

SOLE GROUNDNUT PRODUCTION AMONG WOMEN FARMERS' IN MAYO-BELWA
LOCAL GOVERNMENT, ADAMAWA STATE, NIGERIA

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ABSTRACT

This study examines sole groundnut production among women farmers in Mayo-Belwa Local Government Area of Adamawa State, Nigeria. The objective was to determine the efficiency of resource use in groundnut production among women farmers. Primary data were collected and used from a random sample of 120 groundnut women farmers selected in six of the twelve wards of the Local Government Area. Descriptive statistics, multiple regression analysis, marginal analysis of input utilization and gross margin analysis were employed. The result revealed that majority of the groundnut women farmers were married and literate. The average age was 39 years with farming experience of 19 years. The result further revealed that farm size, quantity of seeds, quantity of inorganic fertilizers and man-days of hired labour were significant at varying levels and positively influenced groundnut output. The variable included in the model account for 56% of the variation in the groundnut yield. The analysis of the resource utilization showed that fertilizer, hired labour and land were under- utilized. The gross margin analysis revealed a gross margin per hectare of ₦43, 987.33. The total variable cost per hectare was estimated as ₦18, 485.17. Groundnut women farmers were faced with the problems of inadequate capital, lack of credit facility, pest and disease, low commodity price and high cost of agro-chemicals. The study recommended the use of improved groundnut seed varieties to increase yield per hectare, among others.

KEY WORDS: Groundnut production, women farmers Mayo-belwa and Nigeria

INTRODUCTION

Groundnut (*Arachis hypogaea L*) is the 6th most important oilseed crop in the world and is also an important food and cash crop across sub Saharan Africa (Tarawali and Quee, 2014). According to Trade Invest Nigeria (2010), Nigeria produces 4.5% of the world total groundnut production following China (41.5%), India (18.2%) and USA (6.8%). In West Africa, Nigeria produces 41% of the total groundnut output (Echekwu and Emeka, 2005). Production in Africa has been estimated at about 4.6 metric tons with Nigeria, Gambia, Senegal, Zaire and Sudan being the largest producers in Africa (Ashley, 1993). Estimate placed Nigeria's production of unshelled nuts at about 2.6 metric tons annually from a land area of approximately 2.5 million hectares. On the average, it has been observed that 80% of the cultivated land area in Nigeria is planted to more than one type of crop (Tererai *et al*, 2017).

Women farmers play significant and crucial roles in agricultural development and allied fields and their roles vary from region to region and from country to country. The role of women in agriculture and economic development started receiving international and national attention only in the late 1960's and due to their role in livestock production, crop production and marketing (Ani, 2004). Women take part in all the farm operations even in the irksome land clearing and bush burning

