PROFITABILITY ANALYSIS OF RICE PRODUCTION IN EBONYI NORTH AGRICULTURAL ZONE OF EBONYI STATE, NIGERIA.

Esheya, Samuel Esheya
Department of Agricultural Economics and Extension
National Open University of Nigeria, Kaduna Campus, Kaduna State.
E-mail: sesheya@noun.edu.ng

ABSTRACT
This study is a profitability analysis of rice production in Ebonyi North Agricultural Zone of Ebonyi state, Nigeria. Multi-stage random sampling technique was adopted to select a sample size of two hundred and forty (240) rice farmers. Data collection was done using a structured questionnaire to elicit responses from the selected rice farmers through oral interview. Descriptive statistics and farm enterprise budgeting tools were used for the analyses. Scarcity of improved varieties, high cost of agrochemicals, access road, farm credit, storage/processing facilities, pests/rodents attack and high labour cost were the major problems identified by the rice farmers as indicated in table 2.The farm enterprise budgeting analysis revealed the costs and returns of rice production to be profitable with a gross margin of ₦383, 242.00 and net farm income ₦363, 242.00. The benefit- cost ratio was calculated to be 3.1 which indicates that rice farmers are selling their produce at a relatively high profit: that is an estimated profit of ₦1 for each ₦3 invested. Thus, it was concluded that rice production is a profitable farm enterprise in Ebonyi North Agricultural Zone of Ebonyi state, Nigeria and farmers should be encouraged to intensify their effort in the production of this staple food crop. It is strongly recommended that government should make timely provision of farm inputs such as improved rice varieties, agrochemicals, farm credit and rice processing equipment available for rice farmers in addition to the provision of adequate rural infrastructural facilities.
Key words: Rice, Production, Problems, Profitability, Analysis.

INTRODUCTION
Rice production is critical for food security in Nigeria. Greater percentage of consumer population all over the world is exhibiting a shift in preference from traditional staple food crops like cassava, yam, cocoyam, potatoes, beans, and maize to rice. There is a demand of 5 million MT of rice yearly in Nigeria. However, only about 3.2 million MT are produced locally (Federal Ministry of Agriculture and Rural Development, FMARD, 2012) with a demand gap of 1.8 million metric tons. According to Abdullahi (2012), the inability to meet rice consumption needs through local production makes the country import-dependent and Nigeria spends about N356 billion annually for about 2 million MT of milled rice. For Nigeria to continue to rely on rice importation to feed her teaming population will spell doom for the country because it discourages local production and increases unemployment. Nigeria is endowed with favourable ecology and land area for rice production but unfortunately these potentials are not being maximized and rice production remains at low level. This is attributable to the fact that rice production is left in the hands of rural farmers who face many production constraints.

Ebonyi state is popular for the production of Abakaliki rice. The state is one of the major rice producing areas and market for locally produced rice in Nigeria. However, there is dearth of information on the profitability analyses of rice production enterprise in the study area and hence the need for this study. The cardinal objective of this study is to analyse the profitability of rice production in Ebonyi North Agricultural Zone of Ebonyi state. The specific objectives were to: describe the socio-economic characteristics of the rice farmers; identify their production problems; and determine the costs and returns on rice production in the study area.

METHODOLOGY
The study area is Ebonyi North Agricultural Zone of Ebonyi state, Nigeria. Ebonyi State which is located in South East region of Nigeria is divided into three agricultural zones namely: Ebonyi North, Ebonyi Central and Ebonyi South Agricultural Zones. Ebonyi North Agricultural Zone consists of four local government areas noted for rice production. These local governments are Abakaliki, Ebonyi, Izzi and Ohaukwu local government areas. Ebonyi is primarily an agricultural region. It is a leading producer of rice, yam, potatoes, maize, beans, and cassava in Nigeria. Abakaliki, is a center of agricultural trade including such products as yam, cassava, rice, and both palm oil and palm kernels, as well as kola nuts. The state lies in the humid tropical agro-ecological zone of Nigeria within Longitudes 70 30'E and 80 30'E and Latitudes 50 40'N and 60 45'N. It has a land area of 5,935 km2 with a projected population of 2,253,140 persons (NPC, 2006). The soil of Ebonyi State is basically clayey and loamy soil. The clayey swampy soil is suitable for rice production and has a luxuriant vegetation of tropical rainforest.

