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PRODUCTION ANALYSIS OF GROUNDNUT, *(ARACHIS HYPOGAEA)* IN EZEAGU LOCAL GOVERNMENT AREA OF ENUGU STATE, NIGERIA.

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ABSTRACT

Production analysis of groundnut (*Arachis hypogaea*) was carried out in Ezeagu local government Area of Enugu State. This was done by randomly sampling 105 groundnut farmers from seven autonomous communities in the local government area. The overall aim was to determine, specifically the profitability of groundnut production relative to the resources used. Data collected was analyzed by using descriptive statistics, gross margin and multiple regression. From the result, it was found that 48.6% of the farmers owned between 4 6 hectares while 25.7% had between 1 3 hectares of land. Most of the land owned (43.8%) was by inheritance, with purchasing and hiring constituting 21.9% and 34.3%, respectively. Moreso, the type of labour used was predominantly manual (57.1%) and sourced from mainly (33.3%) family labour. This was relatively augmented with both hired labour (30.5%) and communal labour (23.8%). Generally, most of these farmers employed traditional farm inputs, and family labour. They were also found to source their funds for groundnut production mainly from personal savings (26.7%) while relatives contributed 15.2% including 14.3% from friends. Furthermore, the result of gross margin analysis revealed that N8,466 per hectare was obtained. Even at that, a sizable profit of N6,067 was realised, an indication that groundnut production was a profitable venture in the study area. However, the multiple regression analysis indicated R^2 value of 0.9825. This implied that 98% of the total variation in groundnut yield was explained by the combined influence of all the explanatory variables (farm inputs) in the regression equation. The overall result indicated a strong, positive relationship between some independent variables (inputs) used in groundnut production and the yields obtained as confirmed by F-test (2.250). The study also identified lack of improved capital inputs (80.95%), non availability of fertilizer, lack of collaterals (47.62%), and high interest rate (38.09%) as major problems hindering the production of groundnut in Ezeagu Local Government of Enugu State.

KEY WORDS: Production, Analysis, Groundnut, Ezeagu, Enugu State, Nigeria.

INTRODUCTION

In economics, production is simply defined as an act of creation of goods and services. The goods created could be tangible or intangible. However, the act of creating these goods and services is a relative term representing the channel or technique of achieving the production of final good or service. To start with, this paper briefly considers the processing and utilization of groundnut seeds.

Processing of Groundnut Seeds

Groundnut can be processed into a number of edible products such as groundnut oil, groundnut butter, salted groundnut and a number of confectioneries like peanut candies, brittle, crisps, caramel tops, peanut chews, peanut candy, desserts, bakery sweet (Woodroft, 1983). Groundnut can also be processed to produce groundnut cheese, peanut protein, peanut milk and curd, peanut paste for seasoning vegetable, boiled unshelled fresh peanut and peanut bread (Holadey, 1978).

In Nigeria, groundnut oil is traditionally obtained as follows; groundnuts are shelled and roasted lightly after which the red skins are removed by rubbing individual kernels against each other. The kernels are then pounded with mortar and pestle or ground using grinding stone pestle. The oil rich pestle is kneaded and hand pressed to remove the oil. A small quantity of warm water is usually added after each pressing, with which the mixture is fire dried over a low fire (Asiedu, 1989). Susan (1989) noted that hydraulic and expeller processing of groundnut saves labour and process more groundnuts to oil per time, and also yield cakes with 5% oil and above.

The nuts or seed are passed through various screens and then through shelling machine. Blanching gives a whiter and more homogenous appearance to the nuts. This treatment involves the removal of the seed coat by combination of drying, heating, rubbing between soft surface and blowing an air current through the nut (Martin and Lenard, 1976). Tabah (1981) described a machine for grinding groundnut as making pure peanut butter. The peanuts are delivered from a hopper to grinding disks, one of which is rotated. The ground materials are delivered into removable cup and heat is automatically applied to provide the proper temperature. The appreciated temperature is 160°C for 40 60 minutes. Nath (1974) noted that excessive temperature is detrimental to the nuts as it breaks down the oil, scorches the surface of the nuts and chars the loose skin.