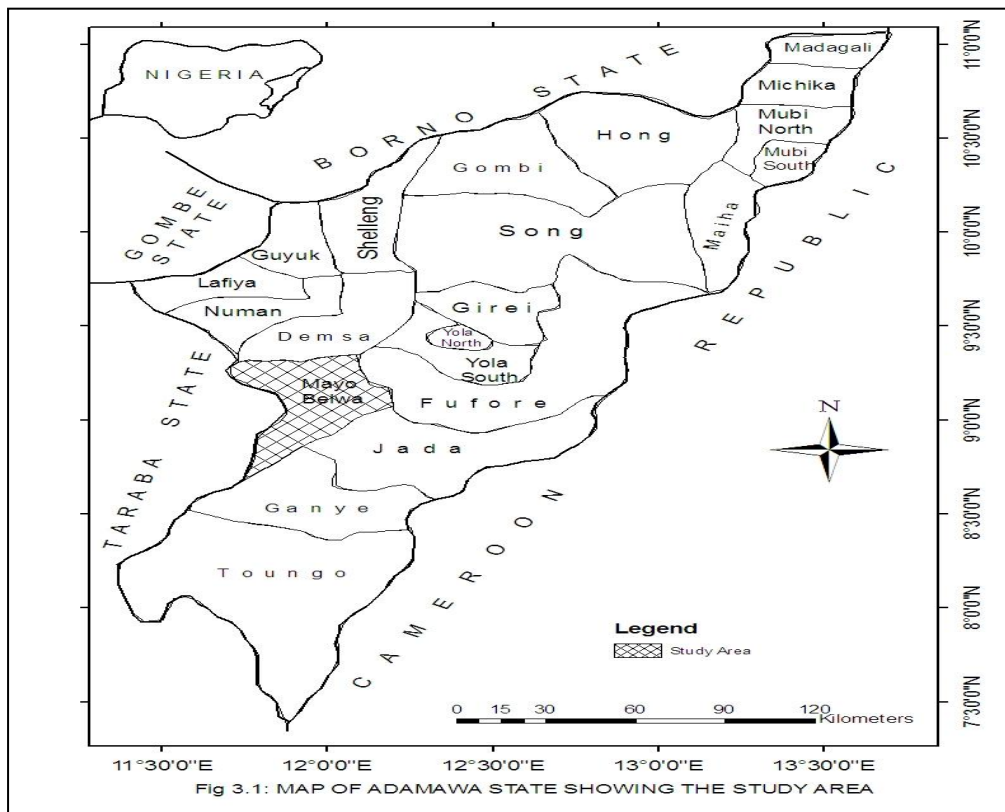
operations. Wallis (1965) studied on the roles of women in agriculture and asserted that women are equal partners to men in all chains of agricultural production, and that agricultural production and in indeed the living standard of a nation cannot be improved unless women are actively involved.

In Asia, women accounted for approximately 50% of food production in the region, with considerable variation from country to country. For example, women make up 47% of the agricultural labour force in the Philippines, 35% in Malaysia, 54% in Indonesia and over 60% in Thailand. In Southeast Asia, women play a major role in rice and groundnut production, particularly in sowing, transplanting, harvesting and processing (Agada, 2012).

According to Idama, 2007 over 330 products can be commercially produced from groundnut and jobs can be directly created from enhanced groundnut production with small improvement in the technology and the use of improved variety with corresponding increase of cultivated acreage. As a legume crop, groundnut adds nitrogen to the soil by increasing soil fertility. In recent times, there has been increased awareness in the cultivation of food legumes like groundnut, not only as food but as soil fertilizer. This reduces the farmers' demand for inorganic fertilizer.

METHODOLOGY

Mayo-Belwa Local Government Area is one of the twenty one local Government Areas in Adamawa State. It is located in the Southern Senatorial district of Adamawa State. It lies between latitude $9^{\circ} 3'$ North and longitude $12^{\circ} 3'$ East and covers a land area of $1,831.79\text{km}^2$ (Adebayo, 1999) with a total population of 176,658 (NPC, 2006). Mayo-Belwa shares common boundary with Yola-South and Fufore Local Government Area in the South East, Demsa Local Government in the North -East, while to the North-West are Zing and Lau Local Government Areas of Taraba State. Furthermore, in the East, it shares boundary with Jada, Ganye, Gembu and Tongo Local Government Areas.



Sampling Techniques and Sampling Size

Multi– stage random sampling technique was used to select the respondents for the study. In the first stage, six out of the twelve wards in Mayo – Belwa Local Government Area were randomly selected so as to ensure wider coverage. In the second stage, two villages were randomly selected from each ward making a total of twelve villages. From the selected villages, a total of one hundred and twenty (120) women groundnut farmers were selected in proportion to the size of the women.

Model specification

Data obtained from this study were subjected to different types of analysis.

The gross margin analysis was used to determine the cost and returns associated with groundnut production among women farmers in the study area. Gross Margin (GM) is the difference between the Gross Farm Income (GFI) and Total Variable Cost (TVC) (Olukosi and Erhabor, 1998). The implicit form of the model is expressed as:

$$GM = GFI - TVC = P_{yi} Y_i - P_{xi} X_i \dots\dots\dots 1$$

Where:

GM = Gross Margin

GFI = Gross Farm Income

TVC = Total Variable Cost

P_{yi} = Unit price of product Y and of the i^{th} respondent

Y_i = Gross output (kg) of the i^{th} respondent per hectare

P_{xi} = Price per unit of the variable input X of the i^{th} respondent

X_i = Quantity of variable input X (where $J = 1, 2 \dots M$) to be used by the i^{th} respondent per hectare.