Ebonyi North Agricultural Zone was purposely selected for this study due to the dominance of rice production activities in the area. Six autonomous communities were purposively selected from each of the four aforementioned local government areas that

make up the agricultural zone. Ten rice farmers were randomly selected from each of the six autonomous communities. This gave a sample size of two hundred and forty respondents for the study. The selection was based on the list of registered members of Rice Farmers' Association obtained from the Agricultural Departments of the respective local government areas. The instrument used for primary data collection was a well-structured questionnaire which was personally administered through personal oral interview. Collected data were collated and analyzed using descriptive and inferential statistics. Descriptive statistics such as frequency and percentage were used to achieve objectives i. and ii.; while farm enterprise budgetary analysis such as gross margin, net farm income and benefit – cost ratio analyses were used to realise objective iii.

RESULTS AND DISCUSSION
Farmers' socio-economic attributes
The socio-economic distribution of the farmers is shown in table 1. The results reveal that majority of the rice farmers, 159 (66.3%) fell within the age range of between (31 – 50) years. This implies that the rice farming populations were still within their productive age and can still engage efficiently in rice

production. Yakubu, (2002) concurred with this finding based on his assertion that farmers who are between the ages of 30-49 years are more willing and able to take risk with the expectation of a larger profit than the older farmers. The result further shows that, 221 (92.1%) of the rice farmers were males and almost all of them, 215 (89.6%) were married. Again, 209 (87.1%) of them cultivated farm size of between (2 – 5) hectares and rice is mostly, 188 (78.3%) grown on swamp. Obviously, these findings are in line with apriori principles that male farmers dominate the farming households in Nigeria due to our system of land inheritance, they maintain large family size as cheap source of family labour and operate at small scale level as a result of their economic and social limitations. Result in table 1 also shows that majority *188 (78.3%),* of the rice farmers adopt swamp rice production system. The upland rice production system is the least preferred. This suggests that the risk of drought is higher in the upland rice production system than in the swamp rice production system; and farmers prefer the swamp rice production systems because of its dependence on rain water. This finding is in consistent with that of Epundu (2010).

Table 1: Distribution of respondents by socio-economic characteristics (n = 240)

S/N	Variable	Frequency	Percentage
1.	**Age(years):**		
	Below 30	31	12.9
	31-40	63	26.3
	41-50	96	40.0
	Above 50	50	20.8
2.	**Sex:**		
	Male	221	92.1
	Female	19	7.9
3.	**Marital status:**		
	Single	0	0.0
	Married	215	89.6
	Divorced	18	7.5
	Widowed	7	2.9
4.	**Formal education:**		
	None	23	9.6
	Attended primary	168	70.0
	Attended secondary	49	20.4
	Attended secondary	0	0.0
5.	**Farm size (hectare):**		
	Below 1	21	8.7
	1-2	59	24.6
	3-4	88	36.7
	4-5	62	25.8
	Above 5	10	4.2
6.	**Production system:**		
	Swamp	188	78.3
	Upland	36	15.0
	Both	16	6.7

Source: Field survey, 2019.

