academicresearchJournals

Vol. 2(4), pp. 63-66, August 2014
DOI: 10.14662/ARJASR2014.021
ISSN: 2360-7874©2014 Academic Research Journals
http://www.academicresearchjournals.org/ARJASR/Index.htm

Academic Research Journal of Agricultural Science and Research

Full Length Research

Assessment of Farm Inputs Utilization and Profitability of Rice Farms in Nasarawa State of Nigeria

Oyewole, S. O., Akintola, A. L. and Ayanrinde, F. A.

[1]Savanna Forestry Research Station, Forestry Research Institute of Nigeria, Samaru-Zaria. *Corresponding author's email: shola4delord@yahoo.com
[2]Ladoke Akintola University of Technology, Ogbomoso, Oyo State, Nigeria.

Accepted 6 August 2014

This study examined the economic efficiency of rice farms in Nasarawa State. Data were obtained from 150 rice farmers with the aid of structured questionnaire. Stochastic frontier cost function was used in analysing the data. From the results, the gamma estimates showed that 95%, 99%, 96%, and 99% variation in total cost of rice production for Nasarawa south, north, west and all zones respectively were due to cost inefficiency in the model. The major variables influencing total cost of rice production in Nasarawa State were the cost of farm size, seed, labour, agro-chemicals and rice output. The results also showed that the average economic efficiency were 42, 35, 59, and 37 respectively. It was revealed that Nasarawa west had the best economic efficiency. The determinants of cost inefficiency were education, household size and extension contact. The study recommends that production of rice in Nasarawa State should involve an integrated and policy approach that will promotes education among rice farmers. This is because education was found as significant variable influencing cost efficiency of rice farm in Nasarawa State. It can be achieved for example through the introduction of adult literacy programmes.

Keywords: Farm inputs, Profitability, Rice Farm, Nasarawa State

INTRODUCTION

Rising demand for rice has been attributed to increased population growth, coupled with increased income as a result of the discovery of crude oil (Akanji, 1995). The rate of rice production in Nigeria has not increased sufficiently to meet the increased demand despite the various policy measures put in place to facilitate production. Thus, the inability of the Nigeria rice sector to match the domestic demand have raise a number of important questions both in policy circle and among researchers (Okuruwa *et al*., 2009). The major constraint to domestic production of rice in Nigeria is connected to poor resource productivity. This could have been the reason between supply-demand gap of rice. Production in agriculture does not only depend on the resources utilization only but the combinations of different inputs have a great contribution in total productivity. The gaps that exist in the production level among farmers could be associated with differences in the combination of factors of production resulting in variation in yield.

The input-output process of farm production is important in at least four major problem areas. These are the distribution of income, the allocation of resources, the relation between stocks and flows, and the measurement of efficiency or productivity (Olayide and Heady, 1982). In

the productivity concept, a meaningful assessment will depend upon a clear and precise definition of input and output in such a way that their movements over time are not equal.

It is therefore, important to investigate the inputs used among the farmers and examine the returns in rice production among rice farmers in the study area. Also, assessment of the input use in rice production is important since major problem in the country rice cultivation still revolves around low productivity which is the implication for poor yield. If resources are properly used, it will result to additional increase in output from existing hectares of rice cultivated. This study examined inputs and output level among rice farmers in Nasarawa State. Also, assess the profitability of rice production in the study area

MATERIALS AND METHODS

The study area was conducted in Nasarawa State, Nigeria. The area is located in the North central zone of Nigeria. It lies between latitude 7^0 N and 9^0 N and between longitude 7^0 E and 10^0 E. The State covers an area of 27,117km^2 with an estimated population of 1,863, 275 people (NPC, 2006). The State has a climate typical of the tropical zone because of its location. It has a mean temperature range from 25^0C in October to about 36^0C in March while rainfall varies from 13.73mm in some places to 145mm in others. Agricultural sector forms the base of the overall development thrust of the state with farming as the main occupation of the people in the area. The state has three agricultural zones which are the Southern zone, Central zone and the Western zone (NADP, 2006). The major crops grown include maize, yam, rice, sesame, sorghum, millet and cowpea. Other crops produced in the area include groundnut, cassava, melon, sweet potato, okra and tree crops such as mango, cashew and shear butter (NADP, 2006).

Multi-stage sampling technique was used for the study. The first stage involved random selection of three Local Government Areas from each zone. The Local Government selected were: Obi, Awe and Doma from southern zone, Toto, Kokona and Karu from western zone and Nasarawa –Eggon, Akwanga and Wamba from Northern zone. In the second stage, two villages were randomly selected from each of the LGAs giving a total of eighteen (18) villages. The third stage involved random selection of fifty (50) rice farm households from each of the three senatorial zones which cut across the selected villages giving a total of one hundred and fifty (150) rice farmers for the study. Multiple regression and gross margin analysis were employed in the analysis of data. The Cobb-Douglas production function used for this study is specified below:

$$Y = a X_1^{b1} X_2^{b2} X_3^{b3} X_4 b^4 X_5^{b5} U$$

This is made linear as:

$$\text{Log } Y = a + b_i \log X_i + b_2 \log X_2 + b_3 \log X_3 + b_4 \log x_4 + b_5 \log x_5 + U$$

Where:

Y = Output of rice (kg)

a = constant

X_1 = Farm size (ha)

X_2 = Seeds (kg)

X_3 = Labour (man- days)

X_4 = Fertilizer (kg)

X_5 = Agro-chemicals (litre)

$b_1 – b_5$= regression coefficients

U = Error term

U = Error term

$b_1 – b_5$ = regression coefficients and elasticities of production of factors X_1 to X_5, respectively.

