



**ANALYSIS OF PRODUCTIVITY OF RICE FARMERS IN JERE LOCAL
GOVERNMENT AREA, BORNO STATE, NIGERIA**

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ABSTRACT

The study analysed the productivity of rice farmers in Jere Local Government Area, Borno State, Nigeria. Jere LGA was purposively selected due to concentration and availability of rice farmers. A simple random sampling technique was applied to select 50 respondents. Data were collected using structured questionnaire. The data collected were analysed using descriptive statistics and Total Factor Productivity (TFP) model. The findings revealed that the respondents were mostly male (88%) and within the age group of 20-49 years. The result show that majority of the rice farmers were married (58%) and 32 % of the rice farmers had secondary education. The total factor productivity model showed an output growth rate of 0.03%/ha. Major constraints affecting rice production in the area include: labour cost; lack of credit facilities; pest and diseases; and market accessibility. The study concluded that rice production in the study area is productive with a TFP growth rate of 0.03%/ha. The study therefore, recommends that Governments' policies should be designed to ensure adequate supply of farming inputs such as improved seeds and fertilizers in good quantity and quality at subsidized rate to younger farmers to encourage them as they form majority of rice farmers.

Keywords: Analysis, Factor, Farmers, Productivity and Rice

INTRODUCTION

Rice is from the family, *Gramineae*, Genus, *Oryza*, species: *sativa* L. and *Oryza Glaberrima*. It was brought to West Africa in the early 19th century (Jirgi *et al.*, 2009). Rice is a very important food crop in the world because it is the second largest cereal consumed after wheat which provides staple food for more than half of the world's population with about 80% of its food calorie requirements (Inuwa *et al.*, 2011).

In Nigeria, rice cultivation is an age long enterprise providing employment opportunity and source of food to vast and diverse population of the country. It is ranked the fourth major cereal crop in Nigeria after Sorghum, millet and maize in terms of cultivated area and output (Babafada, 2003). The importance of rice in the Nigerian diet can succinctly be explained by its production pattern over the years. Starting from the 1960s when 360 metric tonnes of locally produced rice was unable to meet local demand, to the 1.45 million tonnes produced in the 1990s which also fell far short of demand (National Cereals Research Institute, NCRI, 2004). Efforts by the federal government to boost rice production in the country and discourage importation completely is yielding positive results as the nation's annual rice production has increased to 5.8 million tonnes, and also Nigeria's earnings from local rice production in the past three years had been on an ascending order, increasing from 2.40bn (5.3 million metric tonnes) in 2016 to 2.46bn (6.15metric tonnes) in 2017 and 2.48bn (6.8 metric tonnes) in 2018 (National Bureau of Statistic NBS, 2018). In 2022, the quantity of milled rice produced in Nigeria was estimated at 5.4 million metric tons. Between 2010 and 2021, milled rice production in the country generally increased. The largest growth in output was registered in 2010, when the crop volume experienced a 26 percent increase compared to the previous year (Doris, 2022).



With this development, it has become obvious that the nation is inching towards self-sufficiency in rice production and will sufficiently start exporting the commodity to other nations. Nigeria is not just the largest consumer of rice in the African continent, but is also one of the largest rice producers in the continent, with a demand of 7.9 million metric tonnes while local production is 5.8 million metric tonnes, and a deficit gap of 2.1 million tonnes of rice yearly, making it the third largest importer of rice worldwide (FAO, 2018). Rice is cultivated and consumed in all parts of Nigeria.

Borno State is one of the States in Nigeria where rice production is highly practiced. Production of rice is largely carried out during the dry season under irrigation condition, although it is also grown under rain-fed agriculture. About 10,000 hectares of land are devoted to rice production in the State (BOSADP, 2010). Jere Local Government Area Borno State produce about 40-45% of total production in the State due to River Ngada which passes through it. The Government is implementing a number of schemes to help the farmers boost their productivity by reducing cost of production, achieving higher yield per unit and by realizing remunerative prices and use of fertilizer (BOSADP, 2010).

