

EFFECTS OF SOCIO-ECONOMIC CHARACTERISTICS OF FARMERS ON MAIZE PRODUCTION IN CHANCHAGA LOCAL GOVERNMENT AREA OF NIGER STATE

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Abstract

The study examined the effects of the socio economic factors of farmers on maize production in Chanchaga L.G.A of Niger State. Primary data were collected using interview schedule. A total of 100 respondents were randomly selected from five (5) villages and the data collected were analyzed using descriptive and inferential statistics (Multiple Regression). The result revealed that most of the respondents were still young, all of which belong to the male gender with large family sizes but with low literacy levels they were mostly small scale farmers with a large number having less than one hectare of maize farm. The farm size, labour and fertilizer had significant positive effect on maize production but capital inputs had negative significant effect on maize output. The constraints faced by the farmers include; inadequate capital, problem of pest and diseases.

Introduction

Maize (*Zea mays*) is an important food and feed in Nigeria and remains an important crop for rural people. In Nigeria, maize is a staple food of great socio-economic importance. Ironically, the demand for maize as a result of various domestic uses sometimes outstrips supply (Akande 2004). Furthermore, other factors like inadequate capital, price fluctuation, disease and pest, poor storage facilities have been associated with low maize production in the country (Ojo, 2003). Therefore, the production of the crop must be increased in order to ensure food and income security through the development of improved maize varieties and technology. In developing countries, maize has a wide range of uses these include baking, brewing industries and livestock feed. Maize is a high yielding, easy to process, readily digestible and cheaper cereal crop than others. It is a versatile crop growing across a wide range of agro ecological zones. Every part of the plant has an economic value. The leaves, grains, stalk, tassels and cob can all be used to produce large varieties of food and non food products (Oyekale and Idjesa 2006).

Maize is an important source of carbohydrate, protein, iron, vitamin B and minerals. Green maize (fresh on the cob) is eaten parched, baked, roasted or boiled playing an important role in filling the hunger gap after the dry season and serving as a staple diet for over 200 million people (Directorate Agricultural Information Service in cooperation with ARC-Grain Crop Institute, 2003). The importance of maize cannot be over emphasized with Nigeria producing 43% of the maize grown in West Africa. Maize accounts for 43% of calorie intake (National Agricultural Research Project, 1994). An estimated 3,562, 917mt of maize was expected from the state in 2004 (2.2%) over the figure for 2003. This figure was however lower than the expectation of the farmers who were optimistic of a good harvest given the level of availability of inputs especially fertilizer which is the most critical for maize production (National Special Programme on Food Security, 2004). Hence this study tends to find out the effects of socio economic characteristics of maize farmers in maize production. The broad objective of this

paper is to examine the effects of socio-economic characteristics on the output of maize in Chanchaga Local Government Area of Niger State by specifically describing the socio-economic characteristics of the respondents and determine their effects on maize production in the study area.

Methodology

This study was carried out in Chanchaga L.G.A of Niger State. The Local Government is located in Southern Guinea Savannah ecological zone of Nigeria. The respondents were selected using a multi stage random sampling technique. In the first stage, a list of all the villages (9) in the Local Government Area was obtained from the Local Government Headquarters from this frame, a total of five villages were randomly selected. The second stage involved listing all the registered farmers in each village. This was done with the assistance of the village heads and resident extension agent in each of the selected village. From the list, 10% of the total number of registered farmers were selected from each of the five (5) villages giving a total of 100 farmers and they are Gbakota, Kadna, Chanchaga, Nubuti and Lukomphi. Data were collected using interview schedule with the help of trained ADP enumerators being supervised by of the researcher. Data collected included information on socio economic characteristics (age, sex, marital status, years of farming experience). Also, the input, output, farm size, labour, fertilizer, capital and constraints faced by maize farmers. The data collected were analyzed using descriptive statistic and ordinary least square (OLS) multiple regression analysis. It was hypothesised that maize production is influenced by a number of factors. In implicit form, the model is specified as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, e)$$

Where Y = Output of Maize (tones)

X₁ = Farm size (ha)

X₂ = Labour (mandays)

X₃ = Fertilizer input (kg)

X₄ = Capital inputs e.g. Depreciation of tools and equipment (Naira)

X₅ = Cost of material inputs e.g improved seeds, agrochemicals (Naira)

X₆ = Age of farmers (Years)

X₇ = Level of education (Number of years spent in school)

X₈ = Extension contact (Number of meeting with an extension officer)

X₉ = Years of farming experience

e = Error term/stochastic, disturbance term.

