

Original Research Article

Small Holder Commercial Groundnut Production and its Effect on Poverty Alleviation in Dass Local Government Area of Bauchi State., Nigeria

ABSTRACT

The paper examined small holder commercial groundnut production and its effect on poverty status of groundnut farmers in Dass Local Government Area of Bauchi State. Data for the study were collected using questionnaire administered to the respondents who were selected using random sampling technique. The data collected were analyzed using commercialization index, Foster Greer and Thorbeck (F.G.T) and Tobit regression model. The result showed that most of the small holder farmers grow their groundnut for commercial purpose ostensibly to raise their income portfolio. From the FGT analysis, the poverty line was constructed to be at per capital monthly expenditure equal (₦7,752.22). The poverty count index (P_0) for the household was 60%. This means that 60% of the farming households in the study area were poor. The Tobit regression result showed that the variable poverty status was negatively significant. This implies that enhancing the farmer's status will probably lead to an increased in commercialization. On the other hand, education, part-time occupation and distance to market were positively significant. It is therefore recommended that to alleviate the poverty status of the farmers, they should be encouraged to promote groundnut farming as a business and not as subsistence venture. In this regard, infrastructural facilities (market stalls and roads) should be provided. Also, an enabling environment for small scale industries that utilized groundnut should be facilitated by the government. This will encourage the farmers to produce more and in return earn more, and consequently improve their socio economic well-being.

Keywords: Small holder, Commercial, Groundnut, Production, Effect, Poverty Alleviation

1. INTRODUCTION

The teeming human population in Nigeria is exerting pressure on the national food and protein requirements over the years, this trend is progressively increasing. Therefore, there are calls for increased domestic food production in order to bridge the gap between aggregate supply and demand [1]. Commercial transformation of subsistence agriculture is an indispensable path way towards economic growth and development for many agriculture dependent developing countries [2].

Sustainable household food security and welfare also require commercial transformation of subsistence agriculture [3]. Commercial production of groundnut is likely to result in welfare gains through the realization of comparative advantages of economics of scale and from dynamic technological, organizational and institutional change effects that arise from the flow of ideas due to exchange based interaction [4]. According to a study by [5] farmers with high degree of market engagements have better potential of enjoying better standard of welfare. Similarly [6] noted that enhancing the degree of commercialization and poverty status of smallholders can have more impact on reducing poverty status than promotion of few large ventures.

Commercialization enhance the links between the input and output side of agricultural markets. It entails markets orientation (agricultural production decision destined for market based on market signals) and market participation (offered for sale and use of purchased inputs) [7]. Empirical evidence indicates that commercialization of small holder farms has the potential to enhance income and welfare outcomes and take smallholder out of poverty if constraining factors such as lack of capital, basic skills (farming and commercialization), high transaction cost, lack of infrastructure, lack of information and lack of education could be eliminated [8].

According to [9], groundnut is grown on 26.4 million hectares worldwide with a total production of 36.1 million metric tonnes. Groundnut production in Nigeria as further expressed by [10] covers an area of about 1.0 to 2.5 million hectares annually and yield in the range of 500 – 300kg/ha. Groundnut served as a considerable income earner for poverty alleviation and one of the most popular commercial crops in Nigeria, for food security and wealth creation. It is pertinent to note that the issue of analysis of small holder commercial production of groundnut is very important to investment decision by rational investors. It is in view of this that the research was carried out to analyse the effect of small holder commercial groundnut production on poverty status of famers in Dass Local Government Area of Bauchi State, Nigeria.

2. METHODOLOGY

2.1 The Study Area

Dass local government area was created in 1976. It is located in the South Western part of Bauchi State and is one of the smallest in size. It is about 58km from the State capital. It has a land mass of 456,731 km²[11]. Dass Local Government Area is located in the Northern Guinea Savannah Zone of Nigeria between latitude 9°45' and 10°15' North and longitude 9°15' and 9°14' East, with a population of about 111,529 in 2014 (projected from 2006 census). From the area view, Dass is surrounded by mountains and deep valleys. In this valley, most of the area located has a gentle mild temperature with annual maximum and minimum temperature of 13-32°C. The area experiences distinct wet and dry season influenced by the south westerly and northeasterly winds. The mean annual rainfall is below 1100mm to 1200mm with duration of 150-60 days. Dass L.G.A is mainly an agricultural areawhere crops such as groundnut, maize, millet, rice, cowpea, soybeans and a wide variety of vegetables are grown.

