transport	653	2.8
Sack	320	1.3
Total variable costs(TVC)	20,227.64	85.7
Depreciated value of fixed cost		
Cutlass	1,066.70	4.5
Hoe	666.7	2.8
Sprayer	1,666.70	7
Total depreciated value of fixed cost	3400.1	14.3
Total Cost(TFC+TVC)	23627.74	100
Gross Income (GI)	32,013.10	
Net Farm Income(GI - TC)	8,385.53	
Gross Margin (GM) (GI-TVC)	11,785.46	
Return per Capital invested (NFI/TC)	0.4	

Source: Field survey, 2016

In table 3, the regression is use in other to estimate the production function of sesame production in the area of study. The lead equation is double log functional form, it was selected on the magnitude of standard error, signs of the coefficients, t-value, magnitude of coefficients, magnitude of coefficient of multiple determination (R^2) and the F-value. The equation is specified as follows: $Y=b_0+0.154X_1+0.136X_2+0.304X_3+0.215X_4 - 0.192X_5 +0.085X_6+e_i$.

The coefficient of multiple determinations is 0.677, this shows that about 68% of the variation in the output of sesame was described by the regression model which are independent variables. The remaining 32% is attributed to non-inclusion of some of the vital descriptive variables as well as the estimation of errors. All the fitted variables (labour, seed, chemicals and farm size) had positive sign. The coefficients of seeds and size of farm were significant at 5%.



Table 3 Regression analysis for the production of sesame in the area of study

Variables	Linear			Semi-Log			Double Log		
	coefficient	standard errors	t-values	coefficient	standard errors	t-values	coefficient	standard errors	t-values
Labour	0.263	0.039	6.724***	14.402	6.826	2.110**	0.154	0.086	1.799
Farm size	0.439	0.267	1.647	8.213	5.275	1.557	0.136	0.066	2.046
Seed	-0.01	0.076	-0.132	6.426	7.904	0.813	0.304	0.099	3.062
Chemical	0.738	0.430	1.715	8.631	10.095	0.855	0.215	0.127	1.692
Age	0.619	0.450	1.375	12.731	20.939	0.608	0.192	0.264	0.728
Age2	-0.007	0.005	-1.481	-2.615	9.868	-0.265	-0.085	0.124	-0.688
R2			0.63			0.629			0.677
F			32.075			12.130			38.787
Adjusted R2			0.610			0.363			0.660

Source: Field survey, 2016

***denote significance at 1% while ** denote significance at 5%

The factors affecting sesame production in the researched area remained identified using multiple regression model (Table 4). The study hypothesized six variables as factors affecting sesame production. These factors were, the size farm, access to credit, household size, and age of farmers, years of schooling and access to the services of extension agents. Education and access to credit facility were the only significant factors affecting the production sesame in the study area.



Table 4: Factors influencing sesame production in the study area

variables	coefficients	standard error	t-value
Farm size	0.493	0.307	1.604
Access to credit	8.318**	0.000	2.095
Household size	-0.743	0.421	-1.764
Age	0.341	0.529	0.643
Education	0.332***	0.069	4.839
Access to extension	-0.266	2.799	-0.095
Age ²	-0.002	0.006	-0.34
R ²	0.495		
F	15.662		
Adjusted R ²	0.463		

Source: Field survey, 2016

***denote significance at 1% while ** denote significance at 5%

CONCLUSION AND RECOMMENDATION

This study analysis the production of sesame in Agaie Local Government Area of Niger State. Factors affecting the production of sesame were identified using multiple regression model. These factors are farm size, access to credit facilities, the size of household, years of education and access to extensions services among others. Education and access to credit facilities were significant factors affecting the production of sesame. The study therefore recommend the intensification in the use of some selected positive variables will add some significant increase in the output of sesame in the study area.

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