Economics of Groundnut Production in Dambatta Local Government Area of Kano State, Nigeria

Godfrey Onuwa[1*], Ibiyinka Ademiluyi[1], Grace Yitnoe[2]

[1]*Department of Agricultural Extension and Management, Federal College of Forestry, Jos, Plateau State, Nigeria*
[2] *Entrepreneurship and Consultancy Unit, Federal College of Forestry, Jos, Plateau state, Nigeria*
[*]*Corresponding author*

***Abstract*: This study analyzed the economics of groundnut production in Dambatta Local Government Area of Kano state, Nigeria. Multi-stage sampling technique was adopted. Primary data were collected using structured questionnaires. Descriptive and inferential statistics were used to analyze the data collected. The results of the study revealed that the socioeconomic factors of the respondents significantly affected groundnut production in the study area. The gross margin and net farm income were estimated as ₦59,850/ha and ₦47,350/ha respectively. The estimated benefit cost ratio was 1.75. A gross ratio of 0.57 was recorded (a ratio of <1 is desirable). The estimates of operating and the fixed ratios were 0.46 and 0.11respectively. The estimate of return on investment was 0.75. The coefficient of multiple determinations (R^2) was 0.763 implying that 76% of the variation in the output of groundnut was accounted for by the variables in the regression model. The estimate of elasticity of production is 0.675, suggesting decreasing returns to scale. Also, the constraints of production identified significantly affected groundnut production. Cooperative formation, supportive farm policies, extension delivery services, credit access, efficient supply of subsidized production inputs, processing and storage facilities and technologies to the farmers are strongly recommended.**

***Keywords*: Farm budget analysis, groundnut yield, input-output relationships, production constraints, socioeconomic factors**

I. INTRODUCTION

Groundnut (*Arachis hypogaea*) is a member of the genus *Arachis* in the family *leguminosae.* As a leguminous crop, it has high nutritional potentials; it contains high quality edible oil (50%) protein (25%) and carbohydrate (20%). China, India, Nigeria, USA, Indonesia and Sudan are major producers of groundnut ([I]; [II]). It is the 6th most important oil seed crop in the world ([III]; [IV]). It is a cash crop providing income and livelihoods to farming households in most developing and developed countries [V]. The groundnut sub-sector provided the key opportunity for the agro industrial development of Nigeria and contributed to the country's foreign exchange earnings. Groundnut export accounted for about 70% of total export earnings in Nigeria, making it the country's most valuable single export crop ahead of other cash crops like cotton, oil palm, cocoa and rubber, it has contributed significantly to the development of the nation's GDP [VI].In some cases, groundnut plant is being referred to as "multipurpose crop". Groundnut kernels are consumed directly as raw, roasted or boiled. Oil extracted from the kernels is used as culinary oil. The cake obtained after pressing out the oil is used in feeding livestock. Groundnut kernel also provides nutritious fodder (haulms) to in livestock rations. Also the leaves and straws are used in feeding livestock in their green and dry forms or in making chipboard for use in joinery ([II]; [VII]; [VIII]). It is also processed into or included as an ingredient in a wide range of other products and local diets which includes; groundnut paste, groundnut cake (*kulikuli)*, groundnut porridge made with millet (*kunun gyada)*, groundnut candy *(kantun gyada)* and groundnut soup (*miyar gyada)*. The shells are used for fuel by some local oil factories or they are sometimes spread on the field as a soil amendment. The uses of groundnut plant make it an excellent cash crop for domestic markets as well as foreign trade in several developing and developed countries [III]. Groundnuts are also important in the confectionary trade and the stable oil is preferred by the deep-frying industries. The oil is also used to make margarine and mayonnaise. Confectionary products such as snack nuts, sauce, flour, peanut butter and cookies are made from high quality nuts of the crop. The crop, despite its names and appearances, it is not considered as a nut but rather a legume with high oil and protein content [II]. The crop is essentially cultivated in both tropical and sub-tropical countries. Groundnut believed to be the most popular and widely cultivated legume in Nigeria because of its adaptation to varied climatic conditions [IX]. In Nigeria, groundnut is either cultivated sole or in mixtures with other crops like maize, sorghum, millet or cassava; the leading producing states include Niger, Kano, Jigawa, Zamfara, Kebbi, Sokoto, Katsina, Kaduna, Adamawa, Yobe, Borno, Taraba, Plateau, Nasarawa, Bauchi, and Gombe States [X]. The popular varieties in Nigeria are Kano local, Kano 50, Castle cary, Samnut 21, Samnut 22, and Samnut 23 (rosette resistant varieties) [XI]. [XII] Reported that developing countries constitute 94% of the global production of groundnut. It further reported that the production of the crop is concentrated in Asia and Africa, where the crop is mostly grown by small-scale farmers under rain-fed conditions with limited inputs. Groundnut is grown on 26.4 million hectares worldwide, with a total estimated output of 37.1 million metric tons. Nigeria was the third highest producer of groundnut in the world after China and India with a production of 16.1million metric tons, 6.9million metric tons and 2.9million metric tons respectively in 2011. More than 2 million hectares are planted to

