



**ECONOMICS OF RICE PRODUCTION IN SELECTED LGAs OF BAUCHI STATE,  
NIGERIA**

**<sup>1</sup>Zongoma, B., <sup>\*1</sup>Gaya, H. I. M., <sup>2</sup>Hassan, B. K. and <sup>1</sup>Bala, H.**

<sup>1</sup>University of Maiduguri, Department of Agricultural Economics, Borno State, Nigeria.

<sup>2</sup>Federal University, Gashua, Department of Agricultural Economics and Extension,  
Yobe State, Nigeria

\*Corresponding Authors' Email: [hyeladibrahim@gmail.com](mailto:hyeladibrahim@gmail.com)

GSM: +2348132224441

**ABSTRACT**

The study examined the economics of rice production in Selected LGAs of Bauchi State, Nigeria. A multi-stage sampling technique was used to select 92 rice farmers for the study. Data were collected with the aid of well-structured questionnaires and analyzed using descriptive statistics and farm budgeting model. The study revealed that most of the rice farmers were in their active ages with a mean age of 40 years. The result also revealed that majority (91.3%) of the respondents were male. The channels which rice flows in the study area was shown with a value chain map and revealed the different channels of the rice flow in the study. Result of the budgeting model reveal the total cost, net farm income and returns per naira invested as ₦254, 907, ₦235,603 and 0.92 kobo respectively. Rice production was found to be profitable in the study area. The study however revealed that the major constraints to rice production in the study area where high cost of fertilizer, insufficient capital and cost of labour. The study therefore, recommended among others, Provision of necessary inputs (fertilizer, agro-chemicals, and improved seeds among others) and easy accessibility of loans to farmers.

**Keywords:** Economics, Production, Rice, Selected and State

**INTRODUCTION**

Rice, *Oryza sativa* is one of the most important food depended upon by over 50% of the world population for about 80% of their food need (Udemezue, 2014). Globally, about 700 million tonnes of rice is produced yearly in over a hundred countries on approximately 158 million hectares of land (World Agricultural Production (WAP, 2020). Africa in particular, accounts for 23.1% of rice global imports in 2019 (Daniel, 2021). The continent produces an average of 24 million tonnes of paddy rice annually (Kamer, 2021). Nigeria ranks highest as both the producer and consumer of rice in the West African sub-region. It is grown on approximately 4.4 million hectares of land in the country, with an annual production of 8.3 million tonnes (Federal Ministry of Agriculture and Rural Development (FMARD, 2021). United States Department of Agriculture (USDA, 2021) reports that Nigeria imports about 2.3 million tonnes of rice as at 2021. This importation is due to deficit in production which is caused by domestic demand exceeding supply, it is necessary to bridge the gap. As the growing demand for rice in the country is forecasted to reach 21.8 million tonnes by 2030 (Famulusi and Chizoba, 2021).

In Bauchi state, rice is one of the most common crops being cultivated after maize. FMARD in collaboration with National Agricultural Extension and Research Liaison Service (NEARLS), (2021) revealed that the state produces about 232,000 tonnes of rice on 146,020 hectares of land. Despite that, it is generally observed that there is low level of investments even with such potential. This is apparent by the high number of small-scale rice farmers whom are mostly resource poor especially in the area of production. Greater improvement in rice production in the state can be achieved with a proper analysis that will lead to knowledge of the performance of rice production. This study therefore aimed at undertaking such analysis by ascertaining the economics of rice production in Selected LGAs of Bauchi state. The main objective of the study was to determine the



economics of rice production in selected local government areas of Bauchi state, Nigeria while the specific objectives were to identify the socio-economic characteristics of rice producers in the study area; describe the structure and channels of rice production in the study area; determine the cost and returns of rice production in the study area and identify the constraints associated with rice production in the study area

**MATERIALS AND METHODS**

**The Study Area**

The study was conducted in Bauchi State, Nigeria. Bauchi State is located in the North-eastern region of Nigeria and it occupies a total land area of 49,119km<sup>2</sup> representing about 5.3% of Nigeria’s total land mass. It is located between latitudes 9° 30 and 12° 30 N and longitudes 8° 50 and 11 50 East. The state has a projected population of 7,652,402 as of 2021 based on annual growth rate of 3.2% (National Population Commission, 2006). The state has two distinctive vegetation zones, namely the Sudan and the Sahel Savannah. The Sudan savannah covers the southern parts of the state which consists of grasses which gets richer southwards. The mean annual temperature is 24°C and average rainfall of 700mm-1300mm (Bauchistate.gov.ng, 2020). The major economic activities in the state are farming and livestock rearing. Its vast fertile soil is an added advantage for producing Agricultural products such as rice, maize millet, groundnut and guinea corn.

