Journal of Plant & Agriculture Research

www.advancejournals.org
Open Access Scientific Publisher

Research Article

ECONOMIC ANALYSIS OF SMALL SCALE RICE PRODUCTION IN GASSOL LOCAL GOVERNMENT AREA OF TARABA STATE, NIGERIA.

E. A. Zubairu[1], P. Samuel[1], D. Florence[1]
[1]Department of Agricultural Economics and Extension, Taraba State University, Jalingo, Nigeria

Correspondence should be addressed to **E. A. Zubairu**

Received June 16, 2018; Accepted September 07, 2018; Published November 20, 2018;

Cite This Article: Zubairu, E.(2018). Economic analysis of small scale rice production in Gassol local government area of Taraba State, Nigeria.. Journal of Plant & Agriculture Research, 3(1), 1-5

ABSTRACT

The study analyzed the economic of rice production in Gassol local Government area of Taraba State. Data were collected using structured questionnaires administered to 140 respondents' selected using multi-stage random sampling technique. The analytical tools employed were descriptive statistics and inferential statistics. The finding revealed that, majority (70%) of the respondents were male and married. Most (55%) of them were in their prime age and 62% had farming as a primary occupation. The gross margin per hectare of land was ₦72, 914.1655 implying that rice production is profitable in the study. Multiple regressions result revealed that, the Linear function gave the best fit, and was selected as the lead equation; farm size (X_2), Seeds (X_3), Hire labour (X_6), agro-chemicals (X_5) and Farming experience (X_8) contributed significantly to rice farmers' output in the study area. High cost of inputs, lack of contact with extension agents, poor storage facilities and high cost of transportation were the major production challenges. The study recommended among others; the creation of opportunities for enhanced farmers' accessibility to inputs and as well extension agents should be giving incentive so that they can education farmers' using different mass media communication strategies.

KEY WORDS : Rice production, Profitability, Taraba State.

INTRODUCTION

Rice (Oryza Spp) is the staple food for about half of human race and ranked third after wheat and maize in terms of worldwide production (Chidda et al., 2006). Rice cultivation is widespread throughout Nigeria with most of the rice grown in the Eastern and Middle belts of the country (WARDA, 1996). Nigeria is one of the countries in the world that has the potentials to produce rice in a large quantity. This is a fact because Nigeria has an estimated 4.6 million hectare of land that is suitable for rice production (Danbaba et al., 2013) and, interestingly too, a study by Ajah and Nmadu (2012) on farmers access to farm inputs indicated that land was one of the most accessible farm inputs. But despite all these potentials, only about 1.8 million hectare, representing 39% is under rice production. Rice production in Nigeria is also dominated by smallholder farmers using traditional methods fraught with drudgery and individual farmer cultivate between 0.5-2 hectares on average (Ndaghu, et al., 2009). But rice production later rose gradually over the years with area expansion to surpass major rice producing countries like Cote d'Ivoire and Sierra Leone (FAO, 2008). [4]

Ohaka et al., (2013) are of the view that before the advent of crude oil, Nigeria produced almost enough rice for local consumption. However, with the discovery of petroleum in the 70's, its production declined steadily over the years in relation to consumption with the result that lately, rice importation takes away huge sums of money from country's hard earned foreign exchange. It is therefore worthy of note that there exists a demand-supply gap due to increase consumption rate of rice (Onu et al., 2015). In 2002, Nigeria accounted for nearly 44 percent of the total rice output and 57 percent of the total rice producing area in West Africa (FAOSTAT, 2011). Paradoxically, Nigeria is also the largest importer of rice in the world. The annual demand of rice in

the country is estimated at 5million tons, while production level is 3 million tons of milled rice resulting in a deficit of 2million tons. Over the years the country has resorted to imports to bridge this deficit. The rice import bill for Nigeria, which was N123.61 million in 1980 (Okorji and Onwuka, 1994), rose to N9.72 billion in the year 2000 (FOS, 2000).

Despite the economic importance of ricee to the teeming populace in Nigeria, it has not been produced adequately to meet food and industrial needs of the country. The set-back is mainly due to the fact that the production of both food and cash crops is still in the hands of smallholder farmers using traditional methods and personal savings (Ohaka et al., 2013). Similarly, it is worthy of note that previous governments embarked on policy interventions on rice production but little has been done in the area of return to scale of rice production. This, coupled with the fact that these small scale farmers can hardly estimate the profitability of rice production in the area. This is the gap this study seeks to fill. The broad objective of the study was to evaluate the profitability of rice production in Gassol Local Government Area of Taraba state while the specific objectives were to describe the socio-economic characteristics of rice farmers, to estimate cost and returns, determine the Input-Output relationship in rice production and to identify the production constraints of rice production in the area.