U = Error term

Gross margin is the difference between the gross farm income (GI) and the total variable cost (TVC), that is, GM = GFI – TVC

Where:

GM = Gross Margin (Naira/hectare).

GFI = Gross Farm Income (N/ha)

TVC = Total Variable Cost (N/ha)

RESULTS AND DISCUSSION

Inputs Output Relationship of Rice Farms the Study Area

The results of Cobb-Douglas production function, presented in Table 1, showed that the coefficient of multiple determination (R^2) was 0.63, indicating that 63% of the total variation in output of rice production was attributed to the explanatory variables included in the production function model. The coefficient for farm size (0.501) was positive and significant at 1 percent, implying that increase in farm size would lead to an increase in output of rice. The estimated coefficient of labour (0.209) was positive and significant at 5% level. This implies that increase in the use of labour would increase farm output in the study area. Also, fertilizer had a positive coefficient (0.065) and was significant at 1 per cent. This implies that increase in the use of fertilizer would lead to increase in output of rice. The production function estimate of agrochemicals (0.128) was positive and statistically significant at 1 percent. This implies that an increase in the use of agrochemicals will increase output of rice. The findings of this study were consistent with studies conducted by Sani *et al*. (2010) who found that the coefficients of farm size, fertilizer and agro-chemical to be positive and significant.

Elasticity of Production

The results presented in Table 2 showed the elasticities

Table 1. Estimated Regression Coefficients, Standard Errors and t-values for rice farms in the study area

Variable	Coefficient	Standard Error	t-ratio
Intercept	4.517	0.534	8.46***
Farm size (ha) (X_1)	0.501	0.115	4.36***
Seed (kg) (X_2)	0.112	0.072	1.55
Labour (man-day) (X_3)	0.209	0.995	2.10**
Fertilizer(kg) (X_4)	0.065	0.027	2.37**
Agro-chemical(litre) (X_5)	0.488	0.084	5.82***

R^2 = 0.63 F-value = 24.86*** ***=Significance at 1% **= Significance at 5%

Table 2. Elasticity of Production and Return to Scale (RTS) for sorghum farmers

Variable	Production elasticities
Land (ha)	0.501
Seed	0.112
Labour (man-day)	0.209
Fertilizer(kg)	0.065
Agro-chemicals (litre)	0.488
Return to Scale	1.375

Table 3. Estimated costs and returns per hectare for rice production in Nasarawa State

Items per hectare	Nasarawa South	Nasarawa North	Nasarawa West	All Zones
Seed cost (₦)	6212	6274.4	6368	6368
Labour cost (₦)	205890	172890	202750	193820
Fertilizer cost (₦)	9769.6	5284.8	4905.6	6653.6
Chemical	8336	3120	7024	6152
Total variable cost (₦)	230207.6	187569.2	221047.6	212993.6
Yield (kg) (₦)	4918	2777	5683	4459
Price (₦ /kg)	90	90	90	90
Revenue (₦)	442620	249930	511470	401310
Gross margin (₦)	212,412.40	62,360.80	290,422.40	188,316.40

of production of the input variables for rice production in the study area. The sum of the partial elasticities of the inputs is 1.375 and a value greater than unity implies increasing returns to scale. This means that output increases more than proportionately with increase in inputs. This indicates that an increase in all the inputs in the models by one unit will result to an increase in the output of rice by greater amount of 1.375 units. This suggests that farmers in the study area are still within stage one of production process and opportunities still exist to increase output level by increasing the use of inputs

Costs and returns of rice farms in Nasarawa State

The results in Table 3 showed the costs and returns of rice production in Nasarawa State. The total cost of variable inputs (seed, land, labour, fertilizer and chemical) were estimated to be ₦230207.60,

₦187569.20, ₦221047.60 and ₦212993.60 for Nasarawa south, north, west and combination of all zones respectively. The values of output/ha were estimated to be ₦442620.00, ₦249930.00, ₦511470.00 and ₦401310 for Nasarawa south, north, west and combination of all zones respectively, while gross margins per hectare were ₦212412.40, ₦62360.80, ₦290422.00 and ₦188316.40 for Nasarawa south, north, west and combination of all zones respectively. The results showed that Nasarawa west had highest gross margin while the least value was recorded for Nasarawa north. It was revealed that the cost of labour accounted for about 90% of the total cost of production for all the areas. This implied that the cost item that drastically reduces the profit of rice production in Nasarawa state is the labour cost. Therefore, rice production in Nasarawa state is labour intensive.

REFERENCES

Akanji BO (1995). Price analysis of the demand for grain crops in Nigeria. The case of rice and cowpea. Unpublished Ph.D. Thesis University of Ibadan, Ibadan, Nigeria.

NADP (2006), Nasarawa State Crop Production Figures. Nasarawa State Development Programme information manual.

Olayide SO, Heady EO (1982). *Introduction to Agricultural Production Economics*. University Press, University of Ibadan, Nigeria.

Sani A, Yakubu AA, Bello HM (2010). Resource-Use Efficiency in Rice Production Under Small Scale Irrigation in Bunkure Local Government Area of Kano State, *Nigerian Journal of Basic and Applied Science*, 18(2): 292-296.