**Sampling Technique**

A Multistage sampling technique was used for the selection of 92 respondents for this study. At stage one three Local Government Areas (LGA) were purposively selected based on the intensity of rice production in the area. These LGA’s were Dass, Toro and Itas-gadau. In the second stage, one community was purposively selected (high rice producing community) from each of the three LGAs. In the third stage, a sampling frame of rice farmers was obtained from the BSADP, were a simple random technique was used to proportionately select 20% of the farmers as respondents making a sample size of 92 respondents for the study.

**Method of Data Collection**

Data were collected using structured questionnaire administered to the respondents through personal contact.

**Method of Data Analysis**

Data for this study were analysed using descriptive statistics and inferential statistics.

**Farm budgeting Techniques**

The simple budgeting technique (Net Farm Income) was used to achieve objective iii. which is to determine the cost and return of the rice production in the study area. This technique was used by Inuwa *et al.* (2011) and Abah *et al.* (2015) Net Farm Income according is expressed as follows;

$$\sum_{i=1}^n NFI_i = \sum_{i=1}^n GI_i - \sum_{i=1}^n TC_i \quad \dots(1)$$

Where;

NFI = Net Farm Income (₦); GI = Gross Income (₦); TC = Total Cost (₦) and I= Rice farmers

**Operating Ratio<sup>1</sup>**

The operating ratio reveals the proportion of the gross income that goes to pay for the operating cost. In normal farm setting, the operating ratio is more significant than fixed ratio in that most of the resources utilized are variables, while fixed items are mostly negligible. It’s a planning tool use for determining profitability of a farm business (Olukosi and Ogungbile, 2005). The operating ratio formula employed for this study is;

$$\text{Operating Ratio (OR).} = \frac{\text{Total Variable cost(TVC)}}{\text{Total Revenue (TR)}} \quad \dots(2)$$



## RESULTS AND DISCUSSIONS

### Socio-economic characteristics of Rice farmers

The age distribution of the farmers was presented in Table 1. The result show that mean age of rice farmers in the study area was 40 years. This indicates an active age range that can easily handle all the mental and physical activities required for rice production. This is in line with the finding of Ohen and Ajah (2015) who reported a mean age of 35 years among rice farmers with some level of formal education and concluded they are in their active age and will be more receptive of information and quick to utilize and adopt improved rice production practices. The result also show that majorly (91.30%) of rice farmers were male. The results of the findings also show that majority (75%) of the rice farmers were married with a mean of household size of 8 persons. This implies that the bigger the household size, the less cost of hired labour during production. The mean year of farming experience was 15 years. Which implies that famers had experience in rice farming. Igboji *et al.* (2015) also reported that the average years of farming experience of most rice farmers in Ebonyi state is between 16-20 years. The result also indicates that 56.5% of the rice farmers were registered members of one association while 43.5% do not belong to any association.

