COST AND RETURNS ANALYSIS OF PADDY RICE IN NASARAWA STATE AND FEDERAL CAPITAL TERRITORY ABUJA.

By

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ABSTRACT

Considering the ever increasing population growth and urbanization, there is a high need and increasing demand for rice. Rice consumption is no longer a thing of luxury but a necessary staple food for many. This research was conducted to determine the profitability considering the cost and returns of paddy rice production in Nasarawa state and F.C.T, Abuja. Data for the study were collected from 120 randomly selected paddy rice farmers using a well-structured questionnaire and analysed using the descriptive statistics, Net farm income model. The result showed that 77% were male, 80% married and household size of 1-3 people was the highest with 63%. The respondents had 93% formal form of education ranging from primary to tertiary form of education. Cost and Returns analysis for rice production showed total variable cost to be ₦ 81,109.61 and total fixed cost as ₦ 16, 357. The value of output/ha was estimated to be ₦ 201, 383.81 while the net farm income per ha was ₦ 103, 917.33. This finding implies that rice production is profitable. Variability in prices of rice was ranked as the foremost constraints militating against the performance of rice producers as asserted by 95% of the respondents. This study however concluded that paddy rice production in the study areas is a profitable enterprise and recommends that the farmers in the study areas should be encouraged and sensitized in their activities in order to attain self-sufficiency in rice, also consistent government policies that would favour increase in paddy production, market information, extension service delivery, input subsidization and credit facilities be implemented.

Keywords : Costs and Returns, Paddy Rice, Production, Nasarawa state, FCT, Abuja

INTRODUCTION

Rice is one of the major cereal crops of the tropical regions of the world. It ranks second among the staple food crops in Nigeria (Nwele, 2016). Rice (*Oryza sativa* L.) being the second largest consumed cereal (after wheat) shapes the lives of millions of people. More than half the world's population depends on rice for about 80% of its food calorie requirements. It has become a staple food in Nigeria such that every household; both the rich and the poor consume a great quantity (Agbonika, 2021). Per capita consumption of rice in Nigeria in the 1980s was about 18kg which rose to 22kg between 1995 and 2000 according to Akpokodie, Lancon and Erestien (2001), Ogundele and Okoruwa (2006). The demand for rice in Nigeria has assumed a steady rise in the last decades as it is easy to prepare compared to other traditional food (Ochigbo, 2011). A combination of various factors seems to have triggered the structural increase in rice consumption over the years with consumption broadening across all socio-economic classes, including the poor. Rising demand is as a result of increasing population growth and income level (GAIN, 2012) coupled with the ease of its preparation and storage. Rice has changed from being a luxury to a necessity whose consumption will continue to increase with per capita GDP growth, thus implying that its importance in the Nigerian diet as a major food item for food security will

increase as economic growth continues (Ojogho and Alufohai, 2010). Nigeria is the largest producer and consumer of rice in West Africa and in sub-Saharan Africa (SSA), but its local rice supply-demand deficit has persistently expanded. Although local rice production has increased since 1990s, the increase has not been sizeable enough to satisfy local rice demand (Johnson, M., Hiroyuki, T., & Gyimah-Brempong, K. (2013). This has resulted in a large domestic supply-demand gap, leading to massive importation of rice products (Aminu, A., Obi-Egbedi, O., Okoruwa, V. & Yusuf, S (2012). Despite the relative importance of rice as Nigerian major food and industrial material, the domestic supply is still considered insufficient to match the consumption demand. The local production falls short of the demand (Basorum and Fasakin, 2012) hence, leading to augmentation of shortfall through import. The country initiated range of programmes designed to boost local production since rice plays an important role in the food security of urban and rural households in Nigeria. These include: the Nigerian National Rice Development Strategy (NRDS) set up in 2009 aimed at making the country self-sufficient in rice by raising production of paddy rice from 3.4 million tonnes in 2007 to a targeted 12.8 million tonnes in 2018 also Based on this, national Agricultural Transformation Agenda tagged Agricultural Transformation Action Plan (ATAP) was established in 2012 through the development of value chain in selected key crops which include rice, cassava, sorghum, cocoa and cotton.. Considering the recent policies and programmes designed by the government to increase paddy rice production in the country, this research is designed to identify the socio-economic characteristics of the rice farmers, assess the production of the crop with regard to the margin that accrues to rice farmers, and major constraints militating against the production of rice in the study area. This study is therefore, intended to look at the following objectives:

i. determine the socio-economic characteristics of the rice farmers

ii. determine the margin that accrues to rice farmers in the study area

iii. identify major constraints militating against the production of rice in the study area

