



ECONOMICS OF GROUNDNUT PRODUCTION IN TSANYAWA LOCAL GOVERNMENT AREA OF KANO STATE, NIGERIA

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ABSTRACT

The study examined the economics of groundnut production in Tsanyawa Local Government Area of Kano State. A combination of purposive and random sampling technique was used to select 150 groundnut farmers. Data were collected using structured questionnaire and analyzed descriptive statistics, gross margin and regression analysis. The results indicated that, the mean age of the farmers was 33 years with a mean household size of eight persons. The farmers cultivated an average of 2.5 hectares. The gross margin was ₦37, 850 per hectare, with the rate of return on investment of ₦1.10. The gross, operating and fixed ratios were 0.54, 0.52 and 0.03, respectively. The regression analysis revealed an R^2 value of 0.97 which implies that 97% percent of the total variation in the gross income of the farmers was explained by the independent variables included in the model. The major constraints encountered in groundnut production in the study area were inadequate capital, inadequate improved seed, pests and diseases. The study concluded that groundnut production in the study area was profitable. Therefore, it was recommended that extension service should be geared towards delivery of improved technologies to groundnut production in the study area. Groundnut farmers should form cooperative societies so as to pool their resource together to solve their common problem and take advantage of economy of scale. There is need for government to subsidize cost of inputs for groundnut producers, such as seeds, fertilizer, pesticides, and herbicides.

Keyword: Analysis, Economic, Groundnut, Production, Tsanyawa.

INTRODUCTION

Groundnut (*Arachis hypogaea* L.) belongs to the genus *Arachis* in family *leguminaceae*. It is a native of tropical South America, originated from Brazil where the Portuguese introduced it to West Africa (Craufurd *et al.*, 2006) which has replaced the traditional bambara groundnut (*Vigna Subterranean*) in many areas of the country (Baiyegunhi and Fraser, 2009; and Nwanosike, 2011). It is also called peanut, goober, finder or earthnut and its products form an important part of the diet of people in Nigeria (Abba, 2005). Groundnut seeds contain high quality edible oil (50%), easily digestible protein (25%) and carbohydrates (20%). It is grown on 26.4 million hectares worldwide with a total production of 36.1 million metric tons, and an average productivity of 1.4 metric tonnes per hectare (Food and Agriculture Organization [FAO], 2009). According to Olawepo (2012), majority of the rural



populace in Nigeria either depends entirely on farming and farming activities for survival and generation of income.

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%) (Pound and Phiri, 2010). 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 (Girei *et al.*, 2013). 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 include 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 per hectare, less than one-third of the potential yield of 3000 kg per hectare. This large gap between actual and potential yields is due to several factors, including non-availability of improved seeds varieties for a particular ecology, poor soil fertility, inappropriate crop management practices, pests and diseases (Ahmed *et al.*, 2010). It is in view of the importance of the crop that this study seeks to investigate the economics of groundnut production in Tsanyawa Local Government Area of Kano State, Nigeria.

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 tonnes per hectare. However, in Africa, groundnut yields are still as low as 0.5 to 1.0 tonne per hectare. McGuire (2007) estimated that Nigeria's cultivated area under groundnut was about 1.0 to 2.5 million hectares annually and yield range from 500-3000 kg per hectare. In Nigerian agricultural sector, the small operators face pure competition both at production and marketing stages. 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) in undertaking research on various aspects of production and improvement of the crop. Therefore, the study was carried out to assess the economics of groundnut production in Tsanyawa Local government Area of Kano State, Nigeria. The specific objectives of the study were to:

- i. describe the socio-economic characteristics of groundnut farmers in the study area,
- ii. determine costs and return of groundnut production,
- iii. determine factors influencing groundnut production, and



- iv. describe constraints to groundnut production in the study area.

Production of groundnut plays an important role to the economic development of the rural farmers through provision of food and revenue. It is a cheap source of protein both in quality and quantity. Despite the significance of groundnut production in the study area, there is no study conducted on economic analysis of groundnut production in Tsanyawa Local Government Area of Kano State, Nigeria. The availability of information on production systems may help the producers to improve production and productivity of agricultural products by inducing farmers to use the best management practices. In fact, the availability of this kind of information may help government to decide on the extent to which it should promote groundnut production. It is believed that the findings of the study could be useful to producers. It is also expected that the study will provide an analytical framework for individuals, NGO, government and financial institutions in policy formulation on groundnut production in the study area. Finally it is hoped that the research work will be of assistance to researchers who wish to identify other areas for further studies.

