

Analysis of Socio-Economic Factors and Profitability of Rice Production among Smallscale Farmers in Ebonyi State

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Abstract: This study investigated on socio-economic factors and profitability of rice production among smallscale farmers in Ebonyi state. Multi-stage random sampling technique was employed to select a total of 120 rice farmers. The primary data were collected for the study through structured questionnaire and interview schedule organized for illiterate farmers in the study area. Analytical tool adopted for the study include; frequency, percentages, and multiple regression analysis and factor analysis. The result of analysis showed that majority (58.3%) of the farmers in the study area were females while 41.7% were males. The age of the respondents between 21-30 years with 41.7% ranked the highest, while those greater than 51 years with 4.2% was the least. Majority (62.5%) of the respondents were married while 4.2% were single. Result on household size shows that greater proportion 29.2% of the respondents have the highest frequency at the range of 11-15 persons while 20.8% were least. The result of educational level shows that majority (41.2%) completed primary school while the least of the respondents (12.5%) had tertiary education. The study further indicates that most (45%) of the respondents had reasonable years of experience ranging between 16 and above in the study area. The research work also showed that majority (41.7%) of the respondents were farmers and earned between 31,000-4,0000 naira per annual. The study also shows that they sourced their information majority from ADPs, ministry of Agriculture, local government, neighbours, extension agent, Fadama, Radio/TV and cooperative society. In the result of multiple regression analysis, it was observed that coefficient of determination was 87% and all the variables used were positively signed and some statistically insignificant such as age, marital status, household size, educational level, farming experience and annual income. The statistically significant ones were occupation, gender and farm size. The major constraints limiting the rice production were identified as economic problem, infrastructural issue and unfavourable government policies. Based on the findings of the research work, some relevant recommendations were made; they include; extension agents should be trained and empowered to educate farmers on how to process rice to different product, Government should work with existing social organization and involve them in distribution of necessary inputs for rice production and timely provision of necessary farm inputs to enhance rice production.

Keywords: Socio-Economic, Factors, Profitability, Rice Production, Smallscale, Farmers, Ebonyi State.

I. Introduction

Rice (*Oryza sativa*) is the major staple food for half of the human race (Imolehin and Wada, 2000). It is the staple food of more than 60 percent of the world's population (Imolehin and Wada, 2000). According to WARDA (1996), rice has become a staple food of considerable strategic importance in many rapidly growing African cities where its consumption among urban poor households has increased substantially. In Nigeria rice has become a major staple food in most homes today and unfortunately domestic production of this grain has not met the demand leading to food shortages. Globally, it is an important food crop which is increasingly preferred over many traditional foods such as sorghum, millet and most roots and tuber crops such as yam, cassava, etc. Rice ranks third after wheat and maize in terms of worldwide production (Imolehin and Wada, 2000). Rice has the potential to improve nutrition, boost food security, foster rural development and sustain land mass. World rice consumption rate has been increasing due to increase in population strength and importance attached to it as a staple food. Between the year 1961-2002, per capital consumption of rice in the world increased by 40%. It is perhaps the world's most important food crop being the staple food of over 50 percent of the world's population, particularly of Indian, china, and a number of other countries in Africa and Asia. According to Akande, (2003) the demand for rice (*Oryza sativa*) has been increasing at much faster rate in Nigeria than in other West African countries since the mid 1970s. For example, Nigeria's per-capital rice consumption level has grown significantly at 7.3% per annum, rising from 18kg in the 1980s to 22kg in 1990s.

Although rice production in Nigeria has boomed over the years, there has been in a considerable lag between production and demand level with imports making up the shortfall (Akande, 2003). As per the Nigerian agricultural policy document (Nigeria, 1989), specific objective of agricultural sector policies is the attainment of self-sufficiency in basic food commodities with particular reference to those food commodities which consume considerable shares of Nigeria's foreign exchange and which can be produced

