

## **SOCIO-ECONOMIC FACTORS AFFECTING GROUNDNUT PRODUCTION IN SABONGARI LOCAL GOVERNMENT OF KADUNA STATE, NIGERIA**

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### **Abstract**

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*Groundnut an important oil seed crop provides significant sources of cash through the sales of seed, cakes, oil and haulms. Groundnut plays an important role in the diets of rural populations. Groundnut pod yields from farmer's field are low, averaging about 800 kg per ha, less than one-third the potential yield of 3000 kg per ha. This large gap is of concern and in view of this, the study was carried out to assess the socio economic characteristics of groundnut farmers, determine the level of profitability of groundnut production, the resource use efficiency as well as to find out problems encountered in groundnut production in Sabon-gari local government area. Seventy-nine farmers involved in groundnut production were randomly selected from the various farms located within the local government area. Data were collected using primary and secondary sources. To examine the profitability of groundnut production, the gross margin and cost benefit analysis were carried out. The result of the study shows that experienced farmers are less involved in groundnut production and most groundnut farmers are engaged in other form of businesses. The cost, availability, and lack of technical knowledge of inputs requirements are responsible for poor use of the inputs. Labour, fertilizer, seed and herbicides are all over utilized except insecticide which is underutilized. Among the problems encountered in groundnut production in the study are lacks of capital and extension services. These two problems accounted for over 78% of the problem of groundnut in the study area. It is therefore recommended that government and research institutes should strengthen extension services to deliver improved technologies to the farmers. Farmers are also advised to source for loans through cooperatives, banks and other available sources at low charges and the procedure for loan should be made simple to enable farmers' access loans so that groundnut production can be improved.*

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**Keywords:** *Groundnut, Gross margin, Cost-benefit ratio*

## **1. Introduction**

Groundnut (*Arachis hypogaea* L.) is the 6<sup>th</sup> most important oil seed crop in the world. It contains 48-50% oil, 26-28% protein and 11-27 % carbohydrate, minerals and vitamin (Mukhtar, 2009). Groundnut is grown on 26.4 million hectare worldwide, with a total production of 37.1 million metric tons and an average productivity of 1.4 metric tons /ha. Developing countries constitute 97% of the global area and 94% of the global production of this crop (FAO, 2011). The production of groundnut is concentrated in Asia and Africa, where the crop is grown mostly by smallholder farmers under rain-fed conditions with limited inputs). Nigeria was the third highest producer of groundnut in the world after China and India with a production of 16,114,231, 6,933,000 and 2,962,760 tons respectively in 2011. In Nigeria, the crop is presently grown throughout the country with the exception of the riverine and swampy areas. Groundnut is either cultivated sole or in mixtures with other crops like maize, sorghum, millet or cassava. Fifty five percent of the groundnuts produced in Nigeria are in mixtures (Anonymous, 2004)). In Nigeria, the leading producing states include Niger, Kano, Jigawa, Zamfara, Kebbi, Sokoto, Katsina, Kaduna, Adamawa, Yobe, Borno, Taraba, Plateau, Nasarawa, Bauchi, and Gombe States (NAERL, 2011).

Groundnut has contributed immensely to the development of the Nigerian economy. From 1956 to 1967, groundnut products including cake and oil accounted for about 70% of total Nigeria export earnings, making it the country's most valuable single export crop ahead of other cash crops like cotton, oil palm, cocoa and rubber (Harkness *et al.*, 1976). Presently, it provides significant sources of cash through the sales of seeds, cakes, oil and haulms (Olorunju *et al.*, 1999). Groundnut plays an important role in the diets of rural populations, particularly children, because of its high contents of protein and carbohydrate. It is also rich in calcium, potassium, phosphorus, magnesium and vitamin E. Groundnut meal, a by-product of oil extraction, is an important ingredient in livestock feed. Groundnut haulms are nutritious and widely used for feeding livestock. The groundnut oil is composed of mixed glycerides, and contain a high proportion of unsaturated fatty acids, in particular Oleic (50-56%) and Linoleic (18-30%) (Young, 1996). Groundnuts are also important in the confectionary trade and the stable oil is preferred by the deep-frying industries since it has a smoke point of 229.4°C compared to 193.5°C of soybean oil. The oil is also used to make margarine and mayonnaise (Hul, 1996). Confectionary products such as snack nuts, sauce, flour, peanut butter and cookies are made from high quality nuts of the crop. In the Northern part of Nigeria, apart from being consumed whole, edible groundnuts are processed into or included as an ingredient in a wide range of other products which includes groundnut paste which is fried to obtain groundnut cake (*kuli kuli*), salted groundnut (*gyada mai gishiri*), a gruel or porridge made with millet and groundnut (*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. They could also be used as bulk in livestock rations or in making chipboard for use in joinery (Mukhtar, 2009). Groundnut pod yields from farmers' field are low, averaging about 800 kg ha<sup>-1</sup>, less than one-third the potential yield of 3000 kg ha<sup>-1</sup>. This large gap between actual and potential yields is due to several factors, including non-availability of seeds of improved varieties for a particular ecology, poor soil fertility, inappropriate crop management practices, pests and diseases (Ahmed *et al.*, 2010).