Multiple Regression Model

Multiple regression analysis was used to examine the influence of various variable inputs on the output of groundnut produced as well as the marginal analysis of the efficiency of input used by groundnut women farmers in the study area.

Four functional forms were tried, these include; linear, exponential, double log and semi-log functions to determine the one with the best fit. The explicit formula for the model is stated below.

Linear function

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots\dots + b_8 X_8 + U_i \dots\dots\dots 2$$

Exponential function

$$\ln Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots\dots + b_8 X_8 + U_i \dots\dots\dots 3$$

Double log (Cobb-Douglas) function

$$\ln Y = b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + \dots\dots b_8 \ln X_8 + U_i \dots\dots\dots 4$$

Semi – logarithms function

$$Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + \dots + b_8 \ln X_8 + U_i \dots\dots\dots 5$$

Where:

Y = Output of groundnut (in kg)

X_1 = Age of farmers (in years)

X_2 = Household size

X_3 = Farm size (in hectares)

X_4 = Farming experience (in years)

X_5 = Quantity of inorganic fertilizers (in kg)

X_6 = Hired labour (in mandays)

X_7 = Family labour (in mandays)

X_8 = Quantity of seed planted (in kg)

b_0 = constant

$b_1 - b_8$ = Coefficient of independent variables to be estimated

U_i = Error term.

Marginal Analysis of Resource Utilization

Regression coefficients (b_1 - b_8) from the regression analysis were used to compute the Marginal Value Product (MVP) for each input used. The computation of the MVP and the Marginal Factor Cost (MFC) are as follows:

$$\text{MVP} = \text{MPP}_x P_y \dots\dots\dots 6$$

$$\text{MFC} = P X_i \dots\dots\dots 7$$

Where:

P_y = Unit price of 100kg bag of groundnut

MPP = Marginal Physical Product (i.e dy/dx_i) was estimated based on the selected functional form (i.e, product of regression coefficient and the mean output).

MFC = Unit cost of that particular input.

The ratio of the MVP to MFC was used to determine the efficiency with which resources were used.

That is

$$R = \text{MVP}/\text{MFC} \dots\dots\dots 8$$

Where:

R = efficiency parameter and if

$r = 1$ means resource is efficiently used

$r < 1$ means resource is over used

$r > 1$ means resource is under used

The MVP for each input used was computed using the regression coefficients of each input. The MFC is the prevailing market price of each input or geometric mean value of the input (x). Kay (1981) opined that a firm maximized its profit with respect to an input if the ratio of its MVP to its MFC is unity.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Respondents

The socio-economic characteristics of the respondent discussed include: age, marital status, educational level, household size, land acquisition, farm size, farming experience, and sources of finance, major occupation, sources of labour, cooperative membership, extension contact and access to credit.

The distribution of the respondents by age is presented in Table 1. The result reveals that 6.67% of the respondents were within the age of 15-24 years, majority (87.50%) falls within ages 25 and 54 years. Only about 6% are more than 55 years and above. The mean age of the respondents is 39 years. This result has revealed that majority of the women farmers in the study area have fallen within the most active age of the population. This shows that they are strong and energetic; hence their strength can be effectively utilized to boost groundnut production in the study area. The result in Table 1 shows the distribution of the respondents by level of education. The result reveals that a high percentage (29.17%) of the respondent had no formal education, while the rest (about 71%) had one level of education or the other. The study has revealed that majority (70.83%) of women farmers in the study area are literate. This implies that adoption of agricultural production technologies that could be easier and faster among the respondents and this corroborates with the findings by Gbegeh and Akubilo (2013) who reported that the more the level of education of a farmer, the more likely for a farmer to adopt yield increasing technologies.