METHODOLOGY

The Study Area: The study was conducted in Gassol local government area of Taraba state. The study area is situated in the northern part of the state and it has a total land area of about 5,548 km^2 with an estimated population of about 244,749. The study area is located between latitude $8^0$28' and $9^0$10' of the equator and between longitude $10^0$232 and $11^0$30 east of the Greenwich meridian. The local government is bordered to the east by Ardo-kola, Ibi to the west, Bali to the north and Bali local government area to the south. The temperature of the area ranges from 28^0 to 35^0 with annual rainfall of between 800mm to 1,525mm (Oruonye and Bashir 2011). Most of the inhabitants in the area are: Jukun-kona, Mumuye, and Fulani. These ethnic groups are predominantly agriculturally inclined. Most of the agricultural activities found in the area include crops and livestock production such as maize, beans, rice, cowpea cattle, goat and poultry production.

Multi-stage random sampling technique was used to select respondents for the study. The first stage involved the purposive selection of six wards (Gassol, Sabon gida, mutum biyu A, Nyonyo, Tutare and mutum biyu B.) out of the twelve wards in Gassol based on their prominence in rice production. The second stage involved the random selection of one village in each of the selected wards. This gave a total of six villages sampled, from the six villages selected a total of 120 rice farmers were randomly selected in proportionate to the size of the villages as used by Adebayo (2005). S = p/P. Q/1 (1). Where S = Sample size; p = Population of each location; P = Total population; Q = Total number of respondents

METHOD OF DATA ANALYSIS

Descriptive statistics which involves the use of frequencies, percentages and means were used to describe the socio-economic characteristics of the respondents and it was also used to explain the identified challenges experienced by the rice farmers in production while Gross margin analysis was used in determining the cost and returns associated to rice production in the area. Multiple regression models were used to examine the influence of production inputs on rice output in the study area. Four functional forms of regression namely; linear function, exponential function, semi-logarithm function and double logarithm function were tried.

Gross margin analysis

Gross margin can be defined as the difference between the gross farm income and the total variable cost. The gross farm income is the total physical product multiplied by the unit price of the product

GM=TVO-TVC

Where:

GM= Gross Margin (N/ha)

TVO= Total Value of Output (N/ha)

TVC= Total Variable Cost (N/ha

Net income = gm-tfc

Where:

GM= as described above

TFC=Total fixed cost

The production function

The production function analysis was implored to determine the effects and sizes of factors affecting rice production in the area. It is merely a technical relationship between input and output in a production process (Koutsoyiannis, 1979). The implicit form of the relationship is given by:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8 \ldots\ldots. \mu)$

Where=

Y= Output of rice in kg

F = functional relationship

X_1=Age of farmer (in years)

X_2= Farm size (in hectares)

X_3 = Quantity of rice seed (in kg)

X_4= Fertilizer applied (in kg)

X_5 = Agro-chemical applied (in litres)

X_6 = Cost of hire labour (in₦/ha)

X_7 = family Labour input (in man days)

X_8 = Farming experience (in years)

μ = error term.

RESULTS AND DISCUSSION

Socio- economic characteristics of the farmers: The results of the Socio-economic characteristics of the respondents are presented in Table 1. The result indicates that 70% of the respondents were male, while 30% are females. The result indicates that males who are more capable of coping with the drudgery associated with rice farming dominated the study area. Age distribution of the respondents shows that majority (46%) fall within the age of 20-40. This means the respondent are still very active to engage in agricultural production that will contribute toward household food security as in Maurice (2012). Marital status of the respondents indicates that 71% were married with 72% literacy attainment at various level of education. Farming is the major occupation of the respondents representing 58%. 55% had the highest farming experience of 11-20 years with about 87% of the respondents having farm size of 1-5 hectares. This implies that most of the rice farmers' studied were small scale farmers. The result further shows that about 48% of the respondents have household size of 1-5

person. This indicates that farmers had enough family labour for rice production.

INPUT-OUTPUT RELATIONSHIP IN RICE PRODUCTION

The multiple regression analysis was carried out to determine the relationship between the dependent variable (Y) and independent variable (X_i) used in production. Four functional forms namely; Linear function, Double logarithm function, Semi-logarithm function and Exponential function were tried in order to determine the one with the best fit using econometrics, statistic and economic criteria. The Linear function gave the best fit and was selected as the lead equation, this can be observed from their t-values.