groundnuts annually producing variable pod yields ranging from 100-3500 kg/ha [XII].

It is estimated that over 80% of the farm holdings in Nigeria are in subsistent scale. In developed countries, groundnut yield is improved through the development, dissemination and efficient use of resources coupled with improved varieties whose yield range from 2.8 to 6.1 tons per hectare. According to National Agricultural Extension Research and Liaisons Services [X] groundnut yield in Nigeria has generally been poor due to a combination of several factors despite the availability of productive land potentials. Studies have shown that, there is a shortfall of over 80% of groundnut requirement for both domestic consumption and by agro industries involved in processing and marketing of the commodity [XIII]. This large gap between actual and potential yields is also attributable to factors such as; poor access to improved varieties for particular ecologies, inappropriate crop management practices, pests and diseases, climate variability, poor access to production technology and inputs, crop improvement practices, increased non-supportive farm policies and inadequate market linkages have negatively impacted on groundnut production [XIV]. Groundnut production in Nigeria is mostly at subsistent level, using traditional methods and employing low yielding varieties with low yields per hectare ([IX]; [VIII]). There is therefore a serious need to reverse this negative trend, with a view to improving groundnut production. This is in-spite of efforts by various research institutes such as The Institutes for Agricultural Research, (IAR) Samaru, and Zaria. National Agricultural Extension Research and Liaisons Services (NAERLS) and International Crop Research Institutes for Semi-Arid Tropics (ICRISAT) in developing improved species and management practices that will ensure sustainable production of the crop. It is important to find out the extent these factors influence the efficiency levels of the farmers so that specific policies may be designed to step up their output level. Groundnut pod yields from farmer's field are low, averaging about 500 kg per ha, less than the potential yield of 3000 kg per ha. This yield deficit is of concern and it against this backdrop that we seek to analyze the following specific objectives;

i. describe the socioeconomic characteristics of the respondents;
ii. estimate the cost and returns of groundnut production;
iii. determine the input and output relationship of groundnut production;
iv. estimate the returns to scale of groundnut production; and
v. Identify the constraints of groundnut production.

II. METHODOLOGY

Study Area: Dambatta is situated in northern part of Kano State. It is enclosed between latitude 12º25'N and longitude 8º35'E with a land mass of 2732km2. It has a population of 207,968 and a growth rate of 2.4% per annum [VI]. It has a land mass area of 305.51km2. Average daily temperature and rainfall are 26.8ºC and 700mm respectively [VI]. Most of the populations are small scale arable farmers; moreover, villages that are located close to the nearby oasis irrigation project engage in the production of rice, pepper, onions, tomatoes and wheat. In addition, they rear livestock like; goats, sheep and poultry.

Sampling Technique: Multi-stage sampling technique was employed in the selection of respondents for the study. In the first stage Dambatta local government area was purposively selected. The second stage involved the systematic random selection of four districts in the study area out of ten (10) due to the prevalence of groundnut production in these districts, which included; Dambatta yamma, Dambatta Gabas, Ajumawa and Gwarabjawa and the final stage involved the random selection of 2%(0.02) from the sample frame of 5,982 groundnut famers provided by the Agricultural Development Project (ADP) and Groundnut co-operative farmers association in the selected districts, hence giving a sample size of 119 groundnut farmers.

