

Profitability of Groundnut Production in Michika Local Government Area of Adamawa State, Nigeria

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KEYWORDS Profitability. Gross Margin. Groundnut Production

ABSTRACT The study examined the profitability of groundnut production in Michika Local Government Area of Adamawa State. Gross Margin analysis was strictly used. From the costs and return analysis, it is found that the total cost of production by farm size per hectare in the area is ₦133, 812.68; the gross margin per hectare is ₦221348.68 while the average net return per hectare is ₦40, 097.63. The findings also shows that, farmers in the area earned an average net revenue ranging between ₦17, 217.00 and ₦445, 011.35 depending on farm size which indicated that groundnut production is a profitable venture in the study area. Farmers should maintain output per hectare at a high level with the family labor at their disposal through good management and efficient use of modern inputs. Farmers with no family members should join communal labor arrangements where they will benefit from it for their farm operations.

INTRODUCTION

Groundnut is the 13th most important food crop of the world. It is the world's 4th most important source of edible oil and 3rd most important source of vegetable protein. Groundnut seeds contain high quality edible oil (50%), easily digestible protein (25%) and carbohydrate (20%). It is grown on 26.4million ha worldwide with a total production of 36.1 million metric tons, and an average productivity of 1.4 metric tons ha⁻¹ (FAO 2004).

Groundnut is grown in nearly 100 countries with China, India, Nigeria, USA, Indonesia and Sudan as major producers. Developing countries accounted for 96% of the global groundnut area and 92% of the global production. Asia accounts for 58% of the global groundnut area and 67% of the groundnut production with annual growth rate of 1.28% for area, 2.00% for production and 0.71% for productivity. Globally, 50% of groundnut produce is used for oil extraction, 37% for confectionery use and 12% for seed purpose. In India, 80% of the total produce is used for oil extraction, 11% as seed, 8% direct food uses and 1% is exported. Groundnut haulms (vegetative plant part) provide excellent hay for feeding livestock (Roland 1999).

Okolo and Utoh (1999) estimated that Nigeria's cultivated area under groundnut cultivation is about 1.0 to 2.5 million hectares annually and yield in the range of 500 – 3000 kg/ha.

Rowland (1999) reported that seed yield in Northern Nigeria is about 3000 Kg/ha.

Adamawa Agricultural Development Programme, ADADP (1996) enumerated groundnut varieties commonly grown in Adamawa State to include the following: Ordaaji; Local (2 nuts/shell), Kwamakuni; Local (3 nuts/shell), Local (2 nuts/shell but larger), Kwathrumthrum; Kampala (striped brown/white nuts) and Kwanyambi or Ex Dakar. According to Kadams (1995), the first three local types listed predominates production in the old days but recently most people prefer to grow the new Kampala type which attracts money due to its high yield and oil contents.

Idama (2000) reported that revenue generation is perhaps the most important responsibility of modern government. As the welfare needs of the people increase, sources of generating revenue to meet the need must be found. The author is of the view that, had we kept on investing heavily on such wealth generating activities as groundnut and other agricultural business, the lots of farmers would have greatly improved. Iyalla (2004) reported that the need to maximize yield per unit area of cultivated hectares of land is of great importance in farming, particularly in wet land farming, considering the cost of inputs in terms of plant nutrient and manpower.

In Nigerian agricultural sector, the small operators face pure competition both at production and marketing stages. Because of this structure,

output is sold at industry – determined price and profit depends on how large the per unit output price is compared to the unit cost of production. If the per unit output price is large, the operators earn pure profits in the short run. Invariably, the outcome of the pattern of structure and conduct is the performance, which is interpreted by the profit or marketing margins among other things (Eyo 2004). This study was done just to determine the profitability of groundnut production in the study area.

Hypothesis

Ho: Groundnut production is not profitable

METHODOLOGY

Multistage stratified and purposive sampling techniques were adopted for the study. This involved the selection of 4 districts, 8 wards, 24 villages and 143 farmers selected proportionate to the number of groundnut farmers in the villages. Primary sources of data were used. Primary data were collected using structured questionnaires, which was administered on the farmers. The input – output data were collected on each farm. These include hectareage of groundnut cultivated, quantity of fertilizer applied, quantity of seed used and quantity of input and output obtained. Information was also obtained on household characteristics such as age, family size, educational qualification, farming experience and farm size. The services of enumerators from the Ministry of Agriculture and Extension agents from Adamawa Agricultural Development Programme Michika were employed to facilitate the collection of data.