locally within the country. In this regard therefore, Nigeria will aim to be more than self-sufficient in the production of all cereals except wheat, most roots and tubers, most grain legumes, most oil seeds and nuts, most vegetables and fruits and most vegetable oils (Akande, 2003). Going by this policy scenario therefore production of rice in Nigeria is bound to expand for several reasons; rice import consumes considerable share of Nigeria's foreign exchange, the proportion of rice in the food basket of Nigerians has continued to raise and Nigeria has the capacity for the expansion of rice production. In the words of Akande (2003) he opined that the rice cropping system and the post harvest services in Nigeria encompass a wide range of agricultural activities ranging from land clearing, seed bed preparation, broad casting, fertilizer application, weeding and bird scaring. Others includes harvesting, threshing, parboiling, drying, winnowing, bagging and marketing and distribution. These activities are largely executed manually and women and children the very vulnerable segments of the society are largely involved. Rice production expansion in Nigeria is therefore bound to reduce drastically the foreign exchange spending on rice importation and more importantly it could lead to the transfer of money into hands of the very vulnerable group of the Nigeria economy. Presently, Nigerian rice sub-sector is dominated by weak and inefficient producer-market linkages due to poor infrastructure including lack of improved processing facilities, low rice productivity, poor post-harvest handling and storage, expensive and poor access to inputs (High quality seed, fertilizing and crop protection products), inadequate market information, lack of transparency among players, low capacity to meet quality standards, and limited efficiency distribution networks. This has declined the rice productivity and low income for the rice farmers in Nigeria, especially in Ebonyi State. In Ebonyi State, it has resulted in massive loss of man power through the abandonment of the farmers and the migration of rural youths to cities in search of white collar jobs.

However, there seems to exist a gap in knowledge on the socio-economic factors influencing rice production in Ebonyi State which has been also declining the income level of the farmers. Both Okoruwa and Ogundele (2008) have noted that rice farmers in Ebonyi State are not getting maximum returns from the resources committed into their enterprises; leading to a decline in per capita food production. This situation manifests in low output per area which no doubt lead to low profitability. This study therefore aims at examining the economic analysis of rice production in Ebonyi State.

II. Objectives Of The Study

The broad objective of this study is to analyze the socio-economic factors and profitability of rice production among small-scale farmers in Ebonyi state. Specifically, the specific objectives are, to;

- i. describe the socio-economic characteristics of rice farmers in Ebonyi State.
- ii. identify source of production-related information to the rice farmers.
- iii. analyze cost and returns in rice production in the study area.
- iv. analyze the effect of socio-economic characteristics of rice farmers on their output in the study area.
- vi. identify constraints to rice production in the study area.

III. Methodology

3.1 Study Area

The Study will be conducted in Ebonyi State of Nigeria. Ebonyi State is divided into three(3) agro-political zones, namely: Ebonyi South, Consisting of Five (5) Local government Areas while Ebonyi Central and North zones each has four Local Government Areas. Ebonyi State have a land mass of approximately 5,932 square kilometers lying between latitude $7^{\circ} 30'E$, and $8^{\circ} 30'E$, and Longitude $5^{\circ} 40'N$ and $6^{\circ} 40'N$ and $6^{\circ} 45'N$, with a population of about 2.1 Million (NPC, 2007) people of which 85 percent reside in rural areas.

Sampling Technique

A combination of multi-stage and purposive sampling techniques were used to select the respondents for the study. These were conducted in the following manner.

Stage 1: The first stage of the level was randomly sampling of one (1) local government areas from each of the agricultural zone of Ebonyi State. This gave a total of three (3) Local Government Area to be sampled.

Stage II: At the second stage, two autonomous communities were randomly sampled from each of the three (3) local Government Areas. This gave a total of six (6). Finally, 10 rice farmers were administered the questionnaires for the study. That is a total of 120 respondents were sampled.

3.3 Data Collection

Primary data was collected for the study. Primary data were collected using questionnaire that was administered on 120 rice farmers.