METHODOLOGY

The study was conducted in Nasarawa state and Federal Capital Territory (FCT), Abuja. Nasarawa state lies between latitude 7^0 and 45' and between 7^0 and 9^0 37' E of the Greenwich meridian (Marcus and Binbol, 2007). Nasarawa State is centrally located in the Middle Belt region of Nigeria. It shares boundary with Kaduna state in the North, Plateau State in the East, Taraba and Benue states in the south while Kogi and the Federal Capital Territory flanks it in the West. The state has a total land area of 26,875.59 square kilometers and a population of about 1,826,883, according to the 2006 population Census estimate with a density of about 67 persons per square kilometer. Nasarawa State is made up of thirteen Local Government Areas, namely, Akwanga, Awe, Doma, Karu, Keana, Kokona, Lafia, Nasarawa, Nasarawa Eggon, Obi, Toto, Wamba and Keffi. The people of Nasarawa state includes among others; the Gwandara, Alago, Eggon, Gbagi, Egbira, Migili, Kantana, Fulani, Hausa,Kanuri, Tiv, Afo, Gade, Nyankpa,Koro, Jukun, Mada, Ninzam, Buh, Basa, Agatu,

Arum, Kulere, and also settler groups like the Igbo, Yoruba and Hausa.

Federal Capital Territory (FCT) Abuja is located between latitudes $9^0 25'$and $9^0 21'$ north of the Equator and Longitudes $6^0 45'$ and $7^0 39'$ east of the Greenwich meridian. Abuja shares boundary with Kaduna State to the north, Niger State to the west, Nassarawa and Kogi States to the east and south respectively. It covers an area of 8,000 square kilometres with a population of about 1,405, 201 people (National Population Commission- 2006). Abuja comprises of six (6) constitutionally recognised area councils namely: Abaji, Bwari, Gwagwalada, Kuje, Kwali and Abuja Municipal.

Nassarawa state and Federal Capital Territory was selected purposively on the basis of being a prominent rice producing State in the north central. A three step sampling procedure was adopted in the choice of sample for this study. Lafia, nassarawa, Gwagwalada and Abaji were selected purposively from the two states based on their prominence in rice farming activities. The second stage was to identify the registered paddy rice farmers with farm sizes of 1ha and above in the two rice producing local government council/ area council already selected with the help of Agricultural Development Programme (ADP) extension agents. This list served as the sampling frame for the study. The third stage involved a random sampling of thirty (30) rice farmers from each of the rice communities bringing the sample size for the study to one hundred and twenty farmers. A well-structured questionnaire was used to obtain the necessary data from the rice farmers.

Descriptive statistics was used for the socio-economic characteristics and factors militating against rice production and to determine the margin accrued to rice farmers the Net Farm Income (NFI) model was employed. The component of net farm income includes farm cash receipt, farm operating expenses, income in-kind, depreciation charges, and value of inventory change.

Net Farm Income (NFI) is expressed as;

NFI = GFI – TVC – TFC …….eqn 1

Where:

NI = Net income from paddy production (₦)

GFI = Value of total rice output (₦)

TVC = Total variable cost of rice (₦)

TFC = Total fixed cost of rice (₦)

The agriculture economic statistics uses three aggregate measures of net farm income:

• Net cash income measures farm business cash flow (gross revenue minus operating expenses) generated from the production of agricultural goods. Net cash income represents the amount of money available for debt repayment, investment or withdrawal by the owner.

• Realized net income measures the financial flows, both monetary (cash income) and non-monetary (depreciation and income-in-kind), of farm businesses. Similar to net cash income, realized net income represents the net farm income from transactions in a given year regardless of the year the agricultural goods were produced.

