

## PROFITABILITY OF SMALL SCALE RICE PRODUCTION IN BAUCHI LOCAL GOVERNMENT AREA OF BAUCHI STATE, NIGERIA

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### ABSTRACT

*The study examines the profitability among small scaled rice farmers in Bauchi Local Government Area of Bauchi State. A pre-tested questionnaire was administered to 50 rice farmers selected at random. The data were analyzed using descriptive and inferential statistics such as Farm budgeting and Cobb-Douglas production model. The results indicated that farm size, labour and fertilizers were the major determinants of rice production in the study area. The farm budget analysis revealed a return on every naira invested of N0.79. Subsidizing inputs and provision of credit facilities should be the point of policy intervention.*

**KEYWORDS:** Farm, Credit, Cobb - Douglas, Profitability

### INTRODUCTION

Rice is the only major crop that is consumed almost exclusively by human beings. The crop is planted on about 145 millions hectares (11% of world's cultivated land) Rahman *et al* (1998). It plays a major role in the Nigerian economy. It is a convenient food mostly for urban dwellers (Filani, 1980). The significance of the crop lies in its cash value (Okoroji and Obiechina, 1985; Okereke, 1991). In Nigeria, the projected demand for and production of the crop in 2009 was 9.45 and 9.24 million metric tones respectively. The deficit of 0.21 million metric tones could be narrowed if production of the crop assumes 9.93% growth rate as opposed to the prevailing growth rate of 6.11% (FMAWRRD, 1992). This study examines the effect of contemporary socio-economic variables (cost of and returns on inputs, farm size and labour) on rice production and its profitability among farmers in Bauchi Local Government Area of Bauchi state, Nigeria with a view to sensitizing the farmers in promoting this important staple crop.

### METHODOLOGY

Bauchi Local Government Area lies in the Northern Guinea Savannah ecological zone. It is located on latitude 10 17'N and longitude 90 49'N. It has 20 villages comprising 1,625 hamlets scattered across a landmass of 3,540Kms with a

population of 551,060 (NPC, 2006). Farming is the major occupation of the inhabitants. It is estimated that the study area has about 8, 784 members of farm families and produced about 5,999 metric tones of rice during the 2002/03 cropping season (BSADP, 2005).

Ten villages were randomly selected from the study area using table of random numbers. Five (5) rice producing farmers were selected at random from the list of rice farmers from each village, giving a sample size of 50 farmers in all. The selected villages were Bayara, Yelwa, Dan-Dango, Miri, Lushi, Sabon-Kwara, Towin (Inkil), Durun (Bubi), Durun Gabi and Bauchi Urban.

A structured and well pre-tested questionnaire was used for primary data collection. The data collected included socio-economic information, and cost and return information.

### STATISTICAL ANALYSIS

Both descriptive statistics and regression analysis were used in the analysis of data. Farm budgeting and Cobb-Douglas production model having proved the best were adopted for the computation of Net Farm Income (NFI) and estimation of factors affecting output of rice vis-à-vis profit respectively.

Total Net Farm Income (NFI)

$$\text{NFI} = \sum_{i=1}^n \text{TGI} (\text{₦}) - \text{TVC} (\text{₦}) - \text{TFC} (\text{₦}) \text{-----(i)}$$

NFI per household:

$$\text{NFI} (n)^{-1} = \sum_{i=1}^n \text{TGI} (n)^{-1} - \text{TVC} (n)^{-1} - \text{TFC} (n)^{-1} \text{-----(ii)}$$

Where:

TGI = Total Gross Income (₦), TVC = Total Variable Cost (₦)  
 TFC = Total Fixed Cost (₦), Σ = Summation Sign  
 n = Sample Size

The implicit Cobb-Douglas model is in the form:

$$\text{Log } Y = \text{log } a + b_1 \text{ log } X_1 + b_2 \text{ log } X_2 + b_3 \text{ log } X_3 + b_4 \text{ log } X_4 + U \text{ -----(iii)}$$

Where:

- Y = Output of rice (kg)
- X<sub>1</sub> = Farm Size (ha)
- X<sub>2</sub> = Quantity of seed (no.)
- X<sub>3</sub> = Fertilizer (kg)
- X<sub>4</sub> = Labour
- U = Error term

b<sub>1</sub>-b<sub>4</sub> are the coefficients

## RESULTS AND DISCUSSION

Table 1 shows the cost and return in rice production.