Problems of rice production

Every crop enterprise has peculiar conditions that adversely affect its production. This could be either physiological, environmental or market oriented. There are several problems militating against rice cultivation in Ebonyi state as discussed in this section. Table 2 distributed the respondents according to the problems they face in their rice production activities. From the results, Scarcity of improved varieties 186(77.5%); high cost of agrochemicals, 198(82.5%) ; poor access road, 181 (75%), lack of farm credit, 210 (87.5%); lack ofstorage/processing facilities,163 (67.9%); pests/rodents attack,130 (54.1%); and high labour cost,**170** (70.8%) were the major problems identified by the rice farmers in the study area. However, labour constituted the highest cost component of total variable costs. This clearly indicates that large amount of resources is invested on labour requirements. This finding is corroborated with the assertions of Duvvuru and Motkuri, (2013) that: ''rice production is labour intensive and relies on a significant usage of paid labour in most cases''.

Table 2: Identification of problems faced by rice farmers (n = 240)

S/N	Factor	Frequency	Percentage
1.	**Scarcity of improved varieties:**		
	Mild	0	0.0.
	Severe	54	22.5
	Very severe	186	77.5
2.	**High cost of agrochemicals:**		
	Mild	0	0.0
	Severs	42	17.5
	Very severe	198	82.5
3.	**Pests/rodents attack:**		
	Mild	23	9.6
	Severe	87	36.3
	Very severe	130	54.1
4.	**Lack of storage/processing system**:		
	Mild	14	5.8
	Severe	63	26.3
	Very severe	163	67.9
5	**Poor access road:**		
	Mild	0	0.0
	Severe	59	24.6
	Very severe	181	75.4
6.	**Low yield**:		
	Mild	160	66.7
	Severe	49	20.4
	Very severe	31	12.9
7.	**Changes in weather/climate:**		
	Mild	0	0.0
	Severe	63	26.3
	Very severe	177	73.7
8.	**Disease attack**:		
	Mild	149	62.1
	Severe	81	33.8
	Very severe	10	4.1
9.	**High cost of land:**		
	Mild	30	12.5
	Severe	87	36.3
	Very severe	123	51.2
10.	**High labor cost:**		
	Mild	0	0.0
	Severe	70	29.2
	Very severe	170	70.8
11.	**Poor access to credit facilities**		
	Mild	0	0.0
	Severe	30	12.5
	Very severe	210	87.5

12.	**Lack of government support:**		
	Mild	0	0.0
	Severe	75	31.2
	Very severe	165	68.8
13.	**Poor extension service:**		
	Mild	143	59.6
	Severe	64	26.7
	Very severe	33	13.7
14.	**Poor marketing system:**		
	Mild	33	13.8
	Severe	68	28.3
	Very severe	139	57.9

Source: Field survey, 2019.

Profitability analyses of rice production
This section examined the profitability analyses of rice production in the study area. To determine the profit level, attempts were made to estimate the cost and return from rice farming. The gross margin and gross profit ratio associated with rice production were estimated. Here, both variable and fixed costs were considered and calculated. The variable costs include cost of seeds, fertilizer, pesticides, bags, labour as well as fixed costs were used. Returns were calculated based on average price that farmers received per kg of rice.
The farm enterprise budgeting analysis revealed the costs and returns of rice production to be profitable with a gross margin of ₦383, 242.00 and net farm income of ₦363, 242.00**.** The benefit- cost ratio was calculated to be 3.1 which indicates that rice farmers are selling their rice produce at a relatively high profit that is an estimated profit of ₦1 for each ₦3 invested. According to Madu and Aniobi (2018), a high gross profit ratio is an indication that the farmers are selling their produce at high profit level. Hence, the farmer are expected to have sufficient funds to pay for operating expenses such as wages, utilities and rent while having high turnover in the study area. This finding is in consonance with the finding of Ekpe and Alimba (2013), where they reported that rice production in Ebonyi State has positive gross margin because total revenue is far higher than total variable cost.

