ECONOMICS OF SUGARCANE PRODUCTION IN NIGER STATE,NIGERIA

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ABSTRACT

The study analyse the economies of sugarcane production in Niger state. Primarily data was randomly collected from 60 respondents in Katcha Local Government area of the state by the use of structured questionnaires. Descriptive statistics, Farm Budgeting technique and multiple regression analysis were used to analyze the data. The descriptive result revealed that majority of the farmers were between ages 36-45 which are mostly men and are married. The cost and return analysis showed an average total production cost of N59,436.81 and an average net income of N261,365.38. Results from the multiple regression analysis shows the value of coefficient of determination (R^2) indicated that 50% of the variation of profit of sugarcane production was explained by the regression model and the result further shows that years of experience (3.314) is significant at 1% level of probability, cost of fertilizer (-1.905) is significant at 10% level of probability and extension contacts (2.254) is also significant at 5% level of probability. The study recommend that quite a number of substantial proportion of land should be devoted to this crop and extension education will be needed to beef up the awareness level of the farmers.

INTRODUCTION

Sugarcane is a grass grown primarily grown for its sugar (sucrose) content. The Nigerian sugar industry is largely under developed in spite of its untapped resources and potentials. According to Bichi (2008), over 500,000 hectares of land suitable for sugarcane cultivation exist in about 40 different locations across the nation which is capable of producing 30 million tones of sugarcane or about 3 million tones of refined sugar. The estimated land under sugarcane cultivation is 23-30,000ha. large scale cultivation is done at Bacita in Kwara State and Numan in Adamawa State with an estimated annual output of 96,000t (misari *et al*., 1998). The Nigerian sugar industry remains underdeveloped and the Government of Nigeria (GON) through the National Sugar Development Council (NSDC) intends to foster sugar production. Since domestic demand is unmet, sugar is largely imported. Raw sugar was the 2nd agricultural import in Nigeria in terms of quantity (after wheat) and the 3rd in terms of value (after wheat and palm oil) for the period 2005-2010 (FAOSTAT, 2012). In 2010, Nigeria was the 2nd largest producer of sugar cane in West Africa after Ivory Coast and the 19th in Africa (FAOSTAT, 2012). In terms of yields, Nigeria is one of the least productive countries in the continent. In 2010, Nigeria's annual consumption of sugar accounted for 50% of the West African consumption (USDA, 2010) owing the large amount of inhabitant in the country. Despite this, the consumption per capita of refined sugar has been low (25 g/capita/day) compared to the average consumption in all Africa (41g/capita/day) and with the average in West Africa (31g/capita/day) (FAOSTAT, 2012). Furthermore, rising agricultural productivity has been the most important concomitant of successful industrialization (world bank, 1992). Sugarcane production is one of the economic activities of the farmers in Niger State, this is because the climatic and soils condition in the area and also the availability of land favours the production of the crop throughout the year.

Objective Of The Study

The broad objective of the study is to analyze sugarcane production in the study area, the specific objectives are;

i. to describe the socio-economic characteristics
ii. to determine the profitability of sugarcane production in the study area.
iii. to determine the factors influencing profitability.

METHODOLOGY

Study area

The study was conducted in Niger State which is situated in North Central Geo-political zone of Nigeria. The location of the state is between longitudes 3^0 30' and 7^0 20' East of the Greenwich Meridian and latitude 8^0 20' and 11^0 30' North of the equator,the state shares border with Zamfara state (North), Kebbi state (North East), Kogi state (South),Kwara (South West), Kaduna (North East) and the Federal Capital Territory (South East). The 2006 population census shows that the state has a population of 3,950,249 with an annual growth rate of 3.4%, and a projected population of 4,756,099 people by 2012. The major tribe of the state are Nupe, Kwari and Hausa. Niger State is one of the largest States in Nigeria covering about 86,000km^2 (or about 8.6 million hectares) representing about 9.3% of the total land area of the country (Niger State, 2008) and about 95% of the land is arable. Niger state

with these tremendous potentials has agriculture as the singularly most important sector of the state's economy, not only as a source of food supply, but also as a source of income and employment for the predominantly rural population.

Sampling Technique And Data Analysis

Random sampling technique was used for this study,60 sugarcane farmers were randomly selected in Badeggi district of Katcha Local Government Area of Niger state. Data was collected by the use of well structured questionnaire, data collected was analyzed using descriptive statistic such as (frequency tables, percentages, average), Net Farm income (NFI) and multiple regression analysis.

Net Farm Income (NFI) which is expressed as

NFI=TR-TC ----------eqn(1)

where;

NFI= net farm income (N/ha)

TR= total revenue (N/ha)

TC= (TVC+TFC)----------eqn(2)

Where ;

TC= Total cost (N/ha)

TVC = Total variable cost (N/ha)

TFC= Total fixed cost (N/ha)

The depreciation on fixed assets was determined using a straight line depreciation method.

Multiple regression analysis was used to analyze the factors affecting profitability of sugarcane in the study area (objective 3). The variables hypothesized to influence the profit in sugar production in this study include: land, fertilizer, Agro-chemical, labour.