MATERIALS AND METHODS

The Study Area

The study was conducted in Tsanyawa Local Government Area (LGA) of Kano State. The LGA is bordered on the east by Bichi and Kunchi LGAs, to the south by Shanono and Bagwai LGAs, to the west are Kusada and Kankia LGAs of Katsina State, while to the North is Ingawa LGA of Katsina State. It has a total land area of 492 Km². The area lies within the Sudan Savannah vegetation zone. According to National Bureau of Statistics (NBS, 2013), with the recent increase in the rate of population growth (3.2% per annum), Tsanyawa L.G.A has an estimated population of 555,868 persons. The predominant ethnic groups of the area are Hausa and Fulani. Their major occupation is farming. The major crops grown throughout the LGA are maize, groundnut, millet, sorghum, cotton, cowpea, and vegetables (Kano State Agricultural and Rural Development Authority [KNARDA], 2010).

The study area has two distinct seasons (dry and rainy seasons). The dry season starts from October to April while the rainy season commence from May to September. During the months of December and January, the harmattan is at its peak. At this time, temperature can fall to as low as 19°C. As from March to May however, the dry hot air turns up to above 31°C. Rainfall is concentrated from June to August and the rains are preceded by the violent dust-storms followed by tornadoes mainly during the month of May and at close of rains in September and early October. The average annual rainfall is 734.10mm (KNARDA, 2010).

Sampling Techniques and Sample Size

The sampling techniques comprise of purposive and simple random sampling. Tsanyawa LGA consist of 10 Wards namely, Daddarawa, Dumbulun, Gozarki, Gurun, Kabagiwa, Tatsan, Tsanyawa, Yankamaye, Yanganau and Zarogi. Three villages were purposively selected from each ward based on groundnut production capacity. A list of 450 contact farmers was obtained from Kano State Agricultural Development Programme out of



which 50 contact farmers were randomly selected from each village making a total of 150 groundnut farmers in the study area.

Data Collection and Analysis

The data required to achieve the objectives of the study were collected through the use of structured questionnaire. Data were analysed using descriptive statistics, gross margin and regression analysis with the aid of statistical package for social scientists (SPSS) version 21.

Descriptive statistics was employed to achieve objectives i and iv of the study. The measures used include percentages, frequency distribution and mean.

Gross margin analysis was employed to achieve objective ii of the study as:

$$GM = TR - TVC \quad \dots(1)$$

where;

GM = Gross Margin

TR = Total Revenue

TVC = Total Variable Cost

Multiple regression analysis was used to determine factors influencing groundnut production in the study area. Specification of the model:

The multiple regression model is implicitly expressed as:

$$Y = a_0 + b_1X_1 + \dots + b_nX_n + e \quad \dots(2)$$

However, the explicit form is expressed as:

$$Y = a_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6X_6 + b_7X_7 + b_8X_8 + b_9X_9 + b_{10}X_{10} + e \quad \dots(3)$$

where;

Y = Gross margin (₦)

X₁ = Farming experience (years)

X₂ = Farm size (ha)

X₃ = Quantity of seed (kg)

X₄ = Cost of Planting (₦)

X₅ = Cost of Ridging (₦)

X₆ = Cost of Land preparation (₦)

X₇ = Cost of Empty sack (₦)

X₈ = Cost of weeding (₦)

X₉ = Cost of Fertilizer application (₦)

X₁₀ = Cost of Harvesting (₦)

a₀ = Intercept

b_i...b_n = Co-efficient

e = Error term

RESULTS AND DISCUSSION

Socio-Economic Characteristics of the Groundnut Farmers

The main aspect of the socio-economic characteristics of the groundnut producers covered include age, household size, experience in farming and farm size. The socio-economic characteristics of the groundnut farmers were presented and discussed.



Age plays a significant role in groundnut production in the study area. It was a determining factor in the adoption of new technology. According to Ogunbameru *et al.* (2006), the highest adoption of innovation was found among middle aged and young farmers who were energetic and willing to accept new ideas. Ages of the groundnut farmers was presented in Table 1. The result indicates that, the minimum age of farmer was 23 years and maximum age was 63 years with mean age of 33 years. This implies that, the age range consists of young people who were ready to take risk in order to earn profit. This agrees with Ogunsumi (2005) who reported that farmers in their middle age were economically active which could result in a positive effect on production.