Data Collection: A well-structured questionnaire designed in line with the objectives of the study was used for the collection of data. The data collected for this study were obtained from primary sources. A total of 119questionnaires were administered to the respondents. However, only 80 questionnaires were retrieved from the respondents and used for the purpose of this study.

Analytical Techniques: Descriptive and inferential statistics were used to analyze the data collected. Descriptive statistics (mean, frequency distribution and percentages) were used to analyze objective i and v. Costs and return analysis and profitability ratios were used to achieve objective ii. Regression analysis (Double-log Production function model) and production elasticity were used to analyze objectives iii and iv respectively.

Costs and Return Analysis: The costs and returns analysis was used to determine the net farm income per hectare, as adapted by [IX] to analyzed objective ii, explicitly the farm budgeting model used is expressed as follows:

$$N.F.I=TR-TC\ldots.. (1)$$

Where; Net Farm Income (NFI) (₦); Total Revenue (TR) (₦); Total Cost (TC) (₦)

$$TR = P_Y.Y\ldots... (2)$$

Where; P_Y = unit price of output produced (₦); Y = quantity of output (kg)

$$TC =TVC+TFC \ldots.. (3)$$

Where; TVC=total variable cost (₦); TFC=total fixed cost (₦)

$$TVC = P_X. X_I\ldots.. (4)$$

Where; P_X = unit price of variable input (kg/liter); X_I = quantity of I_{th} input (kg/liter)

TFC = farm improvements +depreciation cost of farm implements, assets etc. (₦).

The depreciation values were computed using the straight line method of depreciation;

Depreciation (₦) = cost – salvage value/number of years …….. (5)

Profitability Ratios: To determine the financial performance and sustainability of groundnut production the operating, fixed and gross ratios and were estimated as well as the return on investment (ROI) and presented as follows:

Operating Ratio (O.R) =TVC/TR ….. (6)

Where; TVC=total variable cost, TR=Total Revenue

Fixed Ratio (F.R) = TFC/TR ….. (7)

Where; TFC=total fixed cost, TR= Total Revenue

Gross ratio (G.R) = T.C/T.R …… (8)

Where; TC=total cost, TR= Total Revenue

Return on investment (ROI) = TR/TC …… (9)

Where; TR = Total Revenue, TC=total cost

Regression Analysis: Inputs and output relationship in groundnut production was analyzed using of regression analysis. The double-log function gave the best fit and was chosen as the lead equation on the basis of the number of significant variables, magnitude of the coefficients, statistical and econometric criteria and was used to analyze objective ii. The model in its explicit form is stated as follows:

$$LogY = b_0+b_1logX_1 + b_2logX_2 + b_3logX_3 + b_4logX_4 + b_5logX_5+ b_6logX_{6+} b_7logX_{7+} e \ldots\ldots (10)$$

Where;

Y = groundnut output (kg/ha); X_1= gender (male=1, female=0); X_2 = Farm experience (years); X_3= farm size (ha); X_4= Labour input (man-days); X_5= seed (kg); X_6= Fertilizer (kg); X_7= Herbicides (litre); b_0 = Constant term; $b_1 – b_7$ = Regression coefficient to be estimated; e = Error term

Returns to Scale: Is the change in output as a result of a given proportionate change in all the factors of production simultaneously. It is a long run concept as all the variables are varied in quantity. Returns to scale are increasing or constant or decreasing depending on whether proportionate simultaneous increase of input factor's results in an increase in output by a greater or same or small proportion. Elasticity of production is used to estimate returns to scale generally it given as;

Elasticity of production (E_p) = % change in output (%ΔY) / % change in input (%ΔX)….. (11)

It can also be estimated in terms of the relationship between Marginal Physical Product (MPP) and Average Physical Product (APP) as given below;

$E_p = [\Delta Y/Y] / [\Delta X/X]$….. (12)

Written as;

$E_p = [\Delta Y/ \Delta X] / [X / Y]$….. (13)

Given that;

$\Delta Y/ \Delta X$ = MPP; and X / Y = 1/ APP….. (14)

Therefore;

E_p = MPP / APP….. (15)

However, in production function the return to scale is obtained by the summation of elasticity coefficients of the independent variables [XV].