11-15	35	29.2
Above 16	30	25.00
Educational qualification		
No formal education	35	29.2
Primary school	50	41.7
Secondary school	20	16.7
Tertiary institution	15	12.5
Farming experience		
1-5 yrs	30	20.8
6-10yrs	15	12.5
11-15yrs	20	16.7
16-20 yrs	55	45.8
Primary occupation		
Farming	50	41.7
Civil service	36	30
Trading	16	13.3
Artisans	18	15
Farm size		
0.5-1.00ha	20	16.7
1.5-2.00ha	35	29.2
2.5-3ha	40	33.3
3.5-4ha	15	12.5
4.5 & Above	5	4.2
Annual income		
≤20,000	15	12.5
21000-30,000	30	25.00
31,000-40,000	47	39.2
41,000-50,000	22	18.3
51,000-above	6	5

Source: survey-field, 2014

Result of the analysis indicated that age of the respondents between 21-30 years(41-7%) ranked the highest, while those greater than 51 years (4.2%) was the least. This means that most of the farmers were within the age of active work force. The result of the analysis on gender shows that there were more females (58.3%) than males (41.67%) who engaged in rice production in the study area. The implication is that females are more involve in rice production more than males. Result on the marital status shows that greater proportion 62.5% of the respondents were married while (4.2%) were single. This implies that married people were more involved in rice production than other categories of different marital status. This could be because married men and women have greater household responsibilities and seek various ways to feed their families. Result on household size shows that greater proportion (29.2%) of the total respondents has the highest household size between 11-15 persons. The household size of most of the respondents was high due to polygamy of most farmers. Members of the farmers' household contribute immensely to family labour supply. Result of educational qualification showed that majority (41.7%) had no formal education while the least (12.5%) had obtained tertiary education. This implies that most of the respondents had low educational qualification.

The result also indicated that most of the farmers in the study area have reasonable years of farming experience that ranged from 16-20years (45.8%). But, the least of the respondents (12.5%) had farming experience of above 20 years. The results showed that majority (41.7%) of the respondents were full time farmers while the number of civil servant were 30% of total. Meanwhile, the traders and Artisans had 13.3% and 15% respectively. The result of the socio-economic characteristics of the respondents shown in table (1) indicated that majority (33.3%) had farm size that ranged between 2.5-3hectares in scattered plots. But few of the respondents (4.2%) had farm size greater than 4 hectares. The result obtained in table I had showed that most of the respondents (39.2%) earned between ₦31, 000- 40, 000 while the least (5%) earned above ₦51,000. This implies that the farmers earned low annual farm income which could be as a result of constraints that associated with rice farming such as high cost of fertilizer, pest and disease, high cost of transportation, lack of improved seed varieties.

4.2 Regression Analysis of the Effect of Socio- economic Characteristics of the Respondents on their Output of Rice production.

Variable symbol	Variable name	Regression coefficient	Std error	t-value	Sign
	Constant	0.725	1.277	0.568	0.571 ^{NS}
X ₁	Age	0.091	0.159	0.575	0.566 ^{NS}
X ₂	Gender	0.423	0.221	1.913	0.10***
X ₃	Marital status	0.267	0.102	-2.621	0.72 ^{NS}
X ₄	Household size	0.402	0.221	-1.820	0.506 ^{NS}

X ₅	Educational level	0.073	0.109	-0.668	0.406 ^{NS}
X ₆	Farming Experience	0.227	0.272	0.834	0.732 ^{NS}
X ₇	Occupation	0.071	0.207	0.344	0.00*
X ₈	Farm size	0.671	0.117	5.756	0.00*
X ₉	Annual income	0.017	0.210	0.080	0.937 ^{NS}

R²(Square) value = 0.890 x 100 = 89%

Adjusted R² = 0.823

Standard error of the estimate = 72.65353

Durbin - Watson -1.815

Source: Field Survey, 2014

A multiple regression model was adopted for the analysis. Based on the analysis, the coefficients of determination (R²) was 89%. This shows that about 89% of the variation in the dependent variable Y (output) was influenced by the combined effects of the independent variable (X₁-X₉), while the remaining 11% of the variation in the dependent variable (Y), was due to some other important variables that were not included in the regression model. This R² value is high enough to justify the good fit of regression model, since explanatory variables exert effects on the explained variables. Also, adjusted R₂ value was 0.823 (82.3%) which is very close in the numerical value to R₂ square (0.89). This closeness in numerical value implies that the explanatory power of regression model adopted was not exaggerated.