The implication is that most of the respondents are within the economically active age. This finding corroborates the finding of Stephen et al., (2010) and Bathon (2013) which says that given the right set of inputs, the respondents have the potential of producing large amount of groundnut output. The distribution of the respondents by marital status as presented in Table 1 shows that majority (about

81%) are married. The single constitute only about 9%. This study indicates that married women were mostly involved in groundnut production in the study area. The implication is that besides their role in household, women still form the backbone of agricultural labour force. For example, an estimated 40% of the Gross Domestic Product (GDP) and over 50% of the developing nations' food are produced by women (African Farmer, 1994).

About 27.50% of the respondents have household size of 1-5 family members, while the majority (68%) has household size of between 6 and 15. Only 4.17% have 16 family members and above. The mean household size is 8 persons. This finding reveals that majority of the respondents have relatively large household size and this has implication on the supply of family labour for farm operations. Generally, in agrarian settlements, large family size guarantees free and cheap labour and also an incentive to produce more output (Paudel and Matsuoka, 2008; Ojo *et al.*, 2008).

The distribution of the respondents by farm size shows that 38.33% of the respondents cultivate less than 2 hectares and 60.00% of the respondents cultivate between 2-4.0 ha, while only 1.67% of the respondents cultivate 4.1 hectares and above. The mean farm size is about 2 hectares. The result reveals that majority of the respondents are small scale farmers and is usually the characteristics feature of the traditional agriculture where farm holdings are fragmented due largely to land tenure system.

The distribution of the respondents by farming experience as shown in Table 1 indicates that 19.17% of the respondents have been farming groundnut for between 6-10 years, while majority (68.33%) have been farming groundnut for more than 10 years. Only 12.50% of the respondents have farming experience of 1-5 years. The mean years of groundnut farming experience is about 19 years. The implication is that women groundnut farmers in the study area are well experienced in groundnut production and this would ultimately improve their production skills and marketing decisions.

The distribution of the respondents by source of finance reveals that majority (85%) of the respondents' utilized personal savings in their groundnut production, while only 1.67% used loans obtained from banks. Also, 5.83% of the respondents obtained loans from cooperative societies, while 7.50% used money obtained from others. Since most of the respondents used personal savings as their source of income, they may not be able to expand their production in view of their income source. The finding concurs with the findings of Stephen *et al.* (2010); Maurice (2012), who reported that the use of personal saving in agricultural production restrict farmers to small scale production and affect their capacity to increase production.

The distribution of respondents by source of labour reveals that family labour constitutes the bulk of labour used (48.33%) and could be attributed to their subsistence level of production. Also, 30% used both hired and family labour, while 12.5% used hired labour only and only 9.17% used labour supplied from group contribution. This implies that majority of the groundnut women farmers used family labour. Credit accessibility of the respondents shows that 21.67% of the respondents had access to production credit, while the majority (78.33% do not have access to credit at all. This finding shows that most of the women farmers that engaged in groundnut production in the study area do not have access to credit to finance agricultural production and this may be the reason for their small farm holdings. According to Gbegeh and Akubuilu (2013), access to credit increases farmers' ability to purchase inputs and also adopt new production technologies. Farmers who have access to credit can relax their financial constraints and therefore buy inputs. The reverse is the case for the women farmers.

Table 1. Socio-economic characteristics of the Respondents

Variable	Frequency	Percentage %	Mean
Age (years)			
15 – 24	8	6.67	
25 – 34	16	13.33	
35 – 44	57	47.50	39.03
45 – 54	32	26.67	
Level of education			
Noformal education	35	29.17	
Primary education	49	40.83	
Secondary education	30	25.00	
Tertiary education	6	5.00	
Total	120	100	
Household size			
1 – 5	33	27.50	
6 – 10	62	51.66	7.93
11 – 15	20	16.67	
> 16	5	4.17	
Total	120	100	
Farm size (ha)			
< 2	46	38.33	
2 – 3.0	57	49.17	2.18
3.1 – 4.0	13	10.83	
Total	120	100	
Farming experience			
1 – 5	15	12.50	