Utilization of Groundnut Seed

In Nigeria, groundnut is consumed in roasted form, and the kernel is used in many home recipes. Several non-food groundnut products can be in the total nitrogenous matter of the groundnut (Seshadri; 1979). At present, confectionery and edible groundnuts are being emphasized in the tropics of West Africa, as the seeds are gradually replacing lunch for most urban dwellers (Uguru, 1996). It contains about 11% carbohydrate, 30% protein, 45% oil, 2% ash and 5% water. After oil extraction, the residues are good sources of protein useful in bakeries and in the manufacture of livestock feeds.

Groundnuts are consumed in larger quantities in the salted form. The term salted peanut refers to those groundnuts that are shelled roasted and salted to taste (Asiedu, 1989). According to Pickett, (1989), roasting imparts a typical flavour resulting from the reaction between amino acids and carbohydrates to produce tetrahydrofuran derivatives. Woodroft (1983), noted that coating of salted groundnut with zein, an alcoholic soluble protein from corn, extends the shelf

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life three to four time beyond that of uncoated peanuts.

Kelkar (1986) described a peanut milk and curd whose nutritive value favourably compared with those of cow or buffalo milk. Furthermore, he prepared a cheese like product from peanut milk which is high in protein with low cost.

On the other hand, non-food uses of groundnut include; peanut hay, meal and hearts which are used for poultry and livestock feeds while the seed coats are commercial sources of tannine and thiamine (Picket, 1989). Salunkhe and Desie (1986) reported that peanut shell can be used as fuel, filler for fertilizer, mulch for growing plants, litter for poultry houses, abrasive for polishing steel and aluminum, and high-grade activated charcoal. Groundnut oil is also used in soap industry (Susan, 1989).

Woodroft (1983) noted that peanut butter is one of the most important products prepared from groundnut in the United States. He further noted that there are three textures of peanut butter, smooth, regular and chunky. Above all, peanut butter could even be eaten as it is or used in a variety of recipes spread on bread and in frosting or icing. The importance of groundnut seed especially in our daily meal cannot be overemphasized. For instance, Nath (1983) also observed that groundnut is a useful source of thiamine, niacin, tocopherol (vitamin E) and folic acid in the human diet.

Basically, the major objective of the work is to analyse the economic and technical aspects of groundnut production and utilization in the study area. It is also expected that major constraints against the efficient production and utilization of groundnut in the area will be ascertained. The result of the study will be very useful to the farmers in decision making while policy makers will also find it relevant.

METHODOLOGY

Study Area

The study area is Ezeagu Local Government Area, which is made up of seven known clans: Owa, Umana, Oghe, Umumba, Obinofia, Awha and Olo. It is bounded in the North by Uzo-Uwani Local Government Area, and South by Oji-River Local Government. On the East, it shares common boundary with Udi Local Government Area and on the West by Awka. It is geographically located between longitude 7° 30' east of the Greenwish meridian and latitude 6° 34' North of the Equator. Ezeagu Local Government Area has a total population of about 887,978 (NPC, 1991).

The area is influenced by two main wind systems: the South West trade winds and North-East winds. These wind systems give rise to two distinct seasons: the rainy season and the dry season respectively. The rainy season begins in March and lasts till October while the dry season begins from November and lasts till February.

According to Iloeje (1981), relative humidity for all the Eastern States of Nigeria fall within the range of 60% to 80%. Temperature averages between 19.73°C and 30°C monthly in the state (ENADEP, Annual Report, 1993). March has the highest temperature range of between 21.9°C and 32.6°C while the month of June has the lowest range of between 19.8°C and 29.7°C.

Generally, the land is plain with the soil type which is dominantly sandy-loam. Obichara (1961) stated that the soil type of the Four Eastern States of Nigeria is deep porous sandy-loamy with the clay content increasing as the depth increases. However, the staple food crops by the people include: cassava, maize, yam, cocoyam and groundnut. Vegetables cultivated include: pepper, okra, melon, tomatoes, pumpkins, telfaira occidentalis (ugu), water leaf *(Talinum triangulare)*. Cash crops include also cashew, oranges, banana, kolanut, plantain, mango and oil-palm.