In developed countries, groundnut yield has been rising 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. However, in Africa, groundnut yield are still as low as 0.5 to 1.0 tons per hectare. This is in-spite of efforts by various research institutes

such as The Institutes for Agricultural Research, (IAR) Samaru, Zaria. National Agricultural Extension Research and Liaisons Services (NAERLS) And International Crop Research Institutes for Semi-Arid Tropics (ICRISAT), e.t.c. in undertaking research on various aspects of production and improvement of the crop. It is in view of the above mentioned problems that this study was carried out to assess the socio economic characteristics of groundnut farmers to determine the level of profitability of groundnut production and resource use efficiency as well as to find out problems encountered in groundnut production in Sabon-gari local government area of Kaduna State, Nigeria.

## 2. Materials and Methods

The study was conducted in Sabon gari local government area of Kaduna state of Nigeria. Sabon gari is located in the Northern Guinea Savannah Zone of Kaduna state. The local government area is situated on a plateau of a height of about 700m above sea level of latitude  $11^{\circ} 12' N$  and longitude  $7^{\circ} 8'E$ . The study area has two distinct seasons which are dry and wet seasons. The rainfall extends from April to October and average annually between 100 to 1000mm with a mean temperature ranging from  $27.20^{\circ}C$  to  $35^{\circ}C$  in the month of April. The local government area has an estimated population of farming families of about 246,544. It consists also of 11 wards out of which Sabon gari and Bassawa are the main ward. The wards are as follow: Samaru, Jama'a, Bassawa, Hanwa, Dogarawa, Chikagi, Muchia, Zabbi, Jushi, Angwa gabas and Bomo wards. Predominant language is Hausa and majority of the populace are Muslims. The major crop grown in this area includes millet, groundnut, cowpea, sugarcane, rice and vegetables such as tomatoes, onions, pepper are cultivated. The major livestock kept are goats, sheep, cattle and poultry. The farmers in the study area use simple farm implements such as hoes, cutlass and human labour mostly. The farm economy is characterized by small size and fragmented land holdings.

The study adopted a cross-sectional sample survey design. The population of farmers involved in the study are groundnut farmers in Sabon gari local government area of Kaduna state. Seventy-nine farmers were randomly selected from the various farm located within the local government area. These farmers are actively involved in the cultivation of groundnut crop coupled with other minor crops.

Data were collected using primary and secondary sources. The primary data were collected through the use of structured questionnaire. Questions asked were purely on the practical aspect of the farmers work and a bit of their opinions. Books and literatures coupled with interviews were also used to collect data used for the study. The analytical tools used for the study were descriptive and inferential statistic. The descriptive statistics involved the use of frequency distribution, percentages and means. To examine the profitability of groundnut production in the study area, the gross margin and cost- benefit analysis was carried out. The gross margin analysis is the difference between the total revenue and the total variable cost i.e  $GM = TR - TVC$

Where  $GM =$  Gross margin

$TR =$  Total revenue

$TVC =$  Total variable cost.

The cost- benefits (C.B.) analysis which is also known as the profitability index, measures the rate of return on investment. It gives the amount of profit on any Naira. It is expressed as thus; Cost-benefit ratio =  $GM / VC$  the cost of the inputs and price of the products were obtained from market survey.