$\sum Ep_k$ =RTS….. (16)

Where; $\sum$=Summation sign; Ep_k= Elasticity coefficient of k variable; RTS = Returns to scale

If $\sum Ep_k > 1$ it is increasing returns to scale

If $\sum Ep_k = 1$ it is constant returns to scale

If $\sum Ep_k < 1$ it is decreasing returns to scale.

III. RESULTS AND DISCUSSION

Socioeconomic characteristics of the respondents

The socio economic characteristic of groundnut farmers in the study area as shown in Table I indicates that Most (91.25%) of the farmers involved in groundnut production are male. The results suggest that more males participated in groundnut farming than the females in the study area. The low proportion of female farmers could be as a result of the fact that most women are engaged in trading and do not own farmland due to tradition. The results agree with [XVI] who concluded that farming is a male dominated profession and females are however more involved in either trading or processing of agricultural products than their male counterparts. Gender is an essential socioeconomic factor that can affects the roles played in agricultural production and access to productive inputs. The respondents have a mean farming experience of 14 years; implying that the respondents had adequate experience necessary for increased production. The good use of experience comes in the form of management, planning and decision making in the farm operations and activities. It is also very important in terms of coordinating farm activities. This shows that the managerial ability of farmers can be inferred to be reasonably good. The more experienced a farmer is the more efficient his decision making processes and more he will be willing to take risks associated with adoption of innovation to increase his production. Farming experience is the act of gaining knowledge through constant practicing of skill, which brings about specialization. Experience enhances more efficient use of scarce resources by arable crop farmers. This

result corroborates with the findings of [IX]; [V] who also reported similar results. The mean farm size of the respondents was 1.1ha, implying that they are small scale farmers producing at subsistent level. The small farm size is as a result of land tenure system or ownership which is characterized by fragmentation of farmlands. This result agrees with [XVI] who reported that agricultural production is still highly dominated by the small scale farmers. The average yield recorded by the farmers was 580kg ha-1, which is very low as compared to global average yields estimated at 2000Kg ha-1, potential yields of 3000 kg ha-1 is also attainable [XII]. An average of 102 man-days of labour was employed by the respondents on their groundnut farms; implying high labour requirements for farm activities which will result in increasing the rate of farm productivity and labour costs. This result corroborates with the findings of [IX]; [V] who also reported similar results. Most (85%) of the farmers do not use improved seeds. The cost of improved seeds and lack of awareness on the benefit of improved seeds may be responsible for the use of groundnut grains and local varieties as planting materials. The farmers used 2-3 seeds per stand to ensure germination since most of the seed are locally sourced. The germination percentage is usually low so they need more seeds per stand to ensure germination. This increases the cost of seeds and reduces profitability. This result corroborates with the findings of [IX] who reported similar results. The mean quantity of organic fertilizer applied on their farms is 900kg. Organic (poultry) manure is more available in the study area as compared to inorganic fertilizer because of poor access, high cost and lack of technical knowledge on fertilizer requirements of groundnut. However, the Organic (poultry) manure is used without any scientific recommendation [XVII].The mean quantity of agrochemicals used by farmers was 6 liters of pesticides per hectare which is not adequate. An average of 15 liters of pesticide is required per hectare for groundnut production [XVII]. The farmers rarely used herbicides on their farms. This implies that the farmers use hoe weeding, animal traction and heavy machines in weed control. This may not be sustainable because of the cost and lack of labor supply particularly at the peak of the season. According to [XVII] manual weeding is expensive, labour intensive and the availability of labour is often not reliable particularly at the peak of the season and may not be effective in reducing yield loss because hand weeding may damage pegs and roots and reduce crop yield.