Notwithstanding, the farming activities in Ezeagu Local Government Area are basically carried out by traditional method with farming implements like cutlass and hoes as major farming tools. The farmers are small holders, operating mainly with family labour (Awoke, 2002). Mixed cropping is the dominantly cropping practice in the area. Moreso, the people of Ezeagu Local Government Area also earn additional incomes from other secondary occupations like fishing, craft, trading and others.

Sampling Procedure

Seven communities out of twenty autonomous communities in Ezeagu Local Government Area were randomly selected for this study. Five villages were chosen from each of these seven autonomous communities, giving a total of thirty five villages. Furthermore, three groundnut producers were also randomly selected from each of the thirty five villages. This rounded out to a total of one hundred and five groundnut small-holder farmers for this study.

Sources of Data

Data for this study was obtained from mainly primary sources. This was done by using a well structured questionnaire augmented with oral interview schedules. The respondents for this study were groundnut farmers whose main occupation was groundnut production. The information obtained from these farmers formed the bulk of the primary data, in addition to the field observation.

Analytical Techniques

The data obtained was analyzed using descriptive and inferential statistics. Thus, percentages, frequencies and means were adopted in order to determine the scale of production, distribution, product uses and constraints. However, gross margin and multiple regression analyses were applied specifically to establish the degree of profitability in production processes, as well as the relationships between the inputs used and the outputs obtained respectively.

On the multiple regression analysis the production function was subjected to regression analysis in three different forms viz: Linear, semi-log and double log. This was necessary in order to compare the results and select the final equation with the best fit in terms of regression coefficients, standard error of estimate (SE), and the level of significance of the parameter estimates.

RESULTS AND DISCUSSION

The result of groundnut production in Ezeagu Local Government Area of Enugu State, Nigeria is discussed under the main headings: scale of production, distribution and product uses, Gross margin analysis, Multiple regression result and constraints militating against groundnut production.

Scale of Production, Distribution and Product Uses

For purpose of clarity in presentation, the result on scale of production, distribution and product uses is discussed under these headings: size and sources of land, type and sources of labour, sources of capital, market and means of transportation available to the groundnut farmers in the study area.

Size of Farm Land

This depends on the number of hectares owned by the individual farmers and the level of groundnut production. From the result, it was discovered that 48.6% of the farmers owned between 4 to 6 hectares, while 25.7% owned between 1 to 3 hectares. However, none of the farmers was found to own more than 9 hectares of land. One of the reasons for this was that the farmers' holdings were relatively small, which implied that a higher percentage of these farmers practised peasant farming.

On the sources of land used, the result further indicated that the main sources include inheritance, hiring and purchasing. Specifically, it was found that the main source of land acquisition for groundnut production was predominantly by inheritance (43.8%), while hiring and purchasing constituted about 34.3% and 21.9% respectively. The implication of this is that sources of land for groundnut production were not only costly but also difficult to come by. This therefore, reduced the number of hectares cultivated by the farmers relatively to the marginal yields.

Types and Sources of Labour Used by the Farmers

The result shows that types of labour used included manual (57.1%) and mechanized labour (43%). However, the result reveals that the most available sources of labour to groundnut farmers included family labour with 33.3% and hired labour, 30.5%. The result further indicates that only 23.8% of the farmers made use of communal labour with no migrant labour in existence. The implication here is that farmers in the study area still operate more at a peasant level with little technical know-how. Above all, the most accessible sources of labour were family and hired labour which were relatively cheap.

Types of Market Available to Groundnut Farmers

Result obtained indicates that most of groundnuts produced were marketed at the farm gate, local and urban markets. It was found that 38.1% of the groundnut produced were marketed at local markets while 33.3% were at urban markets with only 28.6% sold at the farm gate. This tends to imply that more groundnut products were distributed at the local markets. However, it is of note that the means of transporting the produced products to the markets were head (21.9%), bicycle (22.8%) and motocycle ranking highest with 30.5%.

Types of Capital Used by the Farmers

The result based on the capital used by groundnut farmers has shown that 22.9% of groundnut producers used hoes while 19.0% were found to use local planting stocks. Moreso, 16.2% also used machetes. Regretably, none of the farmers used tractors and improved planting stocks. From this result, it can be inferred that groundnut farming in the study area was still at a small-scale level involving traditional method of farming with no mechanization method.