• Total net income measures the financial flows and stock changes of farm businesses. Total net income values agriculture economic production during the year that the

agricultural goods were produced. It represents the return to owner's equity, unpaid labour, management and risk. This model measures return to naira invested in an enterprise. Net Farm Income (NFI) is expressed as;

$\sum NFI = \sum GFI - \sum TVC - \sum TFC$…… eqn 2

Where:

$\sum NI$ = Net income from paddy production (₦)

$\sum GFI$ = Value of total rice output (₦)

$\sum TVC$ = Total variable cost of paddy rice production (₦) expressed as:

$\sum P_i X_j = (P_1X_1 + P_2X_2 + P_nX_n)$……..… eqn 3

$\sum TFC$ = Total fixed cost of paddy rice production (₦) was measured by depreciation of production assets.

The straight line depreciation method was used as equal periodic charges which were estimated over the calculated life span of the asset. This was used because of uniform annual charges. Straight line depreciation method is expressed as

$\sum D = \sum P - \sum S/N$ …… eqn 4

D = Depreciation on production asset

P = Original cost of production asset

N = Number of years of production asset's life

S = Salvage value of the asset

RESULT AND DISCUSSION

The results of the distribution of rice farmers (from table 1) by sex showed that 77% of the producers were male. This indicates the dominance of male in rice production; this is expected given the high labour requirement of rice farming. This is consistent with the findings of Nwalieji *et al.* (2014) and Ibitoye *et al*. (2014) who found that rice production is a male dominated enterprise. The distribution of the producers by age showed that about 51% of the rice farmers were within the active age of 21-30 years. The mean age for farmers was 22 years. This implies that the rice farmers were still within their productive age and can still engage efficiently in rice production, Rice production is labour intensive occupation and exert energy for land preparation, nursery, planting, weeding, harvesting and so on. This is an indication that an active age enhances increased productivity and enables the farmers engage in other value adding activities like rice processing and marketing. The distribution of the rice farmers by their education level revealed that 93% of the producers had formal education ranging from primary to tertiary educations with only about 8% without formal education. Implying that rice producers in the study areas were enlightened and hence they will be more receptive to information on the best practices for improved productivity. This

finding is similar to Omoare and Oyediran (2017), who found that a large proportion (80.6%) of the respondents had formal education while Chidiebere-Mark (2017) found that a large proportion 85% of the rice farmers had formal education.

The distribution of the rice farmers by marital status of the rice farmers showed that about 80 % of the producers were married. These suggest that the rice farmers have a high number of people in their households and these members of households can contribute to family labour, thereby reducing the amount of money spent on hiring labour. This is consistent with the findings of Omoare and Oyediran (2017) who found that 75% respondents from Ogun State were married and 91.2% in Niger State were married, while Chidiebere-Mark (2017) reported that about 86.7 % of the farmers were married.

The distribution of rice producers according to years of experience showed that rice production has been a long time practice among respondents in the study area with a mean of 6 years. Years of enterprise experience usually play a vital role in any enterprise activities and open up one to the knowledge of adopting the best production systems to maximize output and reduce cost (Agbonika, 2021). This is in line with Alabi *et al,* (2012) who opined that experiences should contribute positively or negatively to technology adoption. In addition, experienced farmers' are better able to adopt technologies extended to them to enhance their productivity and efficiency.

Table 1: Socio-Economic Characteristics of Rice Farmers in the study areas

Variables	**Producers**		**Marketers**	
Sex	**Frequency**	**Percentage**	**Frequency**	**Percentage**
Female	28	23	144	90
Male	92	77	16	10
Total	120	100	160	100
Age				
≤ 20	34	28	23	14
21-30	61	51	89	56
31-40	25	21	48	30
Total	120	100	160	100
Mean	22		23	
Minimum	20		20	
Maximum	39		36	
Marital status				
Single	24	20	63	39
Married	96	80	97	61
Total	120	100	160	100
Household Size				
1-3	76	63	125	78
4-6	42	35	35	22
7 And Above	2	2	0	0
Total	120	100	160	100
Mean	3		2	
Minimum	1		1	

Maximum	8		5	
Educational Status				
No Formal	9	8	18	11
Primary	8	7	79	49
Secondary	51	42	39	24
Tertiary	34	28	17	11
Qu'ranic	18	15	7	5
Total	120	100	160	100
Enterprise experience				
1-3	13	10	24	15
4-6	62	52	99	62
7 And Above	45	38	37	23
Total	120	100	160	100
Mean	6		6	
Minimum	2		3	
Maximum	9		8	
Farm Size				
1-3	67	56		
4-6	50	41		
7 and above	3	3		
Total	120	100		
Mean	4			
Minimum	1			
Maximum	9			