Comment [O1]: Please project the population upto 2016 and indicate the percentage growth rate per annum. You are as well to cite a reference i.e NPC, 2006

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2.2 Sampling Procedure and Sample Size

Preliminary survey was conducted to identify the farmers in the study area. The sample size for the study was selected using the random sampling technique regardless of their background; this was done so as to remove any element of bias. Out of eleven (11) districts, three (3) were purposively selected for sampling; the districts are Dott, Wandu and Bundott. The choice of these districts was informed by the prevalence of groundnut farmers. In each of the district, (40) respondents were selected, this gave the overall sample size of 120.

2.3 Data Collection

The main source of information was primary data. The data was collected through the administration of questionnaire complemented by interview during the survey period. The questionnaire was design based on the objectives of the study.

2.4 Data Analysis

91 The data analysis was achieved using a combination of descriptive statistic, commercialization
 92 index, Foster, Greer and Thorbeck (FGT), and Tobit Regression.

93 **2.5 Models Specification**

94 **2.5.1 Crop Commercialization Index**

95 The household commercialization index (HCI) to determine household level of
 96 commercialization [12, 13]. The index measures the ratio of the gross value of groundnut sales
 97 by household i in year j to the gross value of total groundnut produced by the same household i
 98 in the same year j expressed as a percentage. The index measures the extent to which
 99 household crop production is oriented towards the market. A value of zero would signify a totally
 100 subsistence oriented household and the closer the index is to 100, the higher the degree of
 101 commercialization. The advantage of this approach is that commercialization is treated as a
 102 continuum thereby avoiding crude distinction between “commercialized” and “non-
 103 commercialized” households. This effectively brings subsistence food production to the center of
 104 discussions about commercialization. The HCI is given as:
 105

$$106 \text{ HCI}_i = \frac{\text{Gross value of groundnut sales by household } i \text{ in year } j}{\text{Gross value of total groundnut produced by the same household } i \text{ in the same year } j} \times \frac{100}{1} \dots (1)$$

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108 **2.5.2 Foster, Greer and Thorbeck (FGT)**

109 The Foster, Greer and Thorbeck [14] weighted poverty index was used to determine the poverty
 110 status of the farmers. The P- alpha (P_α) measures the poverty status or different dimension of
 111 the indices of poverty, (P_0), (P_1) and (P_2) and was used for measuring individual head count,
 112 depth and severity of poverty respectively. The measure was able to accomplish this, through
 113 the weight given by the index to the severity of poverty. There are three measures all based on
 114 the formula but each index puts different weight on the degree in which a household or
 115 individual falls below the poverty line.

116 This measure was useful due to its decomposability among sub group. To define the
 117 consumption or household expenditure, this was arranged in ascending order, from poverty (Y_1),
 118 next poorest (Y_2) with the least poor (Y_q).

119 The poverty index is defined mathematically as follows:

$$120 \quad P_\alpha = \frac{1}{n} \sum_{i=1}^q \left[\frac{(z - y_i)}{z} \right]^\alpha \dots \dots \dots (2)$$

121 Where

122 α = the FGT index and takes values 0, 1 or 2

123 n = total number of households

124 q = number of households below the poverty line

125 Z = poverty line

126 Y_i = the MPAEHE of the household in which individual i^{th} lives

127 Three members of the FGT index are:

128 1. Suppose $\alpha = 0$: This equals the headcount ratio, the index measures no aversion to
 129 poverty:

$$P_0 = \frac{1}{n} \sum_{i=1}^q \left[\frac{(z - y_i)}{z} \right]^0 = \frac{q}{n} H \quad (3)$$

2. Suppose $\alpha = 1$: the P_α is the headcount times the average expenditure shortfall:

$$P_1 = \frac{1}{n} \sum_{i=1}^q \left[\frac{(z - y_i)}{z} \right]^1 = HI \quad (4)$$

Here, P^α = Headcount $\times$ average income shortfall

In other words, it measures the depth of poverty (the proportion of the expenditure shortfall from the poverty line). It is otherwise called the poverty gap between the i^{th} poor farming household and the poverty line

3. The FGT poverty measure for $\alpha \geq 2$, this weighs the poverty of the poorest individual more heavily than those just slightly below the poverty line. Squaring the gap between their expenditure and the poverty line in order to increase its weight in the overall poverty measure does this:

$$P_2 = \frac{1}{n} \sum_{i=1}^q \left[\frac{(z - y_i)}{z} \right]^2 \quad (5)$$

This measure, unlike the first two P_α measures is sensitive to the distribution of expenditure among the poor. Here, the P_α is the weighted sum of individual expenditure shortfalls where income gaps themselves are the weights. Thus, the expenditure gap ratios of poorer households weigh more importantly in the calculation of P_α than the expenditure gap ratios of less poor households.