6 – 10	23	19.17	
11 – 15	16	13.33	
16 – 20	14	11.67	18.70
Total	120	100	

**Source of
finance**

Personal saving	102	85.00
Loan from bank	2	1.67

**Major
occupation**

Farming	59	49.17
Civil servants	2	9.17
Trading	32	26.66
Processing	8	6.67
Others	11	1.67
Total	120	100

**Source of
labour**

Hired labour	15	12.50
Family labour	58	48.33
Hired & family labour	36	30.00

**Credit
Accessibility**

Yes	19	15.83
No	101	84.17
Total	120	100

Source: Field Survey, 2013

Profitability Analysis

The gross margin per hectare from groundnut production among women farmers in the study area was estimated to be ₦43, 987.33 as presented in Table 2. The total variable cost (TVC) per hectare was ₦18, 485.17, while the fixed cost was assumed to be negligible. Of the total variable cost per hectare, cost of hired labour, cost of seed and cost of herbicides constituted 39.72%, 28.22% and 17.45% respectively, which is about (85%) of the total variable cost. The total revenue per hectare was estimated at ₦62, 472.50. The positive gross margin is an indication that groundnut production among women farmers is a profitable venture. This is made possible as a result of the availability of an assured market outlet brought about by the increasing demand for the commodity.

Table 2: Cost and returns per hectare of groundnut production among women farmers.

Items	Values (₹)	% of total variable cost
Seed	5,215.79	28.22
Herbicides	3,224.90	17.45
Seed dressing chemicals	113.60	0.61
Empty bags	1,123.56	6.08
Transportation	761.65	4.12
Hired labour	7,342.44	39.72
Fertilizer	703.23	3.80
Total variable cost/ha	18485.17	100
Returns		
Total revenue/ha	62,472.50	
Gross Margin (TR – TVC)/	43,987.33	

Source: Field Survey, 2013

Regression Analysis

The result of the multiple regression analysis reveals that double logarithm function gave the best fit based on economic, and statistical criteria, hence was chosen as the lead equation. The model is stated as:

$$\begin{aligned} \ln Y = & 3.238 + 0.273 \ln X_1 + 0.060 \ln X_2 + 0.420 \ln X_3 + 0.080 \ln X_4 + 0.016 \ln X_5 + 0.013 \ln X_6 + \\ & (17.647)^* \quad (-2.274)^{**} \quad (1.209) \quad (6.983)^* \quad (2.929)^* \quad (2.161)^{**} \quad (2.344)^{**} \\ & + 0.008 \ln X_7 + 0.054 \ln X_8 \\ & (0.692) \quad (0.825) \end{aligned}$$

Figures in parentheses are the corresponding t values

* Significant at 1%; ** Significant at 5%

R^2 (Coefficient of determination) = 0.560

Adjusted R^2 = 0.528

F-ratio = 17.643*

The result shows that the coefficient of explanatory variables; age, household size, farming experience, quantity of inorganic fertilizers and hired labour were statistically significant at varying levels. However, coefficient of farm size, family labour and quantity of seed planted were not statistically significant.

The coefficient of multiple determinations (R^2) reveals that 56% of the variation in groundnut production among the women is accounted for by the variables included in the model. The overall model is also significant at 1% level showing that the model was a good fit.

From the result of the regression analysis, the coefficient of age (X_1) is positive and statistically significant at 1% level implying as women farmers advances in age groundnut output increases. Since double logarithm function was chosen as the lead equation and the coefficients are direct elasticities.

The coefficient of household size is statistically significant at 5% level and positively related to groundnut output of women farmers, implying that increase in household size increases groundnut output. A 1% increase in household size will bring about 0.06% increase in groundnut yield. Supply of family labour is more with higher household size, and this reduces the cost of paid labour.

Farm size has a positive coefficient and statistical significant at 1% level implying that increase in farm size of women farmers would bring about increase in output of groundnut. In this regard, a 1% increase in farm size of women farmers would increase output of groundnut by 0.42%.