A household consist of head, wives, children and extended family relations. According to Ogungbile *et al.* (2002), household size is the total number of individuals who live within and feed in the same house. He also stated that their contribution may be either positive or negative related to the family size depending on the magnitude of age structure and the amount of labour contribution among members. Table 1 shows that the minimum house hold of the groundnut producers was 5 persons and the maximum was 11 persons while the mean household size was 8 persons. This is consistent with the results of Ojiako and Ogbukwa (2012) which showed the average household size of farmers was 7 persons in Ogun State, Nigeria.

Farming experience is gained with the number of years put in farming which can be linked to the age of the farmer. The older the farmer, the more experienced he is and the better his understanding of farming practices. The result presented in Table 1 shows that, the minimum farming experience was 3 years and maximum was 27 years with mean farming experience of 12 years. Olorunju *et al.* (1999) reported that farmers with long years of experience were less involved in groundnut production.

Land is one of the basic resources in farming. The extent to which cultivable land is available to individual farmer determines the crop to be cultivated and how it was cultivated (Onaiah *et al.*, 2007). Table 1 presents the total number of hectares the farmers cultivated during the period under consideration. The results revealed that, the minimum farm size under groundnut cultivation was 0.3 ha and maximum was 9 ha with mean of 2.5 ha. This indicates that, majority of the groundnut farmers in the study area engaged more in small scale production cultivating less than three hectare. The possible reason might be due to inheritance from generation to generation (Sathish *et al.*, 2012).

Table 1: Socio-economic Characteristics (Age, Years of Experience, Household Size and Farm Size) of Groundnut Farmers

Variables	Minimum	Maximum	Mean
Age (years)	23	62	33
Household size	5	22	8
Years of farming experience	3	27	12
Farm size (ha)	0.3	9	2.5



The results further revealed that 65.3% of the farmers were males and only 34.7% were females. Ajani (2008) reported similar findings in Northern Nigeria, norms dictate that women should be less involved in on-farm but more involved in off-farm as presented in Table 2. Furthermore, the results showed that 72.7% of the farmers were married and 27.3 % were single. This could be attributed to the fact that people in the study area believed that marriage is an essential obligation. In addition, the contribution of marital status on agricultural production can be explained in terms of the supply of family labour.

Table 2: Distribution of groundnut farmers according to Sex, Marital Status and Level of Education

Variable	Frequency	Percentage
Sex		
Male	98	65.3
Female	42	34.7
Marital status		
Single	41	27.3
Married	109	72.7
Level of education		
Non formal education	101	67.4
Primary education	29	19.3
Secondary education	14	9.3
Post-secondary education	6	4.0
Total	150	100

Education provides farmers with the ability to read and write, handle and interpret messages relating to their farm operation. The results show that 67.4% of the farmers attained non formal education while 15% acquired primary education. Among the farmers 25% acquired secondary education and only 13% of the farmers acquired post secondary education as presented in Table 2.

Factors Influencing Groundnut Production

The coefficient of farm size was significant ($P<0.001$) (Table 3) indicating that increase in farm size will increase output of the farmer thereby increasing the gross margin of the farmer. Quantity of seed used and cost of weeding was also significant ($P<0.05$). The coefficients of cost of ridging and cost of harvesting were significant ($P<0.05$) and negative which implied that increase in these two variables will result in the decrease in gross margin of the farmer. This was in line with findings of Olayemi (1998) and Chukwuji (2007) who reported that that age of farmers, years of farming experience, years of education and farm size were among the factors influencing farmer's productivity. The results revealed that, the coefficient of multiple determinations (R^2) was 0.72 which implies that 72% of the total variation in the gross margin of the farmer was explained by the independent variables included in the model as presented in Table 3.