Agricultural productivity is an important component of food security. Increased productivity results to food sufficiency which the ever-growing world population depends for sustainability. To adequately sustain the population, agricultural productivity must be maintained optimally through efficient use of factors of production. Basically, of the four factors of production, labour remains the most essential factors that manipulate farm inputs to produce efficient outputs (Ekpe and Alimba, 2013). In Nigeria, the indispensability of labour emanates from the fact that its agricultural system is labour intensive oriented. Essentially, the economics of rice production from the last two decades significantly impacted the national development of the Nigeria State. This impactful popularity of rice was derived from the rising level of productivity, level of income and the relative convenience with which it was produced, processed and preserved (Ekpe and Alimba, 2013).

Studies on productivity revealed different methodological approaches to measure productivity as well as different concepts and types of productivity. Various methods of estimating productivity growth have yielded different results due to different assumptions and methodological peculiarities (Coelli *et al.*, 2005). Most researches use Data Envelopment Analysis (DEA) approach in estimating productivity (Makinta, 2018; Sulumbe, 2015). Agricultural productivity may also be measured by what is termed as Total Factor Productivity (TFP). This method of calculating agricultural productivity compares an index of agricultural inputs to an index of outputs. Therefore, this research work attempts to compute productivity using TFP. This measure of agricultural productivity was established to remedy the shortcomings of the partial measures of productivity commonly used. Therefore, the specific objectives of the study was to describe the socioeconomic characteristics of rice farmers, determine their productivity and identify constraints associated with rice production in the study area.

MATERIALS AND METHODS

The Study Area

The study was carried out in Jere Local Government Area (LGA), Borno State. The LGA is one of the 27 LGAs of Borno State. Jere has land mass of 868km² with a population of about 293, 800 (National Population Commission, 2006). It is located on latitude 11° 40' and 12° 15'



North and longitude 13° 05 and 13° 20¹ East. It is inhabited by major tribes of the Kanuri, Shuwa Arab, Hausa, Fulani and few other ethnic groups. Jere has an average temperature between 58°F-106°F, the weather condition is warmer during the raining season (April-October) and colder during the harmattan period (December-February). The mean annual rainfall is 850mm and has a relative humidity level of 29 percent. The soil is generally sandy loam dominated by grasses, shrubs and few trees which encourages grazing. The major occupation of the people is farming, trading and civil servant. The common crops grown in the area include millet, sorghum, rice, legumes, mangoes and guava. Livestock rearing include cattle, sheep goat and poultry.

Method of Data Collection

Data were collected using structured questionnaires that were administered to the respondents.

Sampling Techniques and Sampling Size

Jere LGA was purposively selected due to concentration and availability of rice farmers. Simple random sampling techniques was applied to select 50 rice farmers for the study

Analytical Technique

Descriptive statistics such as percentages, frequency and mean as well as inferential statistics such as total-factor productivity measure was used to analyse the specific objectives of the study. Total-factor productivity is ratio of output to a group of inputs such as labour and capital. Total-factor productivity is an index of output obtained from more than one of the resources (inputs) used in production. It is the ratio of net output to the sum of associated labor and other factor inputs. The multi-factor productivity is explicitly computed as:

$$A = \frac{Y}{K^\alpha + L^\beta} \dots(1)$$

Where;

A= Total-factor productivity

Y= Output (kg)

L= Labour input (hrs)

K= Capital inp ut (₦)

α & β = two input's respective shares of output (α and β are the share of contribution for K and L respectively)

RESULTS AND DISCUSSION

Socioeconomic Characteristics of Rice Farmers

The socio-economic characteristics of rice farmers considered include gender, age, marital status, educational status, family size and farm size was presented in Table 1. Result on gender distribution of respondents shows that majority (88%) of the respondents were male while only 12% were female. This reveals that male farmers participate more in rice production than female in the area. This could be as a result of the tedious nature of rice production, which women may not withstand. Result on age distribution reveals that the majority (84%) of the rice farmers in the study area were young as they fall within the age group of 20-49 years with mean age of 33 years. This shows that rice farmers are within their active age bracket and relatively younger farmers who could work longer hours on the farm. Result on education level of respondents indicates that 80%



of the farmers had attained one form of education at different levels. The result indicated that 22% of the respondents in the study area had primary education, 34% had secondary education, 26% had tertiary education and 18% had no formal education. This implies that most of the respondents are literate, this implies that farmers can understand new innovation and adopt recommended practice for improving their yields in order to obtain higher profit from their produce.