Profitability (costs and return) analysis

Table II revealed that the gross output per hectare was 580kg.The costs and return analysis reveals that total production cost of groundnut per hectare in the study area was estimated as ₦62,850, while the estimated total revenue was ₦110, 200 ha-1. The estimate of net farm income was ₦47,350 ha-1, suggesting that groundnut production in the study area was a relatively profitable venture. From the analysis, the estimates of total variable and fixed costs were ₦50,350 ha-1 and ₦12,500 ha-1 respectively. The major costs incurred in groundnut production were fertilizer (34.2%), labor (30%) and farm improvement (17.5%). Also, Table 2 presented the profitability ratios of groundnut farmers in the study area; operating ratio of 0.46 (46%) translates to the proportion of the gross income expended on the variable costs (operating expenses). Also, fixed ratio of 0.11 indicates the ability of the gross income to cover the total fixed costs. Furthermore, the estimated gross ratio was 0.57, implying that 57% of the Gross Income (GI) was expended as total production cost; a lower ratio of less than one is desirable. The estimated return on investment was 1.75 (ROI>1 is desirable) (1.75>1), suggesting that for every ₦1 naira invested in groundnut production the farmer should earn ₦0.75. This result is in conformity with the works of [IX], [VIII] and [XVIII], who also reported that groundnut production was a profitable enterprise.

Regression Analysis

The regression (double log function) analysis presented in Table III was used to determine the input and output relationship in groundnut production. The result of the regression model fitted to analyze the determinants of productivity reveals that the coefficient of multiple determinations (R^2) was 0.763 implying that 76% of the variation in the output of groundnut was accounted for by the variable inputs in the model. The remaining 24% not explained may be due to omitted variables and the stochastic error term. The regression coefficients of experience (0.683), farm size (0.348), labour (0.305) and fertilizer (0.561) were positive and statistically significant at 5% ($p< 0.05$) level, this implies an increase in these positive variables, holding other factors constant will lead to an increase in gross output, any 1% increase in these inputs would increase groundnut output by 0.68%, 0.34%, .30% and 0.56% respectively. This conforms to the findings of [IX], [V] and [XIX]. The coefficients of seed (-0.322) and herbicides (-0.217) were negative but statistically significant at 10% ($p< 0.1$) level, this negative coefficients suggests an inverse relationship with gross (groundnut) output, this results conforms to the findings of [XVI]. The F-ratio (F 5.824) is significant at 5% ($P < 0.05$) level, implying that the regression model significantly predicts the outcome variable. The variables significantly explained the variations in the gross (groundnut) output. Therefore the regression model is good fit for the data, suggesting a linear relationship among the variables.

Elasticity of production

Table IV revealed that the estimated value of elasticity of production ($\sum Ep_k$) is 0.675 ($Ep<1$), which suggests decreasing returns to scale i.e. increase in the use of variable resources yields less additional output (decreasing returns). It represents stage II of production function. The technical efficiency of variable factors decline but, the technical efficiency of fixed factors increases as indicated by increasing total physical product (output).

Constraints of Groundnut Production

The result of Table V revealed the constraints associated with groundnut production. The following production constraints were identified as opined by the respondents; inadequate capital (86.25%), high cost of production inputs (82.5%), poor access to improved production technology (77.5%), lack of access to agricultural credit (61.25%), fragmented farmlands (55%), post-harvest losses due to poor storage facilities (46.25%), pest and diseases (42.5%) and lack of extension contact(36.25%). All the constraints identified significantly affected groundnut production in the study area.

IV. CONCLUSION

This study analyzed the economics of groundnut production in Dambatta LGA of Kano state, Nigeria. The results of the study revealed that the socioeconomic factors of the respondents significantly affected groundnut production in the study area. The costs, return and profitability ratio analysis indicated that groundnut production in the area was a relatively profitable venture. The variables in the regression model significantly explained the variations in the gross (groundnut) output. Therefore the regression model is good fit for the data, suggesting a linear relationship among the variables. The estimate of elasticity of production indicated decreasing returns to scale. Furthermore, all the constraints identified significantly affected groundnut production in the study area. All the constraints identified were economically important in groundnut production. Therefore, effort should be channeled towards ameliorating these constraints. All stakeholders are encouraged to play their part in ensuring sustainability and increased productivity of the crop in the study area. This study therefore recommends the following;

i. Cooperative formation should be encouraged among farmers to enable them pool resources together for cost effective input acquisition, enhanced productivity and effective marketing of their produce.
ii. Formulation of policies to ensure improved access to subsidized production inputs, agricultural technology, credit and extension services.
iii. Robust investment strategies, policies and programmer should be initiated, that will ensure sustainable groundnut production and profit maximization.
iv. Efforts should be made to strengthen extension service delivery of improved technology and management practices to the farmers.
v. Improved land tenure policies and practices should be formulated and adopted to reduce incidence of agricultural land fragmentation. To this end the land use act should be appropriately amended.
vi. Improved access to research and development that will proffer solutions for effective pest and disease control, processing and storage of the product as well as organizing out growers to serve as source of certified seeds for multiplication and dissemination to farmers.