Sources of Capital

The sources of capital were found to include personal savings, friends, local lenders, relatives, banks, government and associations.The result indicates that 26.7% of the farmers obtained their capital from personal savings; 15.2% came from relatives while only 14.3% was from friends. Generally, the result has shown that personal savings formed main source of capital to groundnut farmers.

Costs and Returns of Groundnut Production

Here, the variable inputs were identified relative to the returns per hectare of crop at gross margin (GM). From the result, a total revenue (TR) of N23,518 was obtained per hectare of crop. The variable cost (VC) included cost of seeds, fertilizer, agro-chemical and labour involved in land clearing, cultivation, planting, weeding, fertilizer application and harvesting. It was observed that cost of fertilizer ranked highest constituting 46.2%, which was N6,948.76 per hectare, while the cost of labour, N3,368.7 was 22.4%, of the total variable cost. However, the lowest variable cost came from the cost of hoes with N799.7 at 5.3%.

On the whole, a total variable cost (TVC) of N15,052 was incurred per hectare. Therefore, the subtraction of total variable cost from total revenue (TR) gave a gross margin (GM) of N8,466 per hectare. The result of the fixed cost was N2,399, which also agreed with Upton (1996), that fixed cost expenses in the traditional farming method was minimal.

The result of gross margin analysis further indicated that groundnut production in the study area was profitable with N6,067, notwithstanding, that most lands cultivated were either obtained through inheritance (44%) or hiring 34.3% (Table 1).

TABLE 1: GROSS MARGIN ANALYSIS OF GROUNDNUT PRODUCTION PER HECTARE, 2002.

S/N	Item	Unit	Quantity	Price/Unit-N	Total N	Percentage (%)
1.	Total Revenue(TR)	kg	1567.84	15	23518	
2.	Variable Cost (VC)					
	Labour	Manday	197	17.1	3368.7	22.38
	Fertilizer	kg	151.06	46	6948.76	46.17
	Agro-chemical	kg	268.19	9	2413.71	16.04
	Seeds	kg	169	9	1521	10.10
	Hoes	kg	57	14.03	799.7	5.31
	Total				15051.87	100

Gross Margin Analysis
Total Revenue(TR) = 23518
Total Variable Cost (TVC) = 15052
Gross Margin (GM) = TR TVC
GM = 23518 15052
GM = 8466

Fixed Asset	Total Fixed Cost (N)
Land	N2399

Profit (π) = GM TFC
π = 8466 2399
π = 6067

Source:Field Survey, 2002.

Result of Multiple Regression Analysis

The inputs used in groundnut production were considered relative to the outputs obtained using the multiple regression result. Following the results obtained in the regression of the equation in the linear, semi-log and double log forms, the linear equation result was selected on the basis of the R^2, F-test, and the significance level of the parameter estimates. The estimated linear equation is as follow:

Qt_{GP} = 13624.3 - 1.596X_1 - 0.698X_2 + 0.959X_3 + 0.418X_4 + 0.875X_5

S.E.E	(2945.9)	(1.023)	(0.657)	(0.477)	(1.017)	(0.596)
t - cal	(4.625)	(-.561)	(-1.062)	**(2.013)	(.411)	*(1.469)

R^2 = 0.9825

F-Ratio - 2.153

Durbin Watson - 1.769

*: Significant at 10% level

**: Significant at 5% level

In the regression equation above, the result explains the existing relationship between the quantities of groundnut produced and the inputs used at that period. Thus, the R^2 values (0.9825) showed that the variables in the multiple regression model accounted for about 98% of variation in groundnut yields.

However, the coefficient of land input (X_1) was negatively signed and also statistically insignificant at 5% level. This indicates an inverse relationship between land input (X_1) and groundnut yield. This agreed with the concept of land as a fixed factor of production, with little or no effect on the groundnut production in the study area.

Similarly, the result further revealed that even labour (X_2) whose coefficient also showed negative sign appeared not significant at 5%. The issue relates to groundnut as perennial crop relatively less labour intensive when compared with other crops like yam, cassava and others.