2.5.3 The Tobit Regression

The Tobit model is expressed following [15]. Tobit decomposition framework examined the effect of changes in the explanatory variables (X_i) on the probability of producing groundnut for commercial or subsistence use. The Tobit Model can be mathematically expressed as:

$$V_i = \begin{cases} V_1 = \beta X_i + \varepsilon_i & \text{if } V_1 > V_1^* \\ 0 = \beta X_i + \varepsilon_i & \text{if } V_1 \leq V_1^* \end{cases} \quad (6)$$

Where:

V_i = the dependent variable, it is discrete when the small holder farmers produce groundnut for commercial purpose and continuous when otherwise.

$i = 1, 2, \dots, N_i$, where N_i is the total number of groundnut farmers.

X_i = vector of explanatory variables

β = vector of unknown parameters

ε_i = independently distributed error term.

The empirical model used for determining factors that influenced the commercialization of groundnut production among small holder farmers in Dass, Bauchi State, Nigeria is specified as:

$$V_1 = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + \varepsilon_i \quad (7)$$

Where:

V_1 = limited dependent variable, it is the commercialization index (an index of 0.50 – 1.00 = groundnut for commercial purpose and 0.01 – 0.49 = groundnut for subsistence purpose)

X_i = the independent variables specified as determinants of commercializing groundnut and defined as follows:

X_1 = Age of the respondents (years)

171 X_2 = Gender
 172 X_3 = Marital status
 173 X_4 = Educational level (years)
 174 X_5 = Household size (number)
 175 X_6 = Farming experience (years)
 176 X_7 = Farm size (ha)
 177 X_8 = Part time occupation
 178 X_9 = Distance to nearest market (km)
 179 X_{10} = Poverty status (1=Non poor, 0=poor)
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181 3. RESULTS AND DISCUSSION

182 3.1 Groundnut Commercialization

183 The result in Table 1 shows the level of commercialization by the respondent in the study area.
 184 The total output obtained by the farmers was 364,400kg while the total output sold by the
 185 farmers was 326,100kg with the total groundnut consumed by the farmers as 38,300kg. This
 186 indicates that the quantity of groundnut sold is greater than the total quantity consumed by the
 187 farmers as shown by their respective ratios. This implies that since the ratio of the groundnut
 188 sold is approaching 1, it indicates a high degree of commercialization [16]

189 **Table 1: Crop Commercialization of the respondents**

Variables	Quantity(kg)	Gross value(N)	Ratio
Groundnut consumed	38300	6,587,600	0.11
Groundnut sold	326100	56,089,200	0.89
Total groundnut produced	364400	62,676,800	1.00

190 Source: field survey 2016

191 3.2 Poverty Status

192 The poverty line used for this study was derived from the monthly maximum and minimum per
 193 capital expenditure (MPCE) of the sampled household shown in Table 2. Two third (N7,752.22)
 194 of the monthly PCE of the sampled household was used as poverty line. The poverty of the
 195 farming households which included poverty head count or incidence (P_0), poverty gap or depth
 196 (P_1) and squared poverty severity (P_2) were analyzed. The (P_0) for the entire households was
 197 60%. This means that 60% of the farming household in the study area was poor. The poverty
 198 gap index (P_1) usually referred to as the depth of an average poor person from the poverty line
 199 was 36%. The poverty incidence (P_2) which measures the distance to each poor person to one
 200 another was found to be 0.12. This means that among the poor households 12% were severely
 201 poor. This shows that the poor households were not equally poor but vary in their degree of
 202 poverty. The average per capital expenditure (PCE) was (N11628.33), while the maximum
 203 (PCE) was found in the study at (N56, 953.33) and the minimum per capital was (N2, 04.63) of
 204 the respondents respectively.

