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Factors influencing local production of rice (Oryza sativa) in Abakiliki L. G. A. of Ebonyi State, Nigeria

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Abstract

This study in Abakiliki L.G.A of Ebonyi State examined factors influencing the output of local rice. A research survey design was used for the study and fifty (50) local rice farmers were randomly selected from 17 different communities in Abakaliki LGA. Descriptive statistics and multiple regression were employed in the data analysis. Results showed that most of the rice farmers sampled were of their active age with an average of 35 years. The respondents possessed one educational qualification or the other. The Size of the farm, labour input, capital inputs, and cost of seeds exerted significant influence in explaining the variations in the quantity of local rice produced. The R2 (0.766), showed that 76.6% of the variations in the output of local rice were captured by the explanatory variables. It is recommended that local rice farmers increase their small farm sizes either through the acquisition of more lands directly or through government efforts at a fee. Furthermore, since labour input significantly influenced the output of Local rice it is recommended that skilled