Estimation of resource use efficiency (r) was computed as follows

$$r = \frac{\text{Marginal Value Product}}{\text{Marginal Factor Cost}}$$

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Marginal factor cost (MFC) = Cost of one unit of a particular resources. The marginal value product (MVP) was estimated as follows  $MVP = MPP \times P$  where MPP = Marginal physical product and P = unit price of output

If  $r=1$ , implies that resources are efficiently utilized i.e  $MVP=MFC=1$

If  $r>1$ , it implies that resources are over utilized i.e.  $MVP > MFC$

If  $r < 1$  it implies that resources are underutilized i.e  $MVP < MFC$

### **3. Result and Discussion**

The socio economic characteristic of groundnut farmers in the study area as shown in Table 1 indicates that the majority of the farmers (48.1 %) fall within the active age. Most of the farmers (55.16 %) have other occupations apart from farming. Farming is not their primary occupation. Apart from the 17.72 % who do not have any form of formal education, others have one form of education or the others. The implication of this is that adoption of new technology will be easily assimilated. Farmers with long years of experience are less involved in groundnut production and this is because they have discovered that groundnut production is not profitable. Over 63% of the farmers do not use improved seeds and 75.95% source their seeds from local markets. 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. Majority of the farmers (59.49%) do not apply fertilizers during groundnut production because of unavailability, inability to afford it and lack of technical knowledge on fertilizer requirements of groundnut. Among the 40.5% that use fertilizers, 60.76% of them use poultry manure. Among the organic manure, poultry manure is more available as compared to the other manures in the study area. The poultry manure is used without any scientific recommendation. Among the different pesticides used by farmers, insecticides (40.51%) are the most used even though about 22.78% do not use any pesticides. The recommended insecticide under normal condition is estimate at 1 liter per hectare which coincides with what the farmers are using. Only 24.05 % of the farmers use herbicides on their farms. This implies that 75.95 % of the farmers use hoe weeding, animal traction and heavy machines in weed control. This may not be sustainable because of the high cost and lack of labor particularly at the peak of the seasons as opined by Ibrahim *et al.*,(2012) that hoe 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. Majority of the farmers use between 1 -5 liters of pesticides per hectare which is not adequate .An average of 8 liters of pesticide is required per hectare for groundnut production (Ibrahim *et al.*, 2012). Most of the farmers (83.54 %) 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. Majority of the farmers (89.87 %) involved in groundnut production are male. The majority of the farmers are small scale farmers as indicated in the result. The females in the study area are mostly full time house wives or are engaged in trading. The average yield recorded by the farmers ranged between 500-1500kg ha<sup>-1</sup>. Of this the majority of the farmers (68.35%) get yield between 501-800kg ha<sup>-1</sup> while only about 16.46 % get yield above 1,000kg ha<sup>-1</sup>. The yield recorded in the study area is very low as compared to what is obtained in other parts of the world. The average yield was estimated at 1,400Kg ha<sup>-1</sup> and the potential yield of 3000 kg ha<sup>-1</sup> has been achieved in some part of the world (FAO, 2011).

The estimated efficiency ratio in Table 2 shows that land, labour, fertilizer, seed and herbicides are all over utilized except insecticide which is underutilized. The gross margin of ₦7,000 equivalent to 44 US \$ for the period of four months indicated a low profitability for farmers in the study area. Similarly, the 16% cost-benefit ratio also indicated a low rate of return for groundnut farmers in the study area. Among the problems encountered in groundnut production in the study are lack of capital (41.77%) and lack of extension (36.70%). These two problems accounted for over 78% of the problem of groundnut production in the study area. Due to lack of capital, farmers were not able to adequately purchase all the required inputs. Adequate extension services will help the farmers to ensure compliance to good agricultural practices and rational inputs usages

**Table 1: Socio- economic characteristic of farmers in the study area**

<b>Characteristic</b>	<b>Number of farmers</b>	<b>Percentage</b>
<b>Age</b>	<b>Frequency</b>	<b>Percentage</b>
10-25	8	10.13
26-40	38	48.10
Above 40	33	41.77
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Farming System</b>	<b>Frequency</b>	<b>Percentage</b>
Full time	37	46.84
Part time	42	53.16
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Educational background</b>	<b>Frequency</b>	<b>Percentage</b>
No education	14	17.72
Adult education	12	15.19
Primary education	18	22.78
Secondary education	5	6.30
Others	30	37.98
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Farming experience</b>	<b>Frequency</b>	<b>Percentage</b>
1-5	34	43.04
6-15	25	31.65
16-30	16	20.25
Above 30	4	5.06
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Types of seeds</b>	<b>Frequency</b>	<b>Percentage</b>
Improved groundnut	18	22.79
Local groundnut	50	63.29
Both improved and local	11	13.92
Others	0	0
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Quantity of fertilizer used</b>	<b>Frequency</b>	<b>Percentage</b>
Nil	47	59.49
50- 100kg	3	3.80
101-200kg	10	12.66
201-3000kg	19	24.05
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Types of fertilizer used</b>	<b>Frequency</b>	<b>Percentage</b>