The coefficient of age (X₁) was positively signed and not statistically significant. This implies that positive relationship exists between the age of the farmers and the total output of rice production in the area. The situation indicates that older farmers are more skillful in the rice production, hence the a priori expectation was met. The coefficient of gender (X₂) was positively signed and statistically insignificant beyond 10% level of significance. This means that there is a positive relationship exists between gender (X₂) and output of rice farmers. The a priori expectation was met. The coefficient of marital status (X₃) was positively signed and was statistically significant beyond 10% level of significant. This indicated that marital stated was positively related to the output of rice production. The apriori expectation was met. This is because married farmers with their households are usually better off to adopt labour intensive farming technologies. The coefficient of household size(x₄) bore a positive coefficient which was statistically significant beyond level of significance. This indicates that household size have a positive influence on the output of rice farmers in the study area. The implication is that members of the household contribute significantly to family labour supply which leads to increase in rice yield. This is in line with the result of the work done by Okorie et al (2011), who noted that farmers with increased household size obtained higher yield due to family labour supply. This reduces the cost of production since family labour is not paid for. The educational qualification of rice farmers bore positive signed coefficient and was not statistically significant. The positive relationship indicates that the higher the level of education of the farmers, the higher their yield in rice production. This is true because educated farmers are intelligent and calculative in utilization of available resources and are able to adopt innovation on rice products. Unlike uneducated farmers who has low adoption level. Furthermore, it also implies that better education and more farming experience improve awareness of potential benefits and willingness to participate in local natural resource management and conservation activities. However, the farming experience (X₆) of the respondents also showed positive coefficient and statistically insignificant. This means that increase in the years of farming experience led to a corresponding increase in the output of the farmers. This is true because farmers who have higher farming experience are likely to be more knowledge in the combination of resources. This is in line with the apriori expectation because rice farmers with high level of farming experience obtained increased yield due to higher efficiency in resource use. They are technically, economically and allocatively more efficient than others who have low level of farming experience. The result of analysis indicated that coefficient of the occupation (X₇) was highly positive and statistically insignificant. This indicates positive relationship which means that rice farmers is in other occupation generated extra income to support rice production, leading to increase in yield. The regression coefficient of the farm size (X₈) was positively signed and statistically significant at 1% level of significant related to the output of rice farmers. This implies that there a positive relationship existing between the farm size and output of rice farmers. From the table (5), the result of the analysis bore positively signed and was not statistically significant. This implies that there is a positive relationship existing between annual income (x₉) and output of the rice farmers in the study area. The apriori expectation was met. This is true because rice farmers with higher income obtained higher yield due to their ability to acquire input resources used in rice production, unfavorable government policy, lack of extension services, lack of farmers training etc.

4.3 Source of Information to Rice Farmers

Variables	Frequency	Percentage
ADPs	112	26.7
Ministry of Agriculture	102	24.3
FADAMA	30	7.1
Local Government	67	15.9
Extension Agent	40	9
Co-operative society	10	2
Neighbour	50	11.9
Radio/TV	9	2.1

Source: field survey 2014.

Multiple responses recorded*

From table (4.3) Majorly (26.7%) of the respondents sourced information on improved seed varieties, fertilizer, pesticides, herbicides, and other farm inputs from ADPs while others sourced information from ministry of agriculture (24.3%) local Government (15%), Neighbours (11.9%), extension agent (9%), FADAMA (7.1%) cooperative society (2.0%) and Radio/TV (2.1%) in the study area. The implication of this could be that the strategic approaches used by ADPs in disseminating the information about improved rice varieties are understandable and affordable to the farmers.

4.5 Cost and Returns in Rice Production.

	Materials Used	Kg	Qty	Cost/per unit	Total amount
A.	Variable cost				
	Rice seed cost	Kg	14	3500	49000
	Fertilize cost	Kg	2	5000	10,000
	pesticides cost	Litres	2	1200	2,400
	Herbicides	Litres	2	1300	2600
	Planting	Manday	-	1800	1800
	Land cleaning	Manday	-	3500	3500
	Harvest cost	N	-	6500	6500
	Processing cost	N	-	2850	2850
	Milling cost	N	-	3560	3560
	Transportation cost	N	-	4800	4800
	Total variable cost				87010
B.	Fixed cost				
	Cost of land	Hectares	2	10,000	20,000
	Hoe	-	4	500	6500
	Cutlass	-	5	1500	7500
	Baskets	-	20	300	6000
	Knapsack sprayer	Litre	1	7300	7300
	Total fixed cost				47300
C.	Revenue				
	76 bags	Kg		4500	342,000
	Husks/empty bags	-			33560
	Total revenue				375,560

Source: field survey, 2014.