Gross Margin Analysis

The gross margin analysis was used to estimate the cost and return per hectare and per groundnut farmer. The GM is defined as:

$$\text{Gross margin} = \text{TR} - \text{TVC} \quad \dots\dots\dots(1)$$

$$\text{NFI} = \text{GM} - \text{TFC} \quad \dots\dots\dots(2)$$

Where:

GM = Gross Margin

TVC= Total Variable Cost

TFC= Total Fixed Cost

NFI= Net Farm Income

TR= Total Revenue

Value was imputed on family Labour by multiplying total man-days of family labour by the wage rate in each village.

Total Fixed Cost (TFC) is the depreciation on fixed assets (farm tools and implement) such as hoes, cutlass, sprayers etc., and straight-line depreciation method was used, that is;

$$D = \frac{p - s}{n} \quad \dots\dots\dots(3)$$

Where:

D = present value of asset

P = Present value of asset

S = Salvage value

N = Number of useful years

Groundnut production is said to be profitable if the gross farm income is greater than total cost of production.

Average gross margin per hectare was estimated using thus;

$$\text{ANR (Ha)}^{-1} = \frac{\sum_{i=1}^N \text{TR}_{ij}}{\sum_{i=1}^N \text{FZ}_{ij}} - \frac{\sum_{i=1}^N \text{TVC}_{ij}}{\sum_{i=1}^N \text{FZ}_{ij}} + \sum_{i=1}^N \text{DEP}_{ij} \quad \dots\dots\dots(4)$$

Average gross margin per farmer was estimated using thus;

$$\text{ANR (N}_{jk})^{-1} = \frac{\sum_{i=1}^N \text{TR}_{ij}}{\sum_{i=1}^N \text{FZ}_{ij}} - \frac{\sum_{i=1}^N \text{TVC}_{ij}}{\sum_{i=1}^N \text{FZ}_{ij}} + \sum_{i=1}^N \text{DEP}_{ij} \quad \dots\dots\dots(5)$$

Where:

ANR (Ha)⁻¹ = Average net revenue per hectare

ANR (N_{jk})⁻¹ = Average net revenue per hectare

TR_{ij} = Total revenue accounting to the ith groundnut farmer in the jth local government area.

TVC_{ij} = Total variable cost incurred by the ith groundnut farmer in the jth local government area.

DEP_{ij} = Depreciation on fixed assets of the ith groundnut farmer in the jth local government area.

FZ_{ij} = Farm size of the ith groundnut farmer in the jth local government area.

N_{jk} = Total number of groundnut farmer in the jth local government area.

RESULT AND DISCUSSIONS

Cost of Production

The average total cost per hectare of groundnut farm cultivated is presented in table 1. The total average cost consists of the following:

Table 1: Total cost of production by farm size

Farm size (ha)	Average size per farmer (ha)	Number of farmers	Average labour cost per farmer (N)	Cost of seed (N)	Transportation cost (N)	Cost of agro-chemical (N)	Cost of fertilizer (N)	Cost of empty sac (N)	Mechanization and animal traction cost (N)	Average total cost per farmer (N)	Average total cost per hectare (ha)
≤ 2.0	1.4	71	23352	1575	1269.32	1190.42	9870.04	1570.8	6200	36144.58	25817.56
2.1-4.0	3.3	51	55044	3712.5	2991.98	2805.95	7040.88	3702.6	19800	95097.91	28817.55
4.1-6.0	5.2	15	66736	5850	4714.63	4421.58	11094.72	5834.4	31200	129851.33	24971.41
6.1-8.0	8	1	103440	2760	7253.28	6802.4	17068.8	8976	48000	1224300	28037.58
>8.1	10.8	5	130144	33534	9791.93	9183.24	23042.88	12117.6	64800	282613.65	26167.93
Total/Average	5.7	143	378716	47431.5	26021.14	24403.59	59234.32	32201.4	170000	768007.95	33812.03

Source: Field Survey 2006

labour cost, seed cost, agro chemical cost, fertilizer cost, cost of transportation, cost of empty sacs and land preparation (mechanization/Traction) cost. The total fixed cost of production consist of the depreciated values of the following; fixed inputs cost; cost of hoe, axes, rakes, sprayers and ox-drawn implements.