Forty four percent (44%) of the respondents had family size of 1-3 persons while 56% had a family size of 4-10 persons and above with average household size of 4 person. This result is in line with the study conducted by Idrisa (2008), that 40% of farming households in Jere local government area of Borno State had a family size between 7-9 persons. However, the farm size is useful in determining the production scale of the farmers, the result shows that 50% of the farmers had farm sizes between 1-2 hectares, 30% of the farmers had a farm size between 2-3 hectares and 20% of the respondents had a farm size between 3-4 hectares. The average farm size was put at 1.5ha. It can be concluded that rice farmers in study area are small scale farmers.

Table 1: Socio-economic characteristics of rice farmers (n=50)

Socioeconomic characteristics	Frequency	Percentage (%)	Mean
Gender			
Male	44	88	
Female	6	12	
Age (years)			
20-29 years	14	28	
30-39 years	16	32	33
40-49 years	12	24	
50 years and above	8	16	
Marital status			
Single	11	22	
Married	29	58	
Divorced	4	8	
Widow	6	12	
Educational qualification			
Primary	11	22	
Secondary	17	34	
Tertiary	13	26	
No-formal education	9	18	
Family size			
1-3 persons	22	44	
4-6 persons	13	26	4
7-9 persons	10	20	
10 persons and above	5	10	
Farm size (ha)			
1-2	25	50	1.5
2-3	15	30	
3-4	10	20	
Total	50	100	

Source: Field Survey, 2023

Productivity of Rice Farmers in the Study Area

Table 2 shows average inputs and output structure of rice production per hectare and estimated total factor productivity of rice farmers in the study area. The result shows that average quantity of rice harvested was 3,000kg/ha using 75-hour man-day. Labour constituted 48.7% of variable cost. The average quantity of seed planted was 62.5kg/ha, constituting 9.74 of the cost of variable inputs. Cost of fertilizer constitute 32.47% of the total variable cost. The result of the



productivity shows a TFP growth rate of 0.03%/ha. This indicates that if all variable inputs used in rice production were proportionately increased by a unit, rice output will consequently increase by 0.03%/ha. It also means that the combined factor inputs used in rice production has a positive effect on rice output. The results also show that an output of 3000kg per hectare was realized by individual farmer after incurring a total cost of ₦154,000 per hectare.

Table 2: Productivity of rice farmers in the study area (n=50)

	Qty hectare	perUnit price (₦)	price per hectare (₦)	Percentage (%)
Output				
Rice harvested	3000kg	240/kg	720,000	
Labour	75 hours	600/hr	75,000	48.7.
Seed	62.5kg	240	15,000	9.74
Fertilizer	-	-	50,000	32.47
Pesticides and herbicides	2 pack	4200/pack	8,400	5.45
Packaging	30bags	187/bag	5,600	3.64
Total inputs			109,000	
Total			154,000	100
Productivity:			A=0.03%/ha	

Source: Field Survey, 2023

Constraints to Rice Production

Table 3 shows the constraints affecting rice production in the study area. Labour cost ranked first (48.7%) constraint affecting rice farmers in the study area. Other constraints include lack of credit facilities, pest and diseases and market accessibility accounted for 26%, 20% and 14%, respectively.

Table 3: Constraints to rice production

Constraints (n=50)	Frequency	Percentage	Rank
Labour cost	20	40	1 st
Lack of credit facilities	13	26	2 nd
Pest and diseases	10	20	3 rd
Market accessibility	7	14	4 th
Total	50	100	

Source: Field Survey, 2023

CONCLUSION AND RECOMMENDATIONS

Based on the findings of the study, it is concluded that the TFP growth rate of rice production in the study area was estimated as 0.03%/ha. Productivity however, can be increased if all variable inputs used in rice production are increased by a unit. Rice production has a lot of potentials; however, the farmers are faced with lot of constraints which include; labour cost, pests and disease attack and market accessibility. In order to improve the productivity of rice farmers in Jere Local Government Area, Borno State, Nigeria, the following recommendations were made;

- i. Government policies should be designed to ensure adequate supply of farming inputs such as improved seeds and fertilizers in good quantity and quality at subsidized rate to younger farmers to encourage them as they make majority of rice farmers.
- ii. Women and old farmers should be engaged in rice production by providing mechanized



- farming by the government and agricultural development agencies in order to reduce labour.
- iii. Credit facilities should be given to farmers without much collateral and protocols. The credit facilities should be given to them through extension agents who have knowledge of the felt need of the people.

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