The lead equation therefore showed that variable X_3, X_5 and X_8 (seeds, Hired labour and farming experience) had positive coefficient and was also significant at 5% level of significance while the coefficient of farm size (X_2) and Agro-chemicals (X_5) were statistically significant at 5% level of significant. The variables included in the model have explained 34% variation in the dependent variable (output) as revealed by the coefficient of multiple determination R^2. Similarly, the coefficient of seed is positive and statistically significant at 5% level implying that a 1% increase in the quantity of seeds used in planting would increase output of rice by 0.2%. By implication, access to seed certified is expected to translate into a more than proportionate increase in the output of rice per hectare. The coefficient of hired labour is positive and statistically significant at 1% level, implying that a 1% increase in the mandays of hired labour would increase output of rice by 0.70 %. This also meant that increase in labour will also bring about increase in output of rice in the area. However, family labour contributed negatively to rice output. This implies that a 1% increase in the mandays of family labour will decrease rice output by 0.02%. The coefficient of farming experience is also positive and significant at 5% level implying that 1% increase in years of farmer experience would increase output of rice. Agrochemicals (X_5) had a positive and significant coefficient at 5% level of significance. This implies that increase in chemicals will lead to increase in production. The coefficient of farm size is positive and statistically significant at 1% level, implying that a 1% increase in the area devoted to rice production would bring about increase in rice output by 0.24%. This suggests that land is a significant factor associated with changes in rice output and this corroborates the finding of Maurice(2012)

Constraints to Rice Production in the Study Area

The distributions of the respondents based on constraints faced by rice farmers in the study area are presented in Table 3. The result reveals that the most severe problems affecting rice crop farmers are poor access to credit facilities (19.12%), High cost of agrochemicals (18.24%) and Inadequate and high cost of fertilizer (17.65%) where these are ranked 1st, 2nd and 3rd respectively according to severity. The finding indicates that all the respondents were faced with one problem or the other. Other problems faced by the respondents include high cost of labour, drought/flood and pest and diseases. This is partly responsible for the small size of farm lands cultivated by the farmers (Adebayo, 2012).

Table :1 Socio-Economic Characteristics of the Respondents.

Characteristics	Frequency n=140	Percentage (%)
Age (yrs.):		
20-29	11	8
30-39	45	32
40-49	49	35
50-59	30	21
60-69	5	4
Gender:		
male	88	63
female	52	37
Marital Status:		
single	11	8
married	110	69
divorced	9	6
widow	10	7
Households Size:		
1-5	67	48
6-10	56	40
11-15	12	8
16-20	5	4
Educational Level:		
No formal Education	45	32
Primary Education	42	30
Secondary Education	27	19
Tertiary Education	26	19
Farm Size:		
≤1	15	11
1-5	118	84
6-10	7	5

Source: Field survey, 2017.

Table : 2 Gross margin analysis for average rice farmers.

Items	Value/hectare (N)
Rice seed	1,478.74
Fertilizer cost	7,500
Agrochemical	7,190.80
Land clearing	4,034.48
Hired labour	9,113.39
Planting	4068.73
Weeding	3285.2
Fertilizer application	1380.06
Storage	500
Implement	1,078.16
Harvest cost	2888.33
Transportation cost	1,780.81
Total variable cost (TVC)	44,299.21
Total Revenue (TR)	117,213.38
Gross Margin	72,914.17

Source: Field survey, 2017.

Table : 3 Constraints Associated with Rice Production faced in alleviating food insecurity.

Constraints	Frequency	Percentage (%)	Ranking
Poor access to credit facilities	130	19.12	1
High cost of agrochemicals	124	18.24	2
high cost of fertilizer	120	17.65	3
Inadequate extension visit	61	8.97	4
Shortage of labour	60	8.82	5
Poor storage Facilities	55	8.09	6
High cost of labour	50	7.35	7
Drought/ flooding	40	5.88	8
pest and diseases	40	5.88	8
Total	680**	100	
Source: Field survey, 2017.			
** Multiple response			

CONCLUSION

Based on the findings of the study, most of the rice farmers had one form of formal education or another, they had limited contact with extension agents. Rice production in the study area is mostly undertaken by the male gender that are in their prime age. They cultivated an average farm size of about 2 hectares only a few of them had access to bank loan for rice production. The finding also shows that rice production is profitable in the study area with a gross margin of ₦72, 914.1655. Multiple regressions revealed that, the Linear function gave the best fit, and was selected as the lead equation; farm size (X_2), Seeds (X_3), Hire labour (X_6), agro-chemicals (X_5) and Farming experience (X_8) contributed significantly to rice farmers' output in the study area. High cost of inputs, poor storage facilities, high cost of transportation and limited knowledge of rice production were respondents' major production challenges.