The average number of workdays required per hectare of groundnut farm is 166 workdays. Hired labor constitutes 29 percent while family labor accounted for 71 percent of the total labor supplied. The average cost of hired labor per day was ₦400. Labor cost account for about 51.3 percent of the total average variable cost of production (Table 4). This agreed with Komolafe (1995) who reported that groundnut in Nigeria is mainly produced by small-scale farmers with limited resources. Most of the operations are done manually, which resulted in high labor demand.

On the average, 117.2kg per hectare of seed was used in the area. This is above the recommended rate of 45-60kg of shelled nut per hectare. The average cost of a kilogram of groundnut seeds was ₦71. The total average cost of groundnut seeds by farm size is ₦47, 431.50. Seed cost accounted for 6.40 percent of the total average variable cost of production (Table 2).

On the average, 5.35 litres per hectare was used. This is slightly above the recommended rate of 4-5 litres per hectare. The average cost of a litre of Agrochemical was ₦800. Agrochemical accounted for 3.3 percent of the total average variable cost of production (Table 2).

The average quantity of fertilizer applied on

Table 2: Relative input costs by farm size

Variable input	Total variable cost	Relative percent
Labour	378716	51.30
Seed	47431.5	6.40
Agro chemical	24403	3.30
Fertilizer	59234.32	8.00
Transportation	26021.4	3.50
Empty sac	32201.4	4.30
Land preparation	170000	23.10
Mechanization/Animal traction		
Total	738007.36	100.00

Source: Field Survey 2006

a hectare of land was 157.3kg, about three of 50 kg bag. The average cost per kg was ₦66, about ₦3, 300 per 50 kg bag. The quantity is below the recommended rate of 4-6 bag/ha. The common-

est fertilizer used is the single super phosphate. Out of the sampled farmers, only 30.80% applied fertilizer. This is due to inadequate supply of the commodity coupled with high cost. Inadequate fertilizer application and non-application may result in low yield. Fertilizer cost accounted for 8.0% of the total average variable cost of production (Table 2).

The average cost of transporting 100 kg of shelled groundnut to the market was ₦120. There are two major markets in the local government; Michika town central market and Bazza town market in Bazza development area. Transport cost accounted for 3.50 percent of the total average variable cost of production (Table 2).

The average cost of ploughing and harrowing a hectare was ₦6, 000. More than 75% of sampled farmers rely on government and private individual for tractor services. Less than 5% of the respondents have private tractors. This high dependence on government coupled with few tractors available often result to delayed ploughing, hence late planting. This development causes some of the farmers to resort to using ox-drawn plough, whose charges are normally higher than that of tractor. However, more than 20% of the respondents have personal work bull's use for ploughing. Cost of mechanization/animal traction accounted for 23.10% of the total average variable cost of production (Table 2).

The fixed inputs used were hoes, axes, rakes, sprayers and ox-drawn implements. The cost per hectare was computed by finding their depreciation values using straight-line method. The essence of depreciation is to enable us spread the cost of fixed inputs associated with groundnut production. For the purpose of this study, the average life span of a hoe, axe, sprayer and rake is assumed to last for 3 years.

Average yield per farmer and per hectare is found to be 11,618.03 kg and 3117.6 kg respectively. The price per kilogram on the average is ₦71, giving a gross return per farmer and per hectare of ₦824, 880.13 and ₦221, 349.68 respectively, if all the output were sold (Table 2). However, about 15% of the total out-put was retained for household consumption and gift while 85% was sold.

The average gross margin per hectare is the total value of output less total variable cost of production. Table 3 revealed that the average gross margin per hectare of an average farm was ₦221348.68. Net return on the other hand is

obtained by subtracting the value of the total fixed cost from the gross margin. The net return per hectare on the average was calculated to be ₦40, 097.63 (Table 4).