ACKNOWLEDGEMENT

The first author designed the study, performed the statistical analysis, and wrote the protocol and the first draft of the manuscript. The first and second authors managed the analyses of the study. The second and third authors managed the literature searches. All authors read and approved the final manuscript.

REFERENCES

[1] National Peanut Council (2006). *Peanut industry guide 2000-2001 the peanut farmer*, 26(8): 270
[2] Mukhtar, A.A. (2009). Performance of three groundnuts (*Arachis hypogaea L.*) varieties as affected by basin size and plant population at Kadawa. *Ph.D. Dissertation Submitted to post graduate school, Ahmadu Bello University, Zaria* pp 173.
[3] Food and Agriculture Organization (FAO) (2006). *Production year book*, Rome, Italy.2006; 60.
[4] Weiss EA. 2000. *Oilseed crops*. London. Blackwell Science.
[5] Alabi, O. F., Owonibi, B., Olafemi, S.O, & Olagunju S. (2013). Production analysis of groundnut in Birni Gwari Local Government Area of Kaduna State, Nigeria. *PAT. 2013: 9(2):102–113. Available: Patnsukjournal.net/*
[6] National Bureau of Statistics (NBS) (2007). *The Nigerian Statistical Fact Sheets on Economic and Social Development.* Abuja: National Bureau of Statistics, 121pp.
[7] Hamidu, B.M., Kuli, S.G., & Mohammed, I. (2006). Profitability analysis of groundnut (*Arachishypogae L.*) processing among women entrepreneurs in Bauchi metropolis. *A paper presented at 20th Annual National Conference of Farm Management.*
[8] Taru, Y.B., Kyagya, I.Z., & Mshelia, S.I. (2010). Profitability of groundnut production in Michika Local Government Area of Adamawa State. *Nigerian Journal of Agricultural Science*. 2010; 1:25-29.
[9] Girei, A.A., Dauna, Y. & Dire, B. (2013). And Economic Analysis of Groundnut (*Arachis hypogea*) production in Hong Local Government Area of Adamawa State, *Nigeria Journal of Agriculture and crop Research* 1 (6) pp.84 – 89.
[10] National Agricultural Extension Research and Liaisons Service (NAERLS) (2011). *Agricultural survey for 2011 wet seasons*.
[11] Garba, A.B., Anwalu, M. & Abdul, S.D. (2002). Effect of variety and intra-row spacing in Groundnut production under the prevailing weather condition of the Northern Guinea, *Nigerian Journal of Agricultural Technology*. pp. 2 (7) 54 – 59.
[12] Food and Agriculture Organization (FAO) (2011). *FAO report-FAOSTAT Production Year Book*; 2011.
[13] Raw Material Research and Development Council (RMRDC) (2004). *Report on Survey of Selected Agricultural Raw Materials in Nigeria, Maiden Edition*.
[14] Audu, S. I., Girei, A.A., Onuk, E. G., & Onyenye, P. O. (2017). Productivity and Profitability of Groundnut Production (*Arachis hypogea* L.) in Lafia Local Government Area, Nasarawa State, Nigeria. *Asian Research Journal of Agriculture 4(3): 1-11, 2017.*
[15] Reddy, S., Ram,P.R., Sastry, T.V., Devi, I.B., 2004. *Agricultural Economics.* Pg.201. Oxford & IBH publishing Co.Pvt.
[16] Madaki, M. J., Abba, I. Y. & Mary, A. (2016). Economic analysis of groundnut production in Biu Local Government area of Borno state, Nigeria *International Journal of Information* Research *and Review, Vol. 03, Issue, 01, pp. 1657-1660 January, 2016.*
[17] Ibrahim, U., Ayinde, B. T.,Dauda, H., Mukhtar, A.A., (2012). Socio-economic factors affecting Groundnut production in sabon-gari local government of Kaduna state, *Nigeria. International Journal of Food and Agricultural Economics*. Vol. 1No.1 pp.41-48 41
[18] Ani, D.P., Umeh, J. C & Weye, E.A. (2013). Profitability and economic efficiency of groundnut production in Benue state,