RECOMMENDATIONS

Based on the finding the research wish to recommend the following :

I. Rice farmers in the study area should be thought how to use production inputs efficiently; this could be done by fashioning out rice production extension packages targeted at the rice farmers. Packaging of such extension messages should be done using a combination of communication strategies like radio or television programme schedule and agricultural extension bulletin among other methods since most of the rice farmers have some level of formal education.

II. Incentives in the form of access to credit and subsidizing farm inputs as well as other labour saving tools such as power tiller tractors hiring should be made available to the rice farmers in order to alleviate their production constraints and enhance food security.

REFERENCES

[1]. Adebayo, O. O. (2012). Effects of Family Size on Household Food Security in Osun State,Nigeria. Asian Journal of Agriculture and Rural Development. 2(2) 136-141.

[2]. Anon., (2004). Rice: a success story for some. CTA Spore 115**,** 4-5.

[3]. Chidda, S., Prem, S and Ragbir, S. (2006). Modern Technique of Raising FieldCrops**.** Oxford and IBH Publisher. pp 56-57

[4]. Food and Agricultural Organization (FAO), (2000).Agriculture towards 2015/30 TechnicalInterim Report. April, 2000. Rome

[5]. Food and Agricultural Organization (FAO), (2008) Agriculture towards 2015/30Technical Interim report, Rome
[6]. Food and Agricultural Organization (FAOSTAT.) (2011) Crop database Rome Italy (Last updated October 2010)
[7]. Federal Office of Statistics (FOS), (2000) Annual Abstracts of Statistics. Lagos,Nigeria.
[8]. FMA (2001). Federal Ministry of Agriculture, Annual Review, Abuja, Nigeria
[9]. Koutsoyannis, A. (1977). Theory of econometrics (2nd edition). London:Macmillan
[10]. Maurice, D.C. (2012) Optimal Production and Resource Allocation in Food CropProduction in Adamawa State, Nigeria. Unpublished PhD thesisDepartment of Agricultural Economics. Modibbo Adama University of Technology Yola.
[11]. National Population Commission: census (2006)
[12]. Ndaghu A.A, Maurice, D.C. and Zubairu, E. A. (2009): Adoption of the NewRice for Africa (NERICA) Variety among Small-Scale farmers in Taraba State, Nigeria. Nigerian Journal of Tropical Agriculture.**11**: 259-263.
[13]. Odoemenem1, I.U and Inakwu, J.A (21011) Economic analysis of rice productionin Cross River State, Nigeria. Journal of Development and AgriculturaEconomics Vol. 3(9), pp. 469-474
[14]. Okorji, E.C. & Onwuka, K.O. 1994, A Comparative Analysis of Costs andReturns of Non-irrigated and Irrigated Rice Production Systems in Uzo-Uwani Local Government Area of Enugu State, Nigeria. Journal of the West African Farming Systems Research Network 4(2), 12-19.
[15]. Oruonye, E.D and Bashir, A (2011). The Geography of Taraba State, Nigeria:Nature's Gift to the Nation
[16]. Ohaka, C. C., Adiaha, M. M. and Amanze, P. C. (2013) Economic Analysis ofSmallholder Rice Production In Ihitte-Uboma Local Government Area ofImo State. Nigerian Journal of Agriculture, Food and Environment.9(2):37-41
[17]. Raufu, M.O (2014) Cost And Return Analysis Of Rice Production In KwaraState, Nigeria Under Sawah Technology. Adv. Agric. Biol.1 (2), 2014: 79-83
[18]. Singh, M.O. and Mowa, Y.A (1997). Rice Growing Environments andBiophysical Constraints in Different Agroecological Zones of Nigeria.Met, I, 2(1): 35- 44. Lambert Academic Publishing.
[19]. Ajah, J. and J.N. Nmadu, 2012. Socio-economic factors influencing the output of small-scale maize farmers in Abuja, Nigeria. Kasetsart J. (Soc. Sci.), 33: 333-341.
[20]. Danbaba, N., J.C. Anounye, A.S. Gana and M.E. Abo, 2013. Grain physiochemical and milling qualities of rice (Oryza sativa L.) cultivated in Southeast, Nigeria. J. Applied Agric. Res., 5: 61-71.
[21]. Onu, D.O., Obike, K.C., Ebe, F.E. and Okpara, B.O. (2015) Empirical assessment of the trend in rice production and imports in Nigeria (1980 – 2013). International Research Journal of Agricultural Science and Soil Science (ISSN: Vol. 5(6) pp. 150-158.