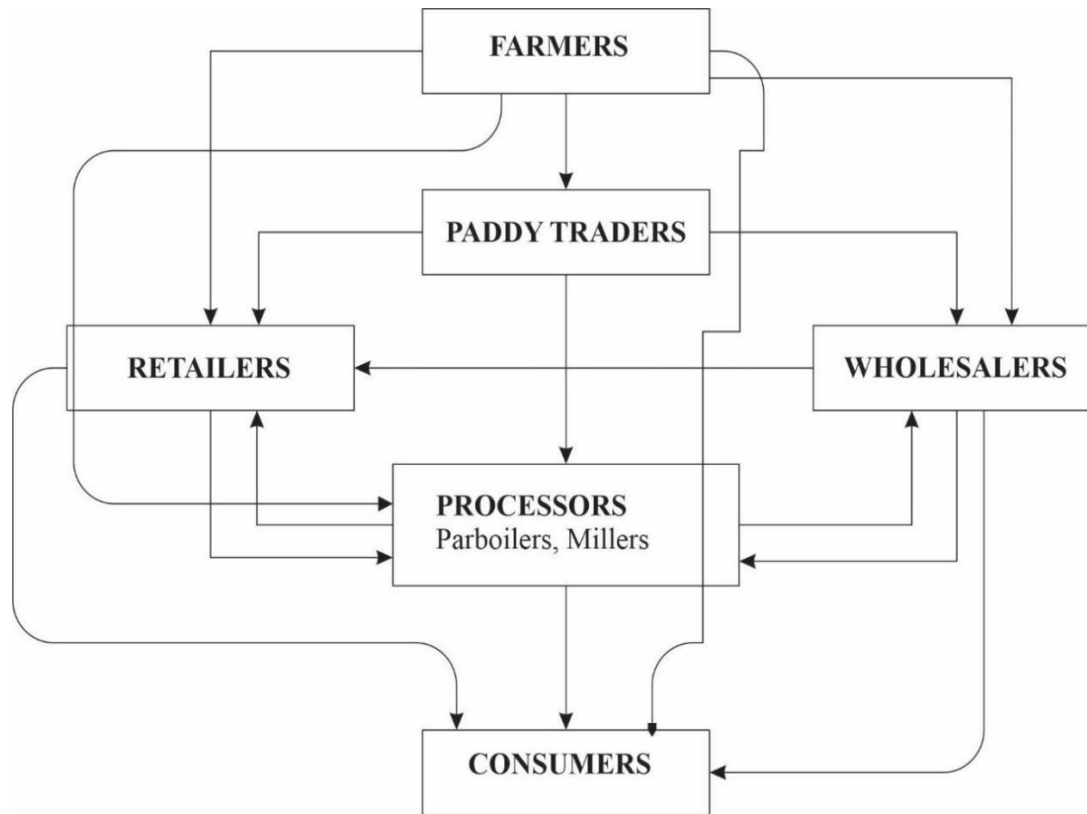
**Table 1: Distribution of respondent according to socio-economic characteristics (n=92)**

Variables	Frequency	Percentage	Mean
<b>Age</b>			
21- 30	24	26.08	40
31-50	53	57.60	
51-60	9	9.78	
61-70	4	4.34	
71-80	2	2.17	
<b>Sex</b>			
Male	84	91.30	
Female	8	8.70	
<b>Marital status</b>			
Married	69	75	
Otherwise	23	25	
<b>Household size</b>			
1-5	26	28.26	8
6-10	40	43.47	
11-15	19	20.65	
16-20	4	4.34	
21-25	3	3.26	
<b>Educational status</b>			
No formal education	6	6.52	
Primary education	17	18.47	
Secondary education	51	55.43	
Tertiary education	18	19.56	
<b>Years of farming Experience</b>			
1-10	31	33.70	15
11-20	52	56.52	
21-30	6	6.52	
31-40	3	3.26	
<b>Membership of cooperative</b>			
Member	52	56.52	
Non-member	40	43.47	

Source: Field Survey, 2022

### The Structure and Channels of Rice Production

The value chain map or flow chart is a tool use for the identification of important participants and also the flow of rice from production up to consumption. The participants involved are arranged in such a way that facilitates movement of rice from production to consumption. The flow of rice in the study area is shown in Figure 1 below.



**Figure 1:** Structure of Rice Production in the Study Area.

**Source:** Field survey, 2022

Channel I: Farmers → Paddy traders → Processors → Wholesalers → Retailers → Consumers

Channel II: Farmers → Paddy traders → Millers → Wholesalers → Retailers → Consumers

Channel III: Farmers → Wholesalers → Retailers → Consumers

Channel IV: Farmers → Processors (Parboilers, Millers) → Consumers

Channel V: Farmers → Consumers

The results from Figure 1 indicates that the major participants in the rice value production structure are the rice farmers, paddy traders, processors, wholesalers, retailers and the consumers. The first channel showed movement of rice from farmers to paddy traders then to processors who then pass it to wholesalers after processing. Wholesalers then sell to retailers who then pass it to consumers. The second channel deals with un-parboiled milled rice. It flows from farmers to paddy traders followed by millers, then wholesalers to retailers and finally to consumers. The third channel starts from the farmers to wholesalers then retailers who transform it and sell to consumers. On the fourth channel rice moves from farmers to the processors, but paddy rice here is owned by the farmer which then gets sold to the consumers after processing. On the fifth channel paddy rice flows from farmers to the consumers, which some of them store and only process it when required. Although middlemen play important role that links these value chain participants along the chain, they only coordinate and do not own the product. These together create a chain that helps in ensuring self-



sufficiency in rice production and consumption in the study area. The findings agree with Amolegbe and Adewumi (2016) who reported similar channel of rice flow from farmers to final consumers in Nasarawa state.