Total cost of production per ha was N9, 148.03. Variable cost (N7, 806.12) accounted for 85.33% of total cost (N9, 148.03). Among the variable cost, labour accounted for 27.17% (N2, 485.33).

**Table 1: Costs and Returns in Rice Production**

Items of Cost (Inputs)	Cost (₦ /ha.)	% of Total Cost
<b>Variable Costs (VC):</b>		
Labour	2,485.33	27.17
Seeds	836.16	9.14
Fertilizer	2,238.06	24.46
Chemicals	1,116.67	12.21
Transport	1,129.90	12.35
Total Variable Cost (TVC)	7,806.12	85.33
<b>Fixed Costs (FC):</b>		
Annual depreciation value of farm implements	701.41	7.67
Land (Rental Value)	640.50	7.00
Total Fixed Cost (TFC)	1,341.91	14.67
<b>Total Cost (TC)</b>	<b>9,148.03</b>	
Gross Income (GI)	16,347.00	
Net Farm Income (NFI)	7,198.97	
Return on Every Naira Invested	0.79	

Source: Field data

The finding of this study sharply contrast with the findings of Rahman *et al.* (1998) who reported labour cost as 68% of the total cost. The least cost was realized in respect of seeds (N836.16), representing 9.14% of the total variable cost. The relatively high labour cost may not be unconnected with the labour intensive nature of the crop (Stanlake and Grant, 1995). On the other hand, fixed cost was relatively low

(less than 15% of total cost). This is explained by the low investment in fixed assets in rice production. The average gross income (GI) for the respondents were 16,347.

Majority of the respondents (64%) had their NFI per hectare within the range of between ₦ 1,000 to ₦ 5,000 while only 4% of them reported theirs within ₦ 15,000 to ₦ 20,000.

**Table 2: Net Farm Income (NFI) of the Respondents (₦ /ha.)**

Net Farm Income (₦)	Frequency	Percentage (%)
1,000 - 5,000	32	64.00
5,001 - 10,000	6	12.00
10,001 - 15,000	3	6.00
15,001 - 20,000	2	4.00
20,001 - 25,000	3	6.00
>25,000 -	4	8.00
<b>Total</b>	<b>50</b>	<b>100.00</b>
Mean = ₦ 7, 198.97 per ha, X ± SD = ₦ 7, 198.97 ± 26,320.00		

The average NFI was N7, 198.97 while return on every Naira invested was 0.79. Majority of the respondents (74%) operate at profit while 26% of

them reported losses. This lends credence to the assertion that rice production is a profitable business (Rahaman, *et al.*, 1998).

**Table 3: Results of Estimated Cobb-Douglas production function for Rice in Bauchi LGA**

Determinants	Regression Coefficient	t-values	Probability
Farm size (X <sub>1</sub> )	-257.17	-3.84	p>0.001
Quantity Of Seeds(X <sub>2</sub> )	0.93	0.58	NS
Fertilizer (X <sub>3</sub> )	6.90	4.20	P<0.001
Labour (X <sub>4</sub> )	0.03	3.75	P<0.001
Constant	358.50	2.95	P<0.001

R<sup>2</sup> = 0.70  
 F-Ratio = 26.20  
 NS = Not Significant  
 P<0.001 = Significant at 0.01 level

The R-square value shows that about 70% of the variation in income was explained by the explanatory variables included in the model. The F- Ratio measures the joint significance of all the determinants and was found to be significant (P>0.001), with the coefficients of elasticity of 6.9 and 0.03 for fertilizer and labour respectively, meaning that a 1% increase in both factors (fertilizer and Labour) will increase income of farmers by 6.9% and 0.03% respectively. The coefficient of seeds (0.58) was positive but not significant (P<0.001). This infers that a unit increase in income of farmers will increase fertilizer and labour by 6.9% and 0.03% respectively. The coefficient of seeds (0.58) was positive but not significant (P<0.001). This infers that a unit increase in seeds increase output by 0.58kg.

### CONCLUSION

It can logically be concluded that rice production is a profitable business in the study area. A return on every N invested of N0.78 was realized. Labour intensiveness of the crop accounted for high variable cost (85% of the total cost), with labour cost representing 27.17% of the total variable cost. The full potential of rice farming can be exploited in the study area if a technology that is technically feasible and economically viable is introduced to the farmers to supplement the manual labour requirement. Researchers, extension agencies, policy makers, input suppliers, processors, agricultural produce marketers, and other stakeholders should consider the findings of this study as the basis for assisting farmers to participate the more in the production of this important crop for self economic reliance, poverty reduction and better socio-economic status.

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