The coefficient of farming experience is also positive and statistically significant at 1% implying that groundnut output increases with farming experience. In this regard, a 1% increase in farming experience would bring about 0.08% increase in groundnut output. Women farmers with many years of experience in farming tend to be more efficient in groundnut production than those with less experience due to enhanced production skills and knowledge which it brings along, and this corroborates the finding of Fassasi (2007) who stated that efficiency increases through learning by doing.

Inorganic fertilizer has a positive coefficient and statistically significant at 5% level implying that groundnut output increases with increase in quantity of inorganic fertilizers applied. In this regard, a 1% increase in the quantity of inorganic fertilizer used by women farmers would increase output of groundnut by 0.016%. Many women farmers in the study area rarely use inorganic fertilizers in groundnut farming possibly due to high cost of the commodity. Fertilizer application increases fertility of the soil and increases yield of crops.

The coefficient of hired labour is also positive and statistically significant at 5% level, implying that groundnut output increases with more mandays of hired labour. In this regard, a 1% increase in mandays of hired labour used by women farmers in groundnut production would increase output of groundnut by 0.013%.

The returns to scale (i.e summation of elasticities) are 0.378 (inelastic), indicating that groundnut women farmers in the study area are operating in stage II of the production surface. This implies that if all inputs are increased by 1%, output will increase by 0.38%. This stage is the rational stage of production and necessary adjustments in the variable inputs used especially significant ones would result in optimal groundnut yield which leads to profit maximization.

Marginal Productivity of Resource use in Groundnut Production

The marginal physical product (MPP) for input utilization was derived from the estimated regression coefficients and the arithmetic mean values of output and inputs as shown in Table 4.15. The marginal physical product for each of the resources was obtained based on the Cobb – Douglas production function. Farm size (hectares) gave the highest value of marginal physical product (295.97). This implies that increase in farm size by one hectare would result in extra 295.95kg of groundnut.

The efficiency of marginal value products to marginal factor costs were computed for inputs that significantly affected groundnut production. The results revealed that the efficiency of the marginal value products (MVPs) of farm size, hired labour and fertilizer to their corresponding marginal factor costs (MFC) shows that the ratio was greater than unity for these input, indicating that the inputs were under- utilized. Optimal resource allocation requires that the marginal value product (MVP) be equal to marginal factor cost (MFC) or the unit price of the input.

Table 3: Estimated marginal physical product and resource use efficiency.

Variables	MPP	MVP	MFC	MVP/MF C	Resource efficiency
Farm size (X ₃)	295.97	36,996.25	8750.00	4.23	Under-utilized
Inorganic fertilizer (X ₅)	0.37	4625	1139.70	4.05	Under-utilized
Hired labour (X ₆)	0.33	4125	267.39	15.43	Under-utilized

Source: Field Survey, 2013.

Problems of groundnut production among women farmers

The distribution of the respondents by problems faced in groundnut production reveals myriad of problems as shown in Table 4. The problems according to severity include: inadequate capital (22.42%), lack of credit facility (19.56%), pest and diseases (14.06%), low commodity price (12.53%) and high cost of agro-chemicals (11.87%) where they are ranked first, second, third, fourth and fifth respectively. Some of the identified problems above agreed with the findings of Dauna (2011) and Bathon (2013). These problems reduces yield of groundnut and also affect the productivity of women farmers.

Table 4: Distribution of the respondents by problems faced in groundnut production

Production problem	Frequency	Percentage (%)	Rank
Inadequate capital	102	22.42	1
Low commodity price	57	12.53	4
Lack of credit facility	89	19.56	2
Pests and diseases	64	14.06	3
High cost of fertilizer	22	4.84	8
High cost of agro-chemicals	54	11.87	5
High labour cost	40	8.79	6
Drudgery and fatigue	27	5.93	7
Total	455*	100	

Source: Field Survey, 2013

CONCLUSION

The following major conclusions are drawn based on the finding. Majority of the women into groundnut farming are in their active age. Also, most of the women used family labour in comparison to hired labour. The analysis of efficiency ratio showed that hired labour, fertilizer and land were under- utilized.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations are made:

- i. To improve the efficiency of groundnut producers, labour used should be increased because it was underutilized.