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots + b_9 X_9 + e$$

$$\ln Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_9 \ln X_9 + e$$

Exponential

$$\ln Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + \dots + b_9 X_9 + e$$

Semi log:

$$Y = \ln b_0 + b_1 \ln X_1 + b_2 \ln X_2 + \dots + b_9 \ln X_9 + e$$

Variables X₁ - X₉ are as previously defined, b₀ is the constant term, b₁ - b₉ are regression parameters estimated economically, ln is the natural logarithm and e is the error term. Four functional forms namely linear, double-logarithmic, semilog and exponentials were estimated econometrically and the lead equation was chosen on the bases of the relative magnitude of the coefficient of multiple determination (R²) parsimony of the variables as well as the signs magnitudes and significant of the regression parameters, that is the normal econometric, economic and statistical criteria.

Results and Discussion

Data in Table 1 showed that 35% of the respondents were within the range of 31 - 40 years which implies that the farmers are still young and are expected to be more active and productive on the farm than the older counterpart. This is in consonance with Achi, (2002) who reported that farmers within the age of 32 - 40 years were youths who are active in farming and willing to adopt innovation and hence, there is a tendency for farm expansion in the nearest future to meet the demand of the growing population. The Food and Agricultural Organization, FAO (2005) also stated that the

farmers within 31-40 are within the economic productive or active working age bracket. All the respondents sampled were male. This is in consonance with the findings of Olaleye (2000) that small scale farming are being mostly carried out by male, while the women were involved in light farm operations such as processing, harvesting and marketing. Though 79% of the respondents have one form of education or the other, the literacy level is generally low this might affect their ability to adopt improved farm practices for maize production, thus leading to low productivity. According to Obasi (2000), education enhances the farmers' ability to understand and evaluate new production techniques which will translate into higher form of productivity and income. Education is also considered as an important factor in the recognition and utilization of investment opportunities (Islam and choe, 2009, Stampiri and Davis, 2009).

Also, 47% of the respondents have more than six people in their household. . It signifies that most of the respondents have large household sizes. A large household size might provide a good source of labour for maize production, at the same time, might mean more expenditure on meeting the basic needs of the family, and thus, effective investment on maize production

Achi (2002) reported that the higher the family size, the higher the labour force available to produce enough food and cash crop for the family. However, it is not the household per say but the composition of the household (ratio of working group to the dependent group). Land allocated to maize production ranges from 0.1 – 3.0 ha. Most of the respondents are small scale farmers, with 58% of the respondents having less than one hectare of farm land. The respondents derived the capital for farming from friends and personal savings and non indicated that they had access to formal institution. This is in line with the findings of Olayide, Essang and Idachaba (2001) who reported that the majority of the credits used by farmers were sourced from informal sources which include money lenders, friends, relatives, contribution by farmers associations and group etc this may be due to flexibility of the informal sources. Nwaru (2002) reported that loans from non institutional sources are devoid of administrative delay and there is no insistence on collateral security. Maize in the study area was mostly produced under mixed cropping pattern as reported by 60% of the respondents. Mixed copping serves as a security against crop failure as well as additional source of income from the farm. Crop plants cultivated with maize included yam, okra, groundnut and sometimes millet.

Table 1: Socio - Economic characteristics of respondents in the study area

Description	No of Respondents	Percentage(%)
Age		
Less than 20	6	6.0
21-30	15	15.0
31-40	35	35.0
41-50	24	24.0
Sex		
Male	100	100.0
Female	0	0.0
Level of Education		
No Formal Education	21	21.0
Quranic education	36	36.0
Primary education	25	25.0
Secondary education	18	18.0

Household Size		
1-5	43	43.0
6-10	47	47.0
11-15	7	7.0
16-20	3	3.0
Farm Size		
0.1-1.0	58	58.0
1.1-2.0	34	34.0
2.1-3.0	8	8.0
Sources of capital		
Friends\Family	30	30.0
Personal Saving	70	70.0
Cropping pattern		
Sole cropping	40	40
Mixed cropping	60	60
Total	100	100.0

Source: Survey data 2006.

OLS Multiple Regression Estimates of Factors Affecting Maize Production

The result of the multiple regression analysis is presented in Table 2. Semi log is the lead equation chosen and was therefore used for further discussion. It had R^2 value of 0.791. This implies that about 79.1% of the variation in maize output (Y) was explained by the variables ($X_1 - X_9$) included in the model while the remaining 20.9% is as a result of non inclusion of other explanatory variables in the model. The F-ratio is positive and statistically significant at 0.01 levels, indicating that the variables included in the model adequately explained the output of maize in the study area. Out of the 9 variables, only 4 were found to be statistically significant in explaining maize output. The coefficient for farm size (X_1) was 429.618 ($P < 0.01$) and was found to be statistically significant at 1% level. This implies that, there is a positive relationship between farm size and yield of maize; hence, unit increase in land area will significantly lead to increase in production. Large farm size