Conversely, the coefficient of fertilizer (X_3) was positively signed and also statistically significant at 5% level. This conformed with a priori expectation of positive coefficient of fertilizer input for higher productivity. Unfortunately, seed (X_4) which although positively related to the yields obtained was found insignificant at 5% level of confidence.

Agro-chemical (X_5) was positively signed, as well statistically significant at 5% level. This tended to signify a positive relationship between agro-chemical input and groundnut output.

Finally, the result of the high standard error (2945.978) was perhaps due to the relatively small sample size of 105 small-scale groundnut farmers who were used for the research because of their being actively involved in groundnut production in Ezeagu Local Government Area of Enugu State. Moreso, the low Durbin-Watson of 1.769 when compared with lower and upper Durbin-Watson values of 1.571 and 1.780 respectively at 5% level of significance where n is 105 and k is 5, also indicated an absence of autocorrelation between the regressors and regressand. Above all, the overall result indicated a strong, positive relationship between some independent variables (inputs), used in groundnut production and the output (yields) obtained in the study area. This was explained by the high result of R^2 (98%) variation, confirmed by F-ratio (2.153).

Constraints Militating Against Groundnut Production

Some of the major constraints militating against groundnut production in Ezeagu local government were identified as subsequently discussed. These include: constraints in distribution of improved capital inputs, formal credit and problems encountered in management.

From the result, it was found that about 80.95% of the groundnut farmers were unable to obtain fertilizer input. This was as a result of lack of capital in form of money. Even at that, fertilizer input was more of a "hot cake" for the few who could afford it. This essential commodity was found to be hoarded and even sold at very exorbitant prices beyond the reach of the small-scale groundnut farmers at Ezeagu Local Government Area of Enugu State.

It was also found that collateral affected the performance of groundnut farmers as indicated by 47.62% of the respondents. As a rule, the farmers were expected to deposit or show some possessions or properties to the Banks before obtaining loans. This posed major problem to the poor farmers who are so impoverished that they have little or nothing to offer as collateral to the banks.

Moreso, the high interest rate charged on borrowed funds was found to have discouraged most of the groundnut farmers.

Finally, the result indicated also that 33.33% of the farmers were faced with the problem of capital in form of farm inputs. Specifically it was found that inadequate input (28.56%) and fluctuations in prices (14.27%) and pest attack (14.28%) constituted serious problems towards increased groundnut production in the study area. Most unfortunately, the problem of transportation cannot be overemphasized, as most of the farmers were unable to evacuate their groundnut produce to the urban cities where the demand was very high. These notwithstanding, the production of groundnut still appeared a major farm activity that needs to be encouraged in Ezeagu Local Government Area.

RECOMMENDATIONS

Production of groundnut in Ezeagu Local Government Area of Enugu State was found to be still in the primitive stage. Thus, the small-scale groundnut farmers are faced with numerous problems including lack of improved capital inputs, formal capital and managerial ability of the available resources. Based on these indicators, some policy recommendations are in order aimed at improving the efficiency and productivity of groundnut in the study area. These include among others:

(i) The need for the formation of cooperative societies of the groundnut farmers. This could help the farmers to adopt modern technology, capable of obtaining and using improved capital inputs.

(ii) The problem of collaterals and high interest rates on loans calls for a reduction in interest rates charged on borrowed funds for increased production.

(iii) More land should be made available to the groundnut farmers through deliberate government policy. This would tend to increase the number of land hecterage farmed by farmers.

(iv) Provision of agro-chemical at subsidized rates would help to reduce pests and disease attack on groundnut at storage.

(v) Fertilizers are essential in increasing productivity and hence, should be subsidized and made available to the farmers as and when due. The menace of hoarding should be minimized so that products could be sold at affordable prices to the farmers. This may help to reduce the ignorance and misconceptions about the use of fertilizers by our groundnut farmers.

(vi) Modern market facilities and transportation should be provided to ease distribution and evacuation of the products to areas of high demand in the state.

Generally, groundnut production in Ezeagu Local Government Area of Enugu State was found to be a profitable venture, though still at a primitive stage but needed to be mechanized for higher productivity and rewards. This is in view of its economic role and contributions to our daily menu and nutrition.

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