The table revealed that the gross margin analysis (cost and returns) from rice production in Ebonyi State. It further revealed that the total variable cost was ₦87,010 while total fixed cost was ₦47300. Meanwhile total revenue and profit were ₦375,560 and ₦241250 respectively; therefore, this is a sure sign that the rice business outfit in question is profitable enough to keep the farmer owner in further production. This implies that the rice farming is highly profitable since the total revenue has significantly out weighed the total variable cost. The implication is that since the rice business is highly profitable, therefore it has a significant contribution to the national gross domestic product and income of the farmer as whole thereby uplifting the general standard of living. This conformed with findings of Ekpe and Alimba (2013) rice production in Ebonyi State has positive gross margin as shown by the study because Total Revenue (TR) is far more than Total Variable cost (TVC). The profitability of rice enterprise and farmers income is expected to increase significantly if more land is put under rice production.

4.6 Constraints Limiting Rice Production in the Study Area. Varimax rotated Factor Matrix on Constraints Limiting rice Production in the Study Area.

Variable code	Variable names	Factor 1 Economic problem	Factor 2 Infrastructural relationship	Factor 3 Economic government & policies problem
Vo1	Inadequate capital	0.499	-0.078	-0.428
Vo2	Problems of pests and disease	0.161	0.038	-0.049
Vo3	High cost of transportation	0.512	0.068	-0.439
Vo4	High cost of labour	0.616	0.219	0.430
Vo5	Poor marketing outlet	-0.403	0.621	-0.140
Vo6	Inadequate supply of farm input	-0.008	0.593	0.134
Vo7	High cost of agro-chemicals	-0.382	0.142	0.463
Vo8	Land tenure system issue	-0.237	0.059	0.034
Vo9	High cost of fertilizer	0.821	0.134	-0.051
Vo10	Poor storage facilities	0.063	-0.805	0.069
Vo11	Unfavorable government policies	0.069	0.260	0.818

Source: Field Survey, 2014.

Table above shows the varimax-rotated constraints limiting rice production in the study area. The data obtained in the based on the responses of the respondents. In this regards, the variable were grouped into three(3) major constraint as constraints 1 (Economic problems), constraint 2 (infrastructural problems) and constraint 3 (Economic and Government polices). Constraint I was named due to the variable that loaded high under it. They include: inadequate capital (0.499), high cost of transportation (0.512); high cost of labour (0.616), high cost of agro chemical (0.382) and high cost of fertilizer (0.821). After critical consideration, constraint 2 was named infrastructural problem because the variable that loaded high under it related to infrastructural problems. These include: poor market outlet (0.621), inadequate supply farm input (0.593), and poor storage facilities (0.805). Under constraints 3, the identified constraining variables were; inadequate capital (0.428), high cost of transportation (0.439), high cost of labour (0.430) and unfavorable government polices (0.818).

V. Conclusion

The study showed that rice is one of the most common crops cultivated by the small holder farmers especially females in the study area. The farmers posses moderate household size and small hectares of farm land. The result further identified that the rice farmers sourced information from ADPs and ministry of agriculture. The result of multiple regression analysis showed that R² -square was 89% and all variables used were positively signed and were significant. Factor analysis was utilized to determine the constraints limiting the rice production and it was observed that economic issue, infrastructural problem and government policies issues were found as the major constraints affecting rice production in Ebonyi State. The research work also indicated that the business of rice production in the study area was highly profitable.

VI. Recommendations

Based on the findings of this study, the following recommendations were made;

1. Improved variety of rice as well as improved technology package of practice involved in rice production should be made accessible to farmers by governments and her extension agents.
2. Extension agent should be trained and empowered to educate farmers on how to produce different varieties of rice.
3. Adequate infrastructural facilities should be provided by NGOs and state government including rural feeder roads to enable farmers transport their rice to area where they can be sold at economic cost.
4. Government should work with existing social organization and involve them in distribution of necessary inputs for rice production.
5. Timely provision of necessary farm inputs to enhance rice production.

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