Table 3: Factors that Influencing Groundnut Production in the Study Area

Variables	Coefficient	Standard Error	T-value
Constant	11.970		3.672***
Farm size(ha)	.037	.142	3.846***
Quantity of seed (kg)	.170	.365	2.148*
Cost of Planting (₦)	.363	.098	0.311
Cost of Ridging cost(₦)	-.017	.006	-2.833**
Cost of Land preparation (₦)	.010	.020	0.241
Cost of Empty sack (₦)	.011	.157	0.070
Cost of weeding (₦)	.026	.010	2.621*
Cost of Fertilizer application (₦)	.019	.018	1.056
Cost of Harvesting(₦)	-.089	.032	2.772**

R² = 0.72

F= 45.101**

*** Significant at P<0.001, ** Significant at P<0.01 and * Significant at P<0.05

Average Costs and Returns of Groundnut Production

The results of Table 4 revealed that, the average cost of weeding, fertilizer, harvesting and ridging constituted 29.89%, 18.06%, 14.19%, and 8.72% of the total variable cost, respectively. Additionally, cost of planting, pesticide, fertilizer application, land preparation and seed constitutes 7.22%, 5.73%, 4.23%, 3.49% and 3.23% of the total variable cost, respectively while cost of transportation and empty bags constitute 1.98% and 1.25% of the total variable cost, respectively. The total cost of production, as indicated in Table 4 was ₦42,270 per hectare. The results further revealed that the total variable cost accounted for 94.99% of the total cost of production, while the fixed cost accounted for 5.09%. This finding was in line with those of Ojo *et al.* (2009) and Abdullahi *et al.* (2010) who in their separate studies found variable costs accounting for 90.12% and 92.55% of the total cost, respectively.

The gross margin in the study area was ₦37,850/ha. The return on investment was 1.10 which implies that for every ₦1 spent by farmer on groundnut production 10 kobo was realized as profit while gross, operating and fixed ratios were 0.54, 0.52 and 0.03 respectively. The entire ratios were less than 1 which indicates that groundnut farming was profitable. This finding was in line with those of Abdullahi *et al.* (2010); Odoemenem and Inakwu, (2011); Abba (2005); Ojo *et al.* (2009); Edeh and Igberi (2009) and Omolehin *et al.* (2011) who recorded gross, operating and fixed ratios of less than 1.0 in arable farming.



Table 4: Average Costs and Return of Groundnut Production per Hectare

Costs and return items	Amount (₦)	Percentage
Land preparation	1,400	3.49
Ridging	3,500	8.72
Seed	1,300	3.24
Planting	2,900	7.22
Pesticide	2,300	5.73
Fertilizer	7,250	18.06
Weeding	12,000	29.89
Fertilizer application	1,700	4.23
Empty sack	500	1.25
Harvesting	6,500	16.19
Transport	800	1.98
Total variable costs (TVC)	40,150	94.99%
Total fixed costs (TFC)	2,120	5.01
Total costs (TC)	42,270	100
Total revenue (TR)	78,000	
Gross margin (GM)	37,850	
Returns per Naira	1.10	
Gross ratio	0.54	
Operating ratio	0.52	
Fixed ratio	0.03	

Constraints in Groundnut Production

The results revealed that inadequate capital (96.7%) was one of the most important constraints affecting groundnut farmers in the study as presented in Table 5. According to Maiangwa (2013), inadequate capital forces the poor to engage in less productive farm and non-farm enterprises, thus foregoing income. High cost of seed (82%) and incidence of pest and disease (64%) were also constraints to groundnut production in the study area. This agreed with Hamidu *et al.* (2006) who stated that high incidence of pests and disease continues to be a major problem of groundnut production in Nigeria. While only 6.7% and 3.3% of the farmers reported problems of high cost of pesticide and inadequate of labour supply, respectively.



Table 5: Constraints to groundnut Production

Constraints	*Frequency	Percentage	Rank
Inadequate capital	136	96.7	1st
Poor roads	81	54.0	4th
High cost of herbicides	26	17.3	6th
High cost of pesticides	10	6.7	8th
High cost of seed	123	82.0	2nd
High cost of fertilizer	45	30.0	5th
Inadequate labour supply	5	3.3	9th
Inadequate improved seed	11	8.0	7th
Pest and disease	96	64.0	3rd
Total	533	362	

*Multiple responses exists

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the research, it was concluded that groundnut production was profitable even though inadequate capital, high cost of seed, incidence of pest and disease were constraints to groundnut production in the study area. It was recommended that extension service should be geared towards delivery of improved technologies on groundnut production in the study area. Groundnut farmers should form cooperative societies so as to pool their resource together to solve their common problem and take advantage of economy of scale. There is need for government to subsidize cost of inputs for groundnut producers, such as seeds, fertilizer, pesticides, and herbicides.

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