

Factors Affecting Groundnut Production by Small Scale Farmers in Chibok Local Government Area of Borno State, Nigeria

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Abstract

The major decision towards maintaining high level production of food crops such as groundnuts include the efficiency in the use of resources by small-holder farmers. Hence, this study aimed at analyzing the resource-use efficiency of small-holder groundnut farmers in Chibok L.G.A of Borno State, Nigeria. The data for the research were obtained using simple random sampling technique by administering structured questionnaires. The data collected were analyzed using analytical tools such as simple descriptive statistics and Multiple Regression. The results of the study showed that majority of the farmers (56.0%) were young and within the active ages of between 30 – 49 yrs. Also, most of the farmers were males, educated in one form or the other (66%) and maintaining small plots of farmland of just 1.0ha as well as having moderate household-size of between 6 and 10. The regression results revealed that the factors that affect the output of groundnut production in the area include fertilizer, labour, herbicides, pesticides and farm size. The findings of the research have shown that fertilizer as one of the resources in the groundnut production was over-utilized ($r < 1$); while farm size was under-utilized ($r > 1$). The result identified insecurity (46%) as the major problem facing the farmers in the area. Therefore, it was recommended that the issue of insecurity in the area should be given a top priority by the government. Also, more young people in the area should be encouraged to engage in groundnut farming to efficiently utilize the vast available farmland. Government should make groundnut farming more attractive to them by providing incentives such as input subsidies, modern farm implements etc.

Keywords: Groundnut, Resource-Use, Production, Small-Holder, Utilization, Farm Implements, Subsidy.

Introduction

Groundnut (*Arachis hypogea* L.) is grown in nearly 100 countries in the world. It is the 6th most important crop in the world. It contains 48-50% oil, 26-28% proteins and 11-27% carbohydrates, minerals and vitamin (Mukhtar, 2009). Groundnut is grown on 26.4 million hectares worldwide, with a total production of 37.1 million metrics tons and average productivity of 1.4 metrics tonnes /ha. Developing countries constitute 97% of the global area and 94% of the global production of this crop (FAD, 2011). In Nigeria, the crop is presently grown throughout the country with the exception of the riverine and swamping areas. Groundnut occupies between 1.5 and 2 million ha of land of the country's land (Olurunju, 2000), (Audu et al; 2017). Groundnut is either cultivated sole or in mixtures with

other crops like cowpea, sorghum, and millet. Fifty five percent of the groundnut produced in Nigeria are in mixtures (Anonymous 2004). Despite the availability of abundant land and human resources in Nigeria, yield per hectare from groundnut production has been declining over the years (RMRDC, 2004). Nigeria agriculture is dominated by the small-scale farmers who are low income earners and provide (two-third) of the total food production in the country (Oyekale et al., 2009, Jeffrey et al; 2022). However, one of the major problems of groundnut production is low yield and this is attributed to poor production techniques used by peasant farmers and higher cost of inputs such as cost of improve seed variety, fertilizers, chemicals, and machinery. Inter cropping is also to be considered as other factors contributing to groundnut low yielding. This is as a result of small plant population of groundnut crop and the initial shading impose by other crops like sorghum and millet varieties (Ntare, 2005). The low output realized by smallholder farmer is an indication that resources needed in the production are not at optimal levels (Nweze, 2002; Panwal et al, 2006; Ajibefun et al., 2006; Ahmed et al., 2010). Ntare (2005) stated that small scale farmers' access to crop varieties has long been recognized as a critical step for increasing agricultural use in sub-Sahara Africa. He opines that, adoption of improved varieties that resist pest, disease and drought can often vary in yield even when farmers are unable to adopt more costly inputs such as agrochemicals. Awoke (2003), Babajide Fowowe (2020) identified lack of improved capital input, collateral and high interest rate are some of the major obstacles to groundnut production efficiency. The predominant reliance in traditional method of farming by Nigeria small scale farmers for substantial part of our agricultural production activities has been partly for responsible for present low-level production as against our increasing population (Ohikere, 2010), Mgbenka R. N and Mbah E.N. (2016) Food crops production efficiency is vital to improvement of the agricultural sector use if resource available judiciously used. Many resources are employed by the small-scale farmers at farm level with attendant low output. Since increased used is directly related to production efficiency. It is therefore important to know how resources used by small scale groundnut farmers will be raise in order to help them improve in efficiency. Thus, this study is aimed at examining the resource-use efficiency of small-scale groundnut farmers in Chibok L.G.A Borno State Nigeria.