coupled with good managerial practices will translate into higher outputs (Mekonnen 2015). Labour has a coefficient of 241.932 ($P < 0.01$). This implies that there is a positive relationship between output of maize and labour input in man-days and increase in labour will lead to an increase in maize production. Most farming activities in Nigeria are known to be characterised by the use of family labour (Musa, 2005). The quantity of fertilizer (X_3) is significant at 1%. The coefficient is also positive as expected i.e. 277.815 ($P < 0.01$). The result indicates that fertilizer usage could greatly affect the quantity of maize produced. Therefore, for farmers to increase production and profit, they must increase the quantity of fertilizer used. From the result in Table 2 it was found that capital inputs (X_4) like hoe, cutlass and basket were significant at 1% but with a negative coefficient -449.254 ($P < 0.01$). This is so because in small holder agriculture, investment in capital inputs is generally low.

Table 2: OLS multiple regression estimates of the factors affecting maize production in Chanchaga Local Government Area of Niger State.

Variables	Semi-log	Linear	Double log	Exponential
Constant term	713.832 (0.742)	32.509 (0.268)	6.106 (2.467)	5.3843 (18.380)
Farm size (Ha)(X ₁)	429.618*** (4.697)	278.562*** (4.227)	0.666*** (0.2991)	0.33** (2.92)
Labour(Man-days)(X ₂)	241.932*** (3.002)	1.281*** (4.418)	0.685*** (3.304)	0.003258*** (4.652)
Fertilizer(kg)(X ₃)	277.815*** (0.381)	0.235 (0.641)	0.257 (1.106)	-0.0003838 (-4.33)
Capital inputs(X ₄)	-449.254*** (-2.702)	-0.419 (-0.907)	-0.687 (-1.600)	0.0004706 (-0.421)
Planting Materials (X ₅)	-8.135 (-0.241)	0.0003474 (0.132)	-0.3734 (-0.430)	0.000003251 (0.511)
Age(X ₆)	-49.784 (-0.953)	-0.164 (-0.272)	-0.04356 (-0.324)	0.0004625 (0.316)
Education (X ₇)	-7.897 (-0.372)	-3.864 (-0.633)	-0.05195 (-0.967)	-0.01933 (-1.311)
Extension Contact (X ₈)	-85.3113 (-1.397)	-3.841 (-0.629)	-2.232 (-1.474)	-0.01152 (-0.781)
Farming Experience(X ₉)	4.419 (0.098)	-0.579 (-0.287)	-0.06978 (-0.603)	-0.04547 (-0.940)
R ²	0.791	0.769	0.620	0.605
R ² adjusted	0.766	0.745	0.574	0.566
F-statistics	31.210***	33.203***	13.430***	15.326***

Source: computed from survey data, 2006

Note: *** = significant at 1%

** = significant at 5%

* = significant at 10%

Figures in parentheses are the respective t-ratios.

Constraints faced by maize farmers

The preponderance of inadequate capital suggest that small holder farmers finance their agricultural production from their small holdings should necessitate the introduction of more agricultural lending institution with less bureaucratic processes. The problem of pest and diseases ranked second however, knowledge gain from science which deals with plant and animal can enable man combat such

agents of destruction. Furthermore, inadequacy of storage facilities make most farmers sell their produce at low prices immediately after harvest in order to prevent spoilage there by leading to poor prices for agricultural produce. Other constraints include inadequate extension services, poor transportation facilities, pilfering (theft), poor prices for agricultural products and inadequate rainfall.

Table 3: Constraints faced by respondents in the study area.

Constrains faced by Respondents	No of Respondents	Remark
Inadequate capital	48	1
Pets and diseases	32	2
Inadequate storage facilities	26	3
Inadequate extension services	20	4
Poor transportation facilities	20	4
Pilfering(theft)	18	5
Poor prices for agricultural products	16	6
Inadequate rainfall	14	7
Total	194*	

Source: field data, 2006

Note: *Multiple responses were recorded

Conclusion

The study examined the effects of the socio-economic characteristics of the respondents on maize production. Most of the farmers are still young; all of them belong to the male gender but with low levels of education. They are mostly small scale farmers with a large proportion having less than one hectare of maize farm. Most of the have lager house hold sizes. The regression result shows that farm size, labour and fertilizer had significant positive effects on maize output, while capital inputs had negative significant effect on output. The major constraints faced by the respondents in maize in the study area includes inadequate capital, pests and diseases, inadequate storage facilities, inadequate extension services and poor transportation services.

Government, Agricultural agencies and private organisations should establish adult education classes in order to educate the farmers. Also, government and private institutions should help reduce the bureaucracy involved in securing loan in other to encourage small scale farmers access credit in formal financial institutions. Finally, women should be encouraged to take part in maize farming.

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