Table 1 shows that 71 farmers that had less than or equal to 2.0 hectares of farm land spent an average of ₦36,166.58 per farmer while 51 farmers who had their farm in the range of ₦2.1 44.0 or 2.1 - 4 hectares spent an average of ₦95,097.91 per farmer, 15 farmers who had their farm sizes in the range of 44.1 6.0 hectares spent an average of ₦129,851.33 per farmer while one farmer who had his farm size in the range of 6.1 8.0 hectares spent an average of ₦224,300.48 per farmer. The remaining 5 farmers framers who have 8.1 hectares or more spent an average of ₦282, 613.65 per farmer.

As seen on table 2, labor constitute 51.3 percent of the total variable cost of production.

Table 3: Average gross margin per farmer and per hectare.

Farm size (ha)	Average size per farmer (ha)	Number of farmer	Average gross revenue per farmer (₦)	Average gross revenue per hectare (₦)
<2.0	1.4	71	63436.63	453111.88
2.1-4.0	3.3	51	154392.3	46785.55
4.1-6.0	5.2	15	206930.9	39794.40
6.1-8.0	8	1	360040	45005
>8.1	10.8	5	480080	44451.85
Total/ Average	5.7	143	824879.83	221348.68

Source: Field Survey 2006

Gross and Net Revenue Analysis of Groundnut Production

Table 2 reveals that 71 farmers who had less than or equal to 2.0 hectares as their size earned ₦63436.63 as average gross revenue per farmer and ₦45311.88 as average gross revenue per hectare. 51 farmers who had their farm sizes in the range of 2.1- 4.0 hectares had average gross revenue of ₦1,154, 392.3 per farmer and average gross revenue of ₦46,785.55 per hectare. 15 farmers who had farm size in the range of 4.1-6.0 hectare while one farmer whose farm size falls within the range of 6.1-8.0 hectare had average gross revenue of ₦360,040 per farmer and ₦45,005 per hectare. The remaining 5 farmers that had 8.1 or more hectares had average gross revenue of ₦480,080 per farmer and aver-

Table 4: Net revenue per farmer and per hectare

<i>Farm Size</i>	<i>Average size per farmer (ha)</i>	<i>Number of farmers</i>	<i>Average total cost per farmer (N)</i>	<i>Average total cost per hectare (N)</i>	<i>Depreciation on fixed assets (fixed cost) (N)</i>	<i>Average net revenue per farmer (N)</i>	<i>Average net revenue per hectare (N)</i>
<2.0	1.4	71	36144.58	25817.56	10075	17217.05	9419.32
2.1-4.0	3.3	51	95097.91	28817.55	9034.58	550259.81	8933.42
4.1-6.0	5.2	15	129851.33	24971.41	11092.6	65986.97	3730.35
6.1-8.0	8	1	224300.48	28037.58	10781.8	124957.72	6185.62
>8.1	10.8	5	28613.65	26167.93	6455	445011.35	11828.92
Total/Average	5.7	143	514007.99	133812.03	47438.98	703432.9	40097.63

Source: Field Survey, 2006

age gross revenue of ₦44,451.85 per hectare.

Table 3 indicates that 71 farmers who operated less than or 2.0 hectares earned an average net revenue of ₦17,217.05.05 per farmer and ₦9,419.32 as average net revenue per hectare. 51 of these farmers who had their farm size in the range of 2.1-4.0 hectares earned average net revenue of ₦500,259.81 per farmer and ₦8933.42 per hectare. 15 farmers who operated between 4.1-6.0 hectares of groundnut farm earned average net revenue of ₦65986.97 per farmer and ₦3730.35 per hectare respectively. The only one respondent whose farm size lies between 6.1-8.0 hectares earned an average net of ₦124957.72 per farmer and ₦6185.62 per hectare respectively while five of these sampled farmers whose farm size is 8.1 hectares or more earned an average net revenue of ₦445011.35 per farm and ₦11828.92 per hectare respectively. This reveals that groundnut production is a viable venture in the study area and hence disproves the hypothesis that groundnut production is not profitable.

CONCLUSION

From the costs and return analysis, it is found that, the total cost of production by farm size per hectare in the area was ₦133, 812.68; the gross

margin per hectare was ₦221348.68, while the average net return per hectare was ₦40, 097.63. The findings also shows that farmers in the area earned an average net revenue ranging between ₦17, 217.00 and ₦445, 011.35 depending on farm size which indicated that groundnut production is a profitable venture in the study area

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