Methodology

Study Area

The study was carried out in Chibok Local Government Area of Borno State, North-east Nigeria. It is bounded by Damboa local government area in the north-west, in the north and in the north-east, by Askira/Uba local government area in the south. Chibok has a latitude of 10°N and a longitude of 12°E or 10.869205 and 12.847621 respectively. Chibok, Nigeria coordinates are near the Cameroon border; 113 Kilometers W of Koza, Extreme North, Cameroon. Chibok Local Government Area is one of the area councils in Borno state covering the communities, 11 wards and villages of Garu, Likama, Wuntaku, Gatamarwa, Kautikari, Korongilim, Kuburbula, Mbalala, Mboa Kura, Pemi, Shikarkir. Chibok exists as

one among the twenty-seven Local Government Areas of Borno under Bornu emirate in the southern part of the state with its administrative headquarters located in the town of Chibok. This local government has eleven (11) councilors representing the 11 wards of the local government area. Farmers in Chibok Local Government are predominantly involved in growing food crops such as maize, cowpea, groundnut, onion, tomato etc. Some livestock including cattle, goats, and sheep are reared as well.

Sampling Techniques

The Chibok Local Government was purposively selected to carry out research/study with multi-stage random Sampling. Stage 1 involved random sampling of five wards in the Local Government. In stage II, 30 farmers were randomly selected from each of the sampled wards. At the end of the sampling, a sum of 150 respondents were gotten and used for the analysis.

Data Collection

Primary data used for this study were collected using structured questionnaires administered by trained enumerators.

Data Analysis

Data collected were analyzed using simple descriptive statistics such as frequency percentage and means. Also, multiple regression analysis was used to identify factors influencing the output of groundnut production in the area. Resources use efficiency was then determine from the analysis.

The regression model in its general form is specified as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, \dots, U_i) \dots\dots\dots (1)$$

Where;

Y = Quantity of groundnut (kgs)

X₁ = Fertilizer (Kgs), X₂ = Labour (Man-day), X₃ = Herbicides (Liters),

X₄ =Pesticides, X₅ = Farm size, (ha)

U_i = Error term.

The estimated coefficients were used to determine the marginal product (MP) of the variable inputs used in the model. The MP was measured using the formula.

$$\frac{MP}{X_i} = b_i \dots\dots\dots (2)$$

Where;

MP = Marginal Product, b_i = Regression coefficient of resource, X_i = Arithmetic mean of resource X_i

Also, to determine the resource use efficiency, equation is specified as;

$$MVP = MPP (P_y) = b_i P_y$$

MFC = P_x ie Marginal Factor Cost

$$\text{Measure of Resource Use Efficiency (r)} = MVP/MFC$$

IF $r = 1$; resource is efficiently used

$r > 1$; resource under-utilized

$r < 1$; resource over- utilized

Results

Socio-Economic Characteristics of the Respondents

The socio-economic characteristics of the respondents are discussed below.

Table 1: Socio-economic characteristics the farmers

Variables	Frequency	Percentage (%)
Age (Years)		
< 30	51	34.0
30-39	47	31.3
40-49	37	24.7
50-59	14	09.3
60 & Above	01	00.7
Total	150	100.00
Education		
No-Formal Edu.	51	34.0
Primary	03	02.0
Secondary	79	52.7
Tertiary	17	11.3
Total	150	100.00
Household Size		
1 – 5	85	56.7
6 – 10	51	34.0
> 15	14	09.3
Total	150	100.00
Farm Size		
1	98	65.3
2	48	32.0
3 & Above	04	02.7
Total	150	100.0
Extension Services		
NO	150	100.0
YES	0	0.0
Total	150	100
Access to Credit		

NO		150	100.0
YES		0	0.0
Total		166	100.0
Gender			
Female	Male	66	44.0
Total		84	56.0
		150	100.0

Source: Field Survey, 2022.