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Poultry manure	48	60.76
cow dung	10	12.66
Inorganic	18	22.78
Others	3	3.80
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Sources of labour</b>	<b>Frequency</b>	<b>Percentage</b>
Family labour	17	21.50
Hired labour	41	51.90
Both family and hired	21	26.58
Communal labour	0	0
Others	0	0
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Sources of seeds</b>	<b>Frequency</b>	<b>Percentage</b>
Local market	60	75.90
Ministry of Agriculture	2	2.53
Research institute	7	8.86
Others	10	12.66
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Pesticides Usage</b>	<b>Frequency</b>	<b>Percentage</b>
Herbicides	19	24.05
Insecticides	32	40.51
Seed dressing	1	1.27
All of the above	9	11.39
Others	0	0
No response	18	22.78
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Quantity of pesticides</b>	<b>Frequency</b>	<b>Percentage</b>
1-5 litres	30	37.98
6-10 litres	29	36.71
Above 10 litres	9	11.39
No response	11	13.92
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Seed rate</b>	<b>Frequency</b>	<b>Percentage</b>
One seed per hole	10	12.66
2-3 seeds per hole	66	83.54
4-5 seeds per hole	3	3.80
Others	0	0
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Farm size (Ha)</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 1	30	37.98
1-2	29	36.71
2-5	9	11.39
More than 5	11	13.92
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Gender</b>	<b>Frequency</b>	<b>Percentage</b>
Male	71	89.87
Female	8	10.13
<b>Total</b>	<b>79</b>	<b>100</b>
<b>Yield of groundnut (Kg)</b>	<b>Frequency</b>	<b>Percentage</b>
Less than 500	0	0
500-800	54	68.35

801-1000	12	15.19
1001-1500	13	16.46
Greater than 1500	0	0
<b>Total</b>	<b>79</b>	<b>100</b>

**Table 2: Estimated Efficiency Ratios**

Inputs	MVP	MFC	r=mvp/mfc
Land	500	5,000	0.10
Labour	114	22,000	0.01
Fertilizer	250	10,000	0.03
Seed	833	3,000	0.28
Insecticides	2,500	1,000	2.50
Herbicides	1,250	2,000	0.63

**Table 3: Profitability of groundnut production in Sabon gari local government**

Variable Inputs	Cost (Naira per ha.)	Percentage cost
Land	5,000	11.63
Labour	22,000	51.16
Fertilizer	10,000	23.26
Seed	3,000	6.98
Insecticides	1,000	2.33
Herbicides	2,000	4.65
TVC	43,000	
Average yield ( Kg)	1,000	
Price	50	
TR	50,000	
GM	7,000	
CBR	0.16	16

**Table 4: Problems encountered in groundnut production in Sabon gari local government**

Problems	Frequency	Percentage
Lack of fertilizer	3	3.80
Poor markets	7	8.86
Lack of improved seeds	4	5.06
Lack of pesticides	3	3.80
Lack of capital	33	41.77
Lack of extension and training	29	36.71
Total	79	100

#### **4. Conclusion and Recommendation**

The results of the study shows that the majority of the farmers fall within the active age and are educated which will enhance adoption of new technology. Experienced farmers are less involved in groundnut production while most groundnut farmers are engaged in other form of businesses because groundnut production is not profitable. The cost, availability,

affordability and lack of technical knowledge of improved seeds, herbicides and fertilizer requirements are responsible for poor use of these inputs. The availability of poultry manure makes it readily used by farmer which is used without any scientific recommendation. Land, labour, fertilizer, seeds and herbicides are all over utilized except insecticides which is underutilized. The gross margin and cost – benefit analysis indicated a low profitability for farmers in the study area. Among the problems encountered in groundnut production in the study are lack of capital and lack of extension. These two problems accounted for over 78% of the problem of groundnut in the study area. Because of lack of capital, farmers were not able to adequately purchase all the required inputs. Adequate extension services will help the farmers to ensure compliance to good agricultural practices and rational inputs usages.

It is therefore recommended that government and research institutes should strengthen extension services to deliver improved technologies to the farmers. Farmers are also advised to source for loans through cooperatives, banks and other available sources at low charges. The procedure for loan should also be made simple to enable farmers access loans so that groundnut production can be improved in Sabogari local government of Kaduna State, Nigeria

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