- ii. Women have entitlement to small area of farmlands as shown in the cultivated areas. Laws should be promulgated to make land available to women who want to farm on large scale.

REFERENCES

- 1) Adebayo, A.A. (1999). Climate I and II. Adebayo, A.A. and Tukur, A.L (eds.), *Adamawa State in Map*. Department of Geography, Federal University of Technology, Yola. Paraclete publishers, Yola. 20-26

- 2) African farmer (1994): given women a place at the policy table, *The Hunger project*, New York, April Quarterly Publication, p.13

- 3) Agada, M.O. (2012) Resource use Efficiency in Sorghum Production among women farmers in Girei Local Government Area of Adamawa State, Nigeria. B. Tech.

- 4) Ani, A.O (2004). *Women in Agriculture and Rural Development*, Priscaquila publishers Maiduguri, Borno State, Nigeria. 185pp.

- 5) Ashley, J. (1993). *Drought and Crop Adaptation, in Dry Land Farming in Africa* (Rowland, R.J. ed). Macmillan Education Ltd, London and Basing Stoke.

- 6) Bathon, H.A. (2013). Economic Analysis of Groundnut Based cropping system among women farmers in Hong Local Government Area of Adamawa State, Nigeria. M. Sc. thesis (unpublished); Department of Agricultural Economics and Extension, Modibbo Adama University of Technology, Yola

- 7) Beghin, J. Diop, N; Mathey, H. and Sewadah, M. (2003). "The impact of groundnut Trade Liberalization: Implication for the Doha Round" Mimeo, selected paper presented at the 2003 AAE Annual meetings, Montreal.

- 8) Dauna, Y (2011). Economic Analysis of groundnut production in Hong Local Government Area of Adamawa State, Nigeria. M.Sc Thesis (unpublished) Department of Agric. Economics, Modibbo Adama University of Technology, Yola Adamawa State.

- 9) Gbegeh, B.D. and Akubuilu, C.J.C. (2013). Socio economic determinants of adoption of Yam a. Minisett by farmers in Rivers State, Nigeria. *Wudpecker Journal of Agricultural Research*, Vol.2(1), PP.33-38.

- 10) Tererai, K and Emmanuel, M. (2017). An analysis of the profitability of Groundnut Production by small-holder farmers in chegutu District, Zembabwe. *Journal of Economic and Sustainable Development*, vol. 8(8) pp. 167

-
- 11) Maurice, D.C. (2012). Optimal Farm Plan and Resource Allocation in Food Crop Production in Adamawa State, Nigeria. Ph.D Thesis (unpublished). Department of Agric. Economics, Modibbo Adama University of Technology, Yola, Adamawa State.
 - 12) Idama, A. (2007). *Perspectives on Industrialization of Adamawa State*. Paraclete Publishers, Yola. Pp,18-33.
 - 13) Ojo, M.A; Salami, A.E, and Mohammed, U.S. (2008), Profitability, inputs Elasticities and Resources Use Efficiency in Small Scale Cowpea Production in Niger State, Nigeria. *Journal of Agricultural and Social Research (JASR)* Vol.8, No.2, 2008.
 - 14) Paudel, P. and Matsuoka, A. (2008). Factors influencing Adoption of Improved Maize Varieties in Nepal. A case study of Chitwan District. *Australian Journal of Basic and applied Sciences*, Vol.2(4), Pp.823-834
 - 15) Olukosi, J.O and Erhabor P.O. (1998). *Introduction to Farm Management Economics: Principles and Applications*. Agitab Publishers Limited, Zaria
 - 16) Stephen, J. and Girei, M.H. (2010). Profitability of groundnut production in Yola North Local Government Area of Adamawa State, Nigeria. *Global Journal of Agricultural Sciences* Vol.9, 110.2, 2010: 21-25.
 - 17) Trade Investment Nigeria (2010). "Invest in the processing of groundnuts". Investment opportunities in Nigeria. Vol.2(1), PP.33-38.
 - 18) Wallis, H.N (1975): "The role of women in Agricultural change in soarak: 1959-64", in Bunting, (A.H ed) "Changing in Agriculture", University of London.