Table 3:Enterprise budget for one hectare of rice farm   in Ebonyi North Agric. Zone

S/N	Items	Unit	Quantity	Unit price (₦)	Total amount (₦)
1.	**Revenue:**				
	a.Paddy	Metric tons	4.9	109.6	537,040
	Total Revenue (TR)	-	-	-	**537,040**
2.	**Variable Cost:**				
	a. Improved rice seed	Kg	50	350	17,500
	B .Herbicides	Litres	6	1,200	7,200
	c. Fertilizers	Kg	50 x 6	150	45,000
	d. Pesticides	Litres	1	1,200	1,200
	e. Labour	Mandays	-	-	82,898
	f. Other expenses	-	-	-	-
	Total Variable Cost (TVC)	-	-	-	**153,798**
3.	**Fixed Cost:**				
	a.Land rent	Ha	-	20,000	20,000
	b.Depreciation	-	-	-	-
	Total Fixed Cost (TFC)	-	-	-	**20,000**
4.	**Total Cost (TC)**	-	-	-	**173,798**

Source: Field Survey, 2019

Where:
Total Cost (TC) = Total Variable Cost (TVC) + Total Fixed Cost (TFC)
$$= ₦i53,798.00 + ₦20,000.00$$
$$= ₦173,798.00$$
Gross Margin (GM) = Total Revenue (TR) – Total Variable Cost (TVC)
$$= ₦537,040.00 -- ₦153,798.00$$
$$= ₦383,242.00$$
Net Farm Income (NFI)= Total Revenue (TR) – Total Cost (TC)
$$= ₦537,040.00 -- ₦173,798.00$$
$$= ₦363,242.00$$

Benefit – Cost Ratio (BCR) = Total Revenue (TR) / Total Cost (TC)
     =₦537,040.00 / ₦173,798.00
     = 3.1

CONCLUSION AND RECOMMENDATIONS

Rice production is a profitable farm enterprise in Ebonyi North Agricultural Zone of Ebonyi state, Nigeria. The promotion of rice production among farmers in the study area will increase availability and affordability of rice as an essential food commodity, enhance the income generation of rice farmers; and improve food security in Ebonyi state and Nigeria at large. Government should therefore come to the aid of the rice farmers through timely provision of improved varieties, agrochemicals, credit facilities, storage and processing equipment and access rural roads so as to boost rice productivity and profitability in the study area. Besides, extension agents should adequately enlighten farmers on the benefits of using improved varieties of rice and its production technologies.

REFERENCES

Abdullahi, A. 2012. Comparative Economic Analysis of Rice Production by Adopter and non-Adopter of improved varieties of rice among farmers in Paikoro LGA of Niger state. Nigeria J. Basic and Appl. Sci.. 20(2): 146–151.

Duvvuru, N. R. and Motkuri, V. 2013. Declining Labour Use in Agriculture: A Case of Rice Cultivation in Andhra Pradesh. Paper No. 49204 Available at www.mpra.ub.unimuenchen.de.

Ekpe, I.I. and Alimba, J.O. 2013. Economics of Rice Production in Ebonyi State South Nigeria, International Journal of Food, Agriculture and Veterinary Sciences ISSN: 2277-209X (Online) An Online International Journal Available at http://www.cibtech.org/jfav.htm; 3 (2): 77–81.

Epundu M.O.(2010). Economic analysis of rice production and marketing in Uzo-Uwani Local Government Area of Enugu State, MSc thesis, University of Nigeria, Nsukka, Nigeria, 2010

FMARD, (2012) Federal Ministry of Agriculture and Rural Development. Rice transformation project proposal. FMARD, Abuja, Nigeria, 2012.

Madu, A.B. &Aniobi ,U. J. (2018) Profitability analysis of paddy production: A case of agricultural zone 1, Niger State Nigeria. Journal of Bangladesh Agricultural University; 16 (1): 88–92.

National Population Commission (2006). Nigeria national population census result. NPC, Abuja.

Yakubu, S.(2002). Economic Analysis of Groundnut Production in Azare Municipal, Katagum L.G.A of Bauchi State. An unpublished B. Tech. Project of Agricultural Economics and Extension Programme ATBU Bauchi: 62.