Nigeria. *African journals of food, Agriculture, Nutrition and Development 13(4) 8091- 8105*.Association of Nigeria held at Forestry Research Institute of Nigeria, Federal College of Forestry Jos, Plateau State; 2006.

[19] Awoke, M. U. (2003). Production analysis of groundnut in Ezeagu Local Government Area of Enugu State, Nigeria. *Global Journal of Agricultural Sciences*. 2003; 2(2):138–142.

TABLES

Table I: Summary Statistics of the Socioeconomic Characteristics of the Respondents

CONSTRAINTS	MEAN	FREQUENCY	PERCENTAGE (%)
Gender (male)		73	91.25
Farming experience (years)	14		
Farm size (ha)	1.1		
Labour (man-days)	102		
Seed variety (local)		68	85
Fertilizer(organic) (kg)	900		
Agrochemical (pesticide)(liters)	6		

Source: Field Survey (2017)

Table II: Costs and Return Analysis for Groundnut Production (₦ Ha-^{1})

VARIABLES	AMOUNT (₦/HA)	PERCENTAGE (%)
(A) Returns: Gross output 580 ha-^{1} Price/kg ₦190 *Total Revenue (TR)*	*110,200*	
(B) Variable cost (VC):		
(i) Labour	18,700	30
(ii) Seed	3,850	6.1
(iii) Agro-chemicals	6,200	9.9
(iv) Fertilizer	21,600	34.2
Total Variable cost (TVC)	*50,350*	
(C) Fixed cost (FC):		
(vi) Depreciation cost of farm assets (vii) Farm improvement	1,500 11,000	2.3 17.5
Total fixed cost(TFC)	*12,500*	
Total cost (TC)	*62,850*	*100*
(D) Net farm income (NFI) *(E) Profitability ratios:*	47,350	
(ii) Operating ratio (TVC/TR) (iii) Fixed ratio(TFC/TR) (iv) Gross ratio (TC/TR) (v)Return on investment (ROI) (TR/TC)	0.46 0.11 0.57 1.75	

Source: Field Survey (2017)

Table III: Regression Analysis

VARIABLE	COEFFICIENT	STANDARD ERROR	T-RATIO
Constant	3.212**	1.369	2.346
Gender(X_1)	$0.034^{n.s}$	0.121	0.281
Experience(X_2)	0.683**	0.259	2.637
Farm size(X_3)	0.348**	0.130	2.677
Labour(X_4)	0.305**	0.114	2.675
Seed(X_5)	-0.322*	0.177	-1.819
Fertilizer(X_6)	0.561**	0.252	2.226
Herbicides(X_7)	-0.217*		
R^2	0.763	0.132	-1.644
F Ratio	5.824**		

SOURCE: FIELD SURVEY (2017); **= SIGNIFICANT at (P<0.05), * = SIGNIFICANT at (P<0.1) and $^{N.S}$= NOT SIGNIFICANT

Table IV: Elasticity of Productive Resource and Returns to Scale

VARIABLE INPUTS	ELASTICITY OF PRODUCTION (Ep)
Farm size	0.348
Labour	0.305
Seed	-0.322
Fertilizer	0.561
Herbicides	-0.217
Return to scale	0.675

SOURCE: FIELD SURVEY (2017)

Table V: Constraints of Groundnut Production

Constraints	Frequency*	Percentage (%)
Inadequate capital	69	86.25
High cost of production inputs	66	82.5
Lack of extension contact	29	36.25
Fragmented farmlands	44	55
Post-harvest losses due to poor storage facilities	37	46.25
Poor access to improved production technology	62	77.5
Pest and diseases	32	42.5
Lack of access to agricultural credit	49	61.25
* = Multiple response		

SOURCE: FIELD SURVEY (2017)