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215 **Table 2: Household poverty profile and indices**

Poverty	Frequency	Percentage
Non-poor	48	40.0
Moderate poor	54	45.0
Core poor	18	15.0
Total		
FGT poverty indices		
Poverty incidence	60.0	
Poverty depth	0.36	
Poverty severity	0.12	
Average PCE	11628.33	
Min PCE	2040.63	
Max PCE	56953.33	
Std. Deviation	11843.8	
Coefficient of variation	1.02	
Poverty line (2/3) =	7752.22	

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217 3.3 Factors Influencing Intensity of Groundnut Commercialization

218 Age of the respondents: The age of the respondents had negative but significant relationship
 219 with commercialization at 1%.This implies that there is a probability that the quantity of
 220 groundnut sold in the market will reduced as the age of the farmer's increases in the study area.

221 Educational status: The coefficient education of the farmers measured was positive and
 222 statistically significant at 1% level. The result implies that education was significant factor in
 223 determining the commercialization of groundnut by farmers in the study area. The coefficient
 224 tells us that an increase in the educational level of the farmers will probably lead to an increased
 225 in the commercialization of groundnut by the farmers. This implies that as farmers education
 226 increase, they tend to increase the quantity of groundnut sold in the market ostensibly because
 227 educated farms tend to take agriculture as a business beyond the subsistence level.

228 Part time Occupation: Part occupation of the respondents was positively significant to groundnut
 229 commercialization at 5%. This implies that as the increase the farmers take up occupations in
 230 addition to farming, their income is increased. This could be channeled into cash crop
 231 (groundnut) production.

232 Distance to market. Distance to market by the respondents was significant and positively related
 233 to commercialization at 1%. This implies that farmers who reside farther from the market
 234 probably farm more and consequently sale most of their groundnut compare to those that reside
 235 closer to the market. Perhaps most of those that reside closer to the urban markets tend to
 236 embrace some other vocations and take to farming as a part time activity just to produce
 237 enough for the family consumption.

238 Poverty status: The coefficient of poverty status was significant at 1% level and had negative
 239 relationship with groundnut commercialization. This implies that the decrease in poverty among
 240 farmers will increase the intensity of groundnut commercialization by the farmers in the study
 241 area. This means that the higher the poverty the lower the quantity of groundnut sold at the
 242 market by the respondents. This is true because poor farmers don't have the resources to
 243 increase their farm acreage and they can't afford inputs that could possibly increase their yields.
 244 All these combine to explain the negative relationship between commercialization and poverty
 245 status of the farmers. It could therefore be deduced that to alleviate the poverty status of the
 246 farmers, they should be encouraged to see groundnut farming as business and not as
 247 subsistence venture.

248 **Table 3: Distribution based on the factors influencing intensity of groundnut**
 249 **commercialization**

Variable	Coefficient	Standard error	t-value
Constant	1.5418	0.8192	1.88
Gender	-0.1433	0.2809	-0.15
Age	-0.1893	0.0190	-9.90***
Marital status	0.1536	0.1528	1.01
Education	0.2009	0.0227	8.08***
Household size	0.0288	0.0505	0.57
Farming experience	-0.0262	0.0267	0.32
Part time occupation	0.0958	0.0443	2.15**
Farm size	-0.0254	0.1380	-0.18
Cooperative participant	0.1479	0.2031	0.73
Distance to market	0.1834	0.1058	3.12***
Poverty status	-0.074	0.039	-2.693***

250 ***significant at 1%, ** significant at 5% log, likelihood = - 175.26524

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251 4. CONCLUSION AND RECOMMENDATIONS

252 The paper examined small holder commercial groundnut production and its effect on poverty
 253 status of groundnut farmers in Dass Local Government Area of Bauchi State. The result
 254 indicates that the quantity of groundnut sold is greater than the total quantity consumed by the
 255 farmers as shown by their respective ratios. The result of the poverty revealed that the (P₀)for
 256 the entire households was 60%. This means that 60% of the farming households in the study
 257 area were poor. The Tobit regression showed that education status, part time occupation and
 258 poverty status positively affected groundnut commercialization in the study area, while age and
 259 poverty status negatively affected commercialization. It is therefore recommended that to
 260 alleviate the poverty status of the farmers, they should be encouraged to consider groundnut
 261 farming as a business and not as subsistence venture. In this regard, infrastructural facilities
 262 (market stalls and roads) should be provided. Also, an enabling environment for small scale
 263 industries that utilized groundnut should be facilitated by the government. This will encourage
 264 the farmers to produce more and in return earn more, and consequently improve their socio
 265 economic well-being.

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268 COMPETING INTERESTS

269 Authors have certified that there is no competing interest whatsoever from anywhere.

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