Source: Field survey (2019)

Cost and Returns analysis for rice production in the study area

The result in Table 2 shows the costs and returns of rice production in the study area. The total cost of variable inputs (seed, labour, fertilizer and agrochemical) was estimated to be ₦ 81,109.61. The total fixed cost (depreciation on farm tools and rent on land) was estimated to be ₦ 16, 357. The value of output/ha was estimated to be ₦ 201, 383.81 while the net farm income per ha was ₦ 103, 917.33. This finding implies that rice production is profitable. The result revealed that the cost of labour and fertilizers accounted for about 36% each of the total cost of production, depicting that the cost of labour and fertilizers can drastically reduce the profit of rice production in the study area (Rahman *et al*., 2013). The profitability index was estimated to be 1.94, implying that for every ₦ 1.00 invested in farming one hectare of paddy rice, 94k profit was realized. The finding of the study agrees with Mustapha (2012) and Ugwuanyi *et al*., (2018), who reported that rice production along the value chain in Nigeria was profitable.

Table 2: Cost and returns per hectare for rice production

Items	Value (₦/ha)	Percentage
A. Variable costs		
Seed	4,734.52	4.86
Labour	35,175.86	36.09
Fertilizer	35,444.76	36.37
Agrochemical	5,754.46	5.90
Total variable cost	**81,109.61**	**83.22**
B. Fixed cost		
Rent on land	5, 290	5.43
Depreciation on farm tools	11,067	11.35
Total fixed cost	**16, 357**	**16.78**
C. Total cost	**97, 466.48**	**100**
D. Gross return	**201, 383.81**	
E. Net farm income	**103, 917.33**	
F. Profit index	**1.94**	

Source: field survey 2019

Constraints Militating Against the Performance of Rice Producers

The foremost constraints militating against the performance of rice producer's actors as presented in Table 3 was variability in prices of rice which was indicated by 95% of the respondents. This was closely followed by inadequate knowledge of post-harvest handling and technique and inadequate storage facilities alluded to by 92%of the respondents. Poor access to production credit was ranked fourth by 86% of the respondents. Poor access to markets, Poor market information and unavailability of modern and affordable processing facilities was ranked fifth, sixth and seventh by 84%, 82% and 80% of the respondents, respectively. Study by Chetana, Sarthak, Bipin and Sudarshan, (2019) found the following constraints faced in rice paddy production; high cost of the farm equipment, lack of access to market information, lack of access to credit, poor infrastructure and access to market, unavailability of the post-harvest technology and intensive land preparation.

Table 3: Estimate of the Constraints faced by Rice Producers in the study areas

S/no	Constraints	Freq.	Percent	Ranking
1	Variability in prices of rice	199	95	1st
2	Low productivity	44	21	15th
3	Pests and diseases	32	15	16th
4	Poor access to markets	176	84	5th
5	Inadequate knowledge of post-harvest handling and technique	194	92	2nd
6	Inadequate storage facilities	193	92	2nd
7	Poor access to production credit	181	86	4th
8	Poor access to inputs	158	75	9th
9	Poor market information	172	82	6th
10	Competition from imported rice	161	77	8th
11	Unavailability of modern and affordable processing facilities	167	80	7th
12	Climate change	138	66	11th
13	Unavailability of irrigation facilities	120	57	12th
14	Poor access roads	69	33	13th
15	Lack of favourable government policy	49	23	14th
16	Lack of timely access to improved seeds and other inputs	143	68	10th

***** Multiple choices response***

Source: field survey 2019

CONCLUSION

Rice production has become a major source of livelihood for farmers in Nasarawa state and FCT, Abuja not only providing them with basic food requirement but also generating income for farmers through the sales of paddy rice, increasing the number of jobs created particularly at the local government/area councils and contributing to the growth of the economy at large by increasing the Gross Domestic Product (GDP) of the country. Paddy rice production in the two states has not reached it maximum however, the major findings of this study showed that the States has great potentials for rice production. At all levels of operation, the study revealed that paddy rice production in the study area holds a promising prospect for investors as evident in the net returns obtained, the gross return, net farm income and profit index. All these proved positive and hence depict good profit element for paddy rice farmers in the area.

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