The implicit form of the multiple regression analysis of factors influencing the profit of sugar can therefore be expressed as:

$Y = f(X_1+X_2+X_3+X_4+X_5+X_6+X_7+X_8+X_9+X_{10}+\mu)$

Where:

Y= profit (NFI)

X_1= farm size (ha)

X_2= price sugarcane (N/kg)

X_3= cost of labour (N/manday

X_4= cost of household labour (N/manday)

X_5= cost of agro-chemical (N/L)

X_6= Transportation cost (N)

X_7= farming experience (years)

X_8= cost of fertilizer (N/kg)

X_9= number of extension contact

X_{10}= cost of stem (N)

μ = error term

Four functional forms (linear, semi-log, exponential and double-log) were tried. However, the lead equation (i.e equation of best fit) was selected. The selection of the lead equation was based on; The explanatory power of the model (R^2) ,significance of estimated coefficient, magnitude of estimated coefficient, conformity of signs of estimated coefficient with a priori expectation, and significance of the f-ratio.

RESULTS AND DISCUSSION

Table 1: Socio economic Characteristics of Respondents

Characteristics	Frequency	Percentage
Gender		
Male	51	85
Female	9	15
Age group		
30-35	3	5.0
36-43	43	75.0
40-33	9	15.0
36 & above	3	5.0
Marital status		
Single	1	1.7
Married	47	78.3
Divorced	7	11.7
Widow(er)	5	8.3
Education level		
Primary	32	53.3
Secondary	15	25.0
Post secondary	9	15.0
Others	4	6.7
Household size		
1-5	33	55.0
6-10	27	45.0
Farm size (ha)		
<1	25	41.7
1-4	28	46.7
5-8	7	11.7
Total	60	100

Source: Field Survey 2013

Table 1 revealed that majority of the respondent are male (80%), between the age range of 36-45 (75%) and 78.3% are married with household size of between 1-5 (55%) and 6-10 (45), majority of the respondent (53.3%) have only primary education. The table further revealed that majority of the respondents are small scale farmers with farm size of <1 (41.7%) and between 1-4(46.7).

Table 2: Budgetary Analysis

Cost items	cost (N/ha)	% of total cost
Variable cost		
Stem	12467.92	20.98
Hired labour	14489.87	24.38
Household labour	8250.62	0.14
Cost of fertilizer	10541.04	17.73
Cost of Agrochemical	3480.17	5.86
Transportation cost	2720.90	4.58
Total variable cost (TVC)	**51950.52**	**87.40**
Depreciated cost on fixed items	7486.29	12.59
Total cost (TVC + TFC)	**59436.81**	**100.00**
Gross income (GI)	320802.19	
Gross margin (GI – TVC)	268851.67	
Net farm income (GM-TFC)	261365.37	
Returns on naira invested	5.39	
Operating Ratio	0.16	
Gross Ratio	0.18	

Source: Field Survey 2013

The cost and returns table shows that the total variable cost constitute the highest cost percentage of the total cost (87.10%) while the cost of hired labour (24.38%) stem (20.98%) are the highest variable cost items. The GM is ₦ 268,851.67 per hectare of land cultivated, while the NFI is ₦ 261,365.37 and the returns on every naira invested is ₦ 5.36, this implies that sugarcane production is profitable in the area, this is in line with the studies Girei and Giroh (2012) and Daniel (2014) separately that also shows sugarcane production is profitable in their respective study areas.

Table 3: result of regression analysis

Variables	Regression coefficient	T-value
Constant	0.003	3.401***
Farm size (X1	0.367	.921
Price (X2)	0.182	1.380
Labour (X3)	0.827	-.221
Household labour (X4)	0.711	.376
Agrochemical (X5)	0.481	-.716
Transportation (X6)	0.349	-.957
Experience (X7)	0.003	3.314***
Fertilizer (X8)	0.070	-1.905*
Extension (X9)	0.034	2.254**
Stem (X10)	0.549	.608
R^2	0.501	
F-ratio	2.211	

Source: Field Survey 2013

*** = significant at 1% level of probability, ** = significant at 5% level of probability

* = significant at 10% level of probability

The result of the regression analysis in table 4.3 which is showing the relationship between profit and factors affecting it, show the lead equations is the double log out of the three functional forms ran (Linear, semi-log and double log). The result further shows that years of experience (t-value 3.314) is significant at 1% level of probability, which implies that an increase in years of experience will lead to an improve and increase in production, cost of fertilizer (t-value -1.905) is significant at 10% level of probability and extension contacts (t-value 2.254) is significant at 5% level of probability, which implies that an increase in extension contacts or activities will lead to availability of more reliable information which in return enhance production. The value of coefficient of determination (R^2) indicated that 50% of the variation of profit of sugarcane production was explained by the regression model.

CONCLUSION

The study revealed that the respondents in the area are small scaled middle age farmers with mainly primary education. It also revealed that sugarcane production is profitable in the area with positive GM-₦268,851.67 per hectare of land cultivated of and return on investment of ₦ 5.36, it further revealed that years of experience, cost of fertilizer and extension contacts have significant contribution to the profit made in sugarcane production. The study recommends increase in the acreage of land use for sugarcane production.

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