### Cost and Returns of Rice Production in Selected LGAs of Bauchi State

The profitability of rice production was determined using the net farm income analysis which is the difference between total revenue and total costs. The results on Table 2 show that, an average of 3620 kg of paddy rice was produced per hectare. The highest production component was fertilizer (31.94%) while the least was taxes at 0.22%. The total costs of rice production stood at ₦254, 907/ha with a net farm income of ₦235, 603/ha. The study showed that revenue generated by farmers was higher than expenses during the production period, which makes the business of rice production in the study area profitable as profits realized exceeded the costs incurred. The result of the analysis also showed that return on naira was ₦0.92 for every naira invested. Also operating ratio of ₦0.49 was also realized.

**Table 2: Cost and return analysis of rice production in selected LGAs of Bauchi State**

Cost Item	Cost ₦/Ha	% of total Cost
<b>Revenue</b>	₦490,510	
<b>Variable costs</b>		
Land Clearing	36,582	14.35
Planting, spray and fertilizer	21,464	8.42
Weeding	12,139	4.76
Irrigation	11,650	4.57
Harvesting, and bagging	40,262	15.80
Transportation and Storage	10,695	4.20
Others	2,840	1.11
<b>Total costs of labour</b>	135,632	
Cost of variable Inputs		
Seeds	10,751	4.22
Fertilizer	81,428	31.94
Agro-chemicals	13,932	5.47
Total Variable Inputs	106,111	
<b>Total Variable Costs</b>	241,743	
<b>Fixed Costs</b>		
Depreciation on assets	12,600	4.94
Taxes	564	0.22
Total Fixed Costs	13,164	
<b>Total Costs</b>	254,907	100
Net Farm Income	235,603	
Return on naira	0.92	
Operating ratio	0.49	

Source: Field Survey, 2022

### Constraints to Rice Production

Results from the findings as presented in Table 3 revealed that high cost of fertilizer (63.04%), insufficient capital (51.01%) and costs of labour (45.65%) were three of the most constraining factors in the study area. High cost of fertilizer implies that since rice farming is capital intensive and requires adequate fertilizer at every stage of production, the required amount of output would not be achieved. This also agrees with Nwalieji (2016) who reported high cost of sold agro-inputs like fertilizer militates against efficient rice production in Anambra state, Nigeria. Insufficient capital could affect rice production as capital is necessary for optimum production. This implies that without sufficient capital, the desired output would not be achieved. The least important constraints were pest and diseases (6.52%). This may imply that most of the farmers use insecticide



and pesticides and hence do not suffer much setback from pest and diseases.

**Table 3: Distributions of respondents according to constraint**

<b>Constraints</b>	<b>Frequency*</b>	<b>Percentage (%)</b>
High Costs of fertilizer	58	63.04
Insufficient Capital	47	51.01
Costs of Labour	42	45.65
Cost of Chemicals	26	28.26
Problem of flooding	21	22.83
Insufficient Irrigation Systems	19	20.65
Inadequate storage facilities	15	16.30
Poor access roads	10	10.70
Poor market information	8	8.69
Pests and diseases	6	6.52

**Source:** Field Survey, 2022

\*Multiple responses present

### CONCLUSION AND RECOMMENDATIONS

The study concluded that rice production was profitable in the study area. Rice farmers in the study area were constrained by high cost of fertilizer, insufficient capital and cost of labour. The following recommendations were made:

- i. Government should take advantage of the high number of educated rice farmers in the study area by employing extension agents to provide adequate trainings at intervals to update rice farmers' knowledge on improved methods and technologies of rice production.
- ii. Provision of necessary inputs (fertilizer, agro-chemicals, and improved seeds among others) by stake holders which are necessary for the sustainability of rice production should be made available at affordable prices and within the reach of the farmers.
- iii. The farmers should have easy access loans and capital through micro finance banks, agricultural banks and easier registration for special government programs like Anchor-borrowers scheme for rice to improve their economic activities.

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