The results in table 1 showed that 34% of the farmers were below 30 years of age. Moreover, 31.3% and 24.7% were of ages 30 – 39 years and 40 – 49 years respectively. This implied that the majority of the farmers (90%) were within the young and active ages of 49 years and below. This is very significant in view of the labour demand in groundnut farming in rural communities. Furthermore, the findings of the study revealed that most of the farmers (66%) had one form of formal education or the other. Access to formal education plays a vital role in the development of agriculture via exploration of modern technology in farming. Also, the results showed that about 90% of the farmers in the area had moderate household-size of 10 and below. The findings of the research revealed that majority of the farmers (65%) were cultivating just 1.0 ha of farmland. This is a peculiar characteristic of small scale subsistent agricultural production.

Furthermore, the result in table 1 showed that none of the farmers interviewed had access to neither Extension Services nor Credit Facilities. Most of the farmers (56%) in the area as shown in the result, were male. This indicates that those involved in the farming of groundnut were men who could withstand the stress of the various activities in the cultivation.

Factors Affecting the Output of Groundnut in the Study Area

Table 2: Regression result showing the effects of socio-economic characteristics on the groundnut output in the area

Variable	Coefficient	Std. Error	t-Statistic	Prob.	
Fertilizer	0.144905	0.77521	5.349754	0.0000	*
Labour	0.287967	0.077976	3.693039	0.0003	*
Herbicides	0.002804	0.000797	3.518053	0.0005	*
Pesticides	0.011884	0.004255	2.792853	0.0056	*
Farm Size	1.509778	5.606378	3.713377	0.0003	*
Constant	-80.69814	44.07216	-1.831046	0.0683	
R-squared	0.507374				
Sum squared resid.	19147076				
Log likelihood	-1760.510				
F-statistic	41.71249				

Source: Field Survey, 2022.

* Significant at 1%

The result in table 9 showed the effects of socio-economic characteristics on the output of Groundnut in the study area. The R^2 value of 50.74 indicates that the over 50% variation in the output of produced by farmers in the area were accounted for by the variables. The amount of fertilizer used (0.144905) was shown in the result to be statistically significant at 1% and have a positive relationship with the output of the production. Similarly, labour (0.287967) was statistically significant at 1% and positively influenced the output obtained. Also, the quantity of herbicides applied was found to be statistically significant at 1%. The output of groundnut obtained was affected by herbicides applied by the farmers. Furthermore, the result showed that the pesticides used on the farm had positive and significant effects on the output at 1%. Moreover, farm size had a positive effect on the output and it's significant at 1%. The result implies that the output increased with increase in the farm size.

Therefore, the factors that affect the output of groundnut according to the result include fertilizer, labour, herbicides, pesticides and farm size.

Measure of Resource-Use Efficiency

Measure of Resource Use Efficiency

$$r = MVP/MFC$$

MVP is Marginal value Product

MFC is Marginal Factor Cost

$$MVP = MPP \times P_y = b_i P_y$$

$$MFC = P_x$$

IF $r = 1$; resource is efficiently used

$r > 1$; resource under-utilized

$r < 1$; resource over- utilized

Table 3: Measure of resource efficiency

Resources	r- value
Fertilizer	0.3439
Farm Size	1.8872

Source: Field Survey, 2022.

The results in table 3 showed that fertilizer as a resource in the production was over-utilized ($r < 1$); while farm size was under-utilized ($r > 1$).

Constraints Associated with Groundnut Production

Table 4: Distribution according to the Constraints associated with Groundnut Production.

Constraints	Frequency	Percent
Lack of rainfall	57	38
Lack of fertilizer	30	20
Insecurity	69	46

Finance	47	32
Transport	37	25
Post-harvest loss	47	32

Source: Field survey, 2022.

The result in table 4 showed that the major problems confronting groundnut farmers in the area include insecurity (46%) lack of rainfall (38%) finance (32%) post-harvest loss (32%) transport (25%) and lack of fertilizer (20%).

Conclusion and Recommendations

The study has shown that the factors which influence the yield of groundnut include fertilizer, labour, herbicides, pesticides and farm size. Also, the result of the research showed that fertilizer as a resource in the production was over-utilized ($r < 1$); while farm size was under-utilized ($r > 1$). The constraints faced by groundnut farmers in the study area include insecurity, lack of rainfall, finance, post-harvest loss, transport and lack of fertilizer. Therefore, it is recommended that the issue of insecurity in the area should be given a top priority by the government at all levels. Also, more young people in the area should be encouraged to engage in groundnut farming to efficiently utilize the available vast farmland which had been shown to be under-utilized. Government should make groundnut farming more attractive to them by providing incentives such as input subsidies, modern farm implements etc.

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