International Journal of Applied and Scientific Research (IJASR)
Vol. 1, No. 2, 2023 : 139-146

Economic Analyses of Small holder Rice Farmers in Kebbi State, Nigeria

Danmaigoro. A[1]*, Ahmad. A[2], Sanda, H.Y[3], Audu S[4]
[1,2]Adamu Augie Collage of Education Argungu, Kebbi State, Nigeria
[3]Federal University of Agriculture Zuru, Kebbi State
[4]Kebbi State University of Science and Technology, Aleiro, Kebbi State
Corresponding Author: Danmaigoro. A danmaigoroaliyu@gmail.com

A R T I C L E I N F O

Keywords: Agriculture, Farmers, Rice, Production

Received : 20, August
Revised : 5, September
Accepted: 18, October

A B S T R A C T

This study examined the economic analysis of rice production in Kebbi State, Nigeria. The specific objectives were to identify the socio-economic characteristics of the respondents, estimate the cost and returns, and evaluate the efficiency of resource use. Primary data were used in the study. They were obtained through a questionnaire A total of 160 rice farmers engaged in rice production were investigated. The collated data were analyzed using descriptive statistics, budgetary analysis, and resource use efficiency models. Results from the analyzes revealed that most rice farmers were above productive age, experienced, and could read and write. Empirical results also revealed that rice production is viable with approximately 40% return on investment for every N1 invested in the rice farming enterprise. Resource use efficiency in the study area showed underutilization of seed, farm size, fertilizer, and agrochemicals. It is recommended that the farmers in the study area should be provided with farm input and improved technologies, which could enable them to become more efficient in rice production and further guarantee sustainable growth and food security.

INTRODUCTION

In Nigeria, rice is a basic food that is widely consumed by people from various socioeconomic backgrounds and geopolitical zones (International Institute of Tropical Agriculture (IITA), 2020). Nigerians are consuming more rice than ever before due to rising economic levels, rapid urbanization, population expansion, and a shift in consumer preferences toward rice (Kamai et al., 2020). Typically, it is boiled and served with vegetable soup or stew. Additionally, it is utilized to make a variety of regional cuisines that are consumed in every home, particularly on special occasions like festivals and rituals. Nigeria has an annual rice consumption of about 5.7 million tons (Mt), of which 1.6 Mt are imported at an estimated cost of $1.6 billion. Furthermore, local rice sells for a substantial discount because it cannot compete with imported brands on quality (Africa Rice Centre (ARC), 2018). To close the gap between domestic demand and supply, a significant amount of milled rice is imported to make up for the production shortage (Chidiebere-Mark, 2017). Therefore, increasing rice production might benefit the country's foreign exchange profits as well as internal food security. Since the 1970s, Nigeria's domestic rice production has also grown dramatically, averaging about 10% year (World Agricultural Supply and Demand Estimates (WASDE), 2020).

The agricultural landscape in Nigeria is evolving due to heightened government initiatives to encourage private sector participation and enhance domestic output (IITA, 2020). The majority of rice farmers in Nigeria's key rice-producing states—Kebbi, Borno, Kano, Ebonyi, and Kaduna, among others—employ traditional methods with little to no utilization of better input technologies (Kamai et al., 2020). For rice output and productivity to increase in different states of Nigeria, farmers must adopt improved varieties and possess a solid understanding of rice agronomy. By preserving the vital foreign cash required for the purchase of rice from Asia and other regions of the world, the commercial production of rice will help Nigeria's economy grow (Madu and Aniobi, 2018).

Over time, Nigeria's rice production has been insufficient to meet demand. Nigeria's inefficiency contributes to the country's incapacity to produce enough rice on its own. Nigeria's rice production system is typified by a lack of industrial drive, poor transportation, insufficient knowledge of postharvest handling, processing, and marketing, and poor harvesting abilities. According to Dauna et al. (2018), there are other problems as well, such as bad government policy, excessive production costs, inadequate finance facilities, and poor market intelligence.

Rice production serves as a bridge between production and consumption. Kebbi State is one of the rice producing States in Nigeria with a high prospect for an increase in production over the years. If rice production is assessed and empirical information on profitability, prices, and determinants of profit along with the constraints involved in rice production are examined and made available, there is probably an improvement in the performance of rice production in the State and the country at large.

METHODOLOGY

The research was carried out in Nigeria's Kebbi State. The state is located in the northwest Sudan Savanah between longitudes 3° 351 and 6° 031E of Greenwich and latitudes 10° 051 and 13° 271N of the equator. A multistage sampling strategy was utilized in the study to pick rice growers who were chosen on purpose. Kebbi State was initially divided into four (4) zones for the Agricultural Development Project (ADP): Argungu, Bunza, Yauri, and Zuru. In the second step, two villages were chosen at random from each of the zones, for a total of eight communities. Twenty rice growers were chosen at random from each community. Thus, the study's sample size consisted of 160 respondents. A well-structured questionnaire that was given to the respondents was used to gather data. One production cycle's worth of input-output data were gathered, including information on farm size, labor from family members, hired labor, planting materials, capital, rice output, price and amount sold, and respondents' socioeconomic status. Descriptive statistics and gross margin analysis were among the instruments utilized in this study to analyze the collected data.

RESEARCH RESULT AND DISCUSSION

Socioeconomic characteristics of rice farmers

The socioeconomic characteristics of interest in this study are; age distribution of the farmers, gender, education, membership of an association, experience, and source of funds. These have been represented in the frequency table and are shown in Table 1. Empirical results show that most farmers between the ages of 46 years and above (50%) were more involved in rice production in the study area. The average age of the respondents is 46. Age is an important determinant of social – the socioeconomic status of a population since people wear in energy as they advance in age. Therefore, these generally aged rice farmers could have negative implications for the future of rice cultivation in the study area.

Table 1: Social-Economic Characteristics of Rice Farmer

Variable	Frequency	Percentage
Age of the Respondent		
≤ 30	26	16.25
31 – 45	44	27.5
46 – 55	80	50
≥55	10	6.25
Gender		
Male	135	84.4
Female	25	15.6
Education Status		
No formal education	80	50
Primary education	36	22.5

Secondary Education	15	9.4
Tertiary education	09	5.6
Qur'anic education	20	12.5
Membership in a cooperative society		
Yes	140	87.5
No	20	12.5
Major Source of Funds		
Personal saving	90	56.3
Money lender	20	12.5
Bank loan	10	6.2
Cooperative fund	40	25
Years of Experience		
≤ 10	30	18.8
11 – 20	90	56.3
21 – 30	25	15.6
≥ 31	15	9.3

Source: Field survey 2023

Table 1 also shows that rice production is dominated by males in the study area, as approximately 84.4% of the respondents are male. This can be attributed to the fact that men always have the right to land as a productive resource Quisumbing (1994) reported a great disparity between women and men in the size of landholdings and that the mode of women's participation in agricultural production varies with the land-owning status of households. The male domination of male farming may also be due to the high demands of time and energy required to work in such an enterprise. This agrees with the study of Baiyegunhi and Fraser (2009).

The study shows that 50% of the farmers had no formal education, whereas about 50% of farmers had one form of formal education or the other. This implies that rice farmers in the study area are generally knowledgeable. Education is an investment in human capital, which enables it to raise the skill and quality of the individual. Therefore, the introduction of new ideas and the adoption of innovations and technology into the study areas will be easy. This will in turn increase yield, income, and agricultural production in general.

The majority of the rice farmers (56.3%) have been producing rice for more than 11-20 years, while approximately18.8%) have at most 10 years of experience. Therefore, it can be inferred that most farmers are experienced rice growers. The credit facility was predominantly through personal savings (56.3%). Only about 6.2% borrowed money from banks for farming activities. This situation calls for urgent interventions by stakeholders in the agricultural sector.

Costs and Returns Analysis

A gross return was calculated by multiplying the total quantity of produce harvested by the price of the output sold. The results are shown in

Table 2. The gross return per hectare in rice production in the study area was ₦*80,701.42*. For the cost of production, the total variable cost and total fixed cost were considered to calculate the total cost of production. The total variable cost includes the cost of labour, chemicals, fertilizer and seeds, whereas the total fixed costs include the cost of renting/borrowing land and depreciation on farm tools. The straight-line method, which assumed a constant rate of annual depreciation, was used to calculate the depreciation of farm tools.

The labour used consists of family, hired and group labour. The wage rate varies slightly depending on the operation to be performed on the farm. The average wage rate of ₦850.00 per man-day was used to calculate the total labour cost. The total cost of labour per hectare was ₦27, 826.54. This cost accounted for 54.5% of the total production. Labour is generally noted to be one of the most important factors of production, especially regarding farming experiments. Fertilizer accounts for approximately 25.3% of the production cost. Agrochemicals account for 15.7% of the total variable cost.

Baiyegunhi and Fraser (2009) observed that to increase yield, seed-dressing chemicals such as herbicides and pesticides that prevent undue exposure of cultivated seeds to fungal attacks must be used.

The gross margin and net farm income (profit) per hectare were ₦80,701.42 and ₦91,416.67. The rate of return on investment was ₦140%. These results imply that for every ₦1 invested in the rice farming enterprise in Kebbi State, ₦1.40 was made as revenue. That is, approximately 40 kobo are realized as profit. The rate of return on capital invested estimate (RORCI), otherwise called the efficiency level, is 0.40. This suggests the profitability and viability of rice farming in Kebbi State as this value is higher than the lending rate of between 6 % and 25% charged by both cooperative societies and commercial banks in the study area.

Table 2: Gross margin and returns in investment/acre

Item	Amount (₦)
Total Revenue	80,701.42
Labour	27,826.54(54.6)
Cost of chemicals	8,013.99(15.7)
Cost of fertilizer	12,907.63(25.3)
Cost of the seed	2,262.50(4.4)
Total variable cost	51,010.66
Gross margin	29,690.76
Fixed cost/depreciation*	6,760.49
Net Farm Income/Profit (NFI)	22,930.27
Rate of Return on Investment (ROR)	1.40 (140%)
Efficiency level/(RORCI)(%)	0.40 (40%)

Source: Field survey 2023

Efficiency of Resource Use

In determining the efficiency of the inputs used, the marginal value product and the marginal factor cost (MVP and MFC) were estimated. The marginal factor cost, which is the unit price for the variable inputs used for rice production in the study areas, was estimated as ₦7,500, ₦4,500, ₦4560, and ₦850 for seed, farm size, fertilizer, and chemical, respectively. This result is presented in Table 3 .

Seed input is used below the economic optimum level, as indicated by its efficiency ratio of 244.35. It is therefore rational to increase the quantity of seed as this will bring about a corresponding increase in the total value product of approximately ₦1,832.60.

Fertilizer was also seen to be under-utilized, as shown by its efficiency ratio. This suggests that with other inputs held constant, increasing fertilizer by one kilogram would increase the total value product by ₦893.90. Other inputs were also observed to be currently under-utilized. Therefore, it is economical to increase the use of these inputs for optimal return on investment in the study area. Hence, resource use adjustment and an optimal combination of these parameters should be accepted by farmers in the study area.

Table 3: Resource use efficiency for rice production in Kebbi State

Resource	MPP(Kg)	Unit price of input (N'000)	MVP(N)	MFC(N'000)	R=MVP/MFC
Seed	0.2618	7.50	1832.60	7.50	244.35
Farm Size	0.7888	45.00	5521.60	45.00	122.70
Fertilizer	0.1277	4.56	893.90	4.56	196.03
Chemical	0.0586	0.85	410.20	0.85	482.59

Source: Field survey 2023

Constraints Involved in Rice Production in the Study Area

The results in Table 4 show the constraints associated with rice farmers in the study area. The major constraints identified by the respondents were inadequate storage facilities and inadequate capital (87.5%) and (83.1%), access to land and high cost of transportation (76.9%), lack of a milling plant in the study area (56.3%), and poor road network (74.4%).

Table 4: Constraints involved in rice production in the study area.

Constraints of rice farmers	***Frequency**	**Percentage (%)**	**Rank**
Inadequate capital	133	83.1	2
Access to land	123	76.9	3
Lack of milling plant	90	56.3	6

Inadequate storage facilities	140	87.5	1
Poor road network	119	74.4	5
High cost of transportation	123	76.9	3

Source: Field survey 2023

CONCLUSIONS

This study examined economic analyzes of rice farmers in Kebbi State. Primary data were used in the study and were obtained using a multi-stage sampling technique and through a questionnaire. The study revealed that 50% of the rice farmers were above productive ages and that rice production was mainly dominated by males with most farmers (84.4%) having the ability to read and write. The empirical result also revealed that rice production is more viable with about 40% return on investment for every N1 invested in the rice farming enterprise. Resource use efficiency in the study area showed underutilization of seed, farm size, fertilizer, and agrochemicals.

Rice production was found to be viable and profitable under efficient management. However, rice potential in terms of yield and quality of the product has not been fully exploited. Consequently, there is still a deficit in rice supply in the country. This could be attributed to the inaccessibility of farmers to appropriate modern technology and innovations such as improved seeds, fertilizer, adequate credit/funds, and adequate extension services. This poses a serious threat to the general food supply in the future if nothing is done to correct the imbalance in rice production.

RECOMMENDATIONS

1) Farmers in the study area should be provided with inputs such as seeds, fertilizer, agrochemicals, and the services of qualified extension workers. This will enable them to become more efficient in rice production and further guarantee food security.
2) Improved technologies that can guarantee sustainable and continuous rice production throughout the year should be extended to farmers for adoption.

REFERENCES

Africa Rice Center, (ARC 2018). *Africa Rice Centre annual report 2018*: Africa-wide rice agronomy Task Force. Cotonou, Benin, Africa Rice Center.

Baiyegunhi, L. J. S. and Fraser, G.C.H. (2009): Profitability in sorghum production in three villages of Kaduna State Nigeria. *Journal of Applied Sciences Research*, 5 (10): 1685-1691 INSI net Publication.

Chidiebere-Mark, N.M (2017). "*Analysis of value chain in rice production systems* " Ebonyi State, Nigeria. Department of Agricultural Economics, Federal University of Technology, Owerri.

Dauna Y., D.Y. Giroh , W.B. Adamu, (2018). *Analysis of structure and performance of paddy rice marketing in Adamawa state, Nigeria*. Department of Agricultural Economics and Extension, School of Agriculture and Agricultural Technology, Modibbo Adama University of Technology, Yola, Nigeria. *An International Journal Published by Faculty of Agriculture. Trakia University, Stara, Bulgaria*. ISSN 1313 - 8820 (print) ISSN 1314 - 412X (online) Volume 10, Number 2, pp 174 – 177, June 2018.

International Institute of Tropical Agriculture (IITA, 2020). "*Guide to rice production in Northern Nigeria". Revised Edition 2020. Published by the International Institute of Tropical Agriculture, Ibadan, Nigeria.* https://cgspace.cgiar.org/bitstream/handle/10568/108804/Guide%20to%20Rice%20Production%20in%20Northern%20Nigeria.pdf?sequence=1

Kamai N., Omoigui L.O., Kamara A.Y., and Ekeleme F. (2020). *Guide to Rice Production in Northern Nigeria. International Institute of Tropical Agriculture, Ibadan, Nigeria*. 27 pp.

Madu A. B. and Aniobi U. J. (2018). "*Profitability analysis of paddy production: A case of agricultural zone 1, Niger State Nigeria*". Department of Agricultural Economics and Extension Services, Ibrahim Badamasi Babangida University Lapai. *Journal of Bangladesh Agricultural University*. ISSN 1810-3030 (Print) 2408-8684 (Online) 16(1):88–92

National Population Commission (NPC) (2006). Population Figure. Federal Republic of Nigeria, Abuja. Retrieval from https://www.npc.gov.ng

Olukosi, J.O. and Erhabour, P.O. (1988): Introduction to farm management economics: Principles and applications. AGITAB Publishers Ltd Zaria, Nigeria.

Quisumbing A. (1994): Gender differences in Agricultural Productivity: A survey of empirical evidence. Discussion paper series No.36, Education and Social Policy Department, World Bank Washington D.C.

Samm, B.M. (2009): Gross margin analysis and linear programming; Tools in understanding how farmers in the guinea savannah region of Nigeria rejected the most profitable type of sorghum recommended by scientists. Proceedings; pre-conference of the Western Agricultural Economics Association 2009 meeting. June 24, pp. 120.

World Agricultural Supply and Demand Estimates, WASDE (2020). *Annual Report November 2020*. Published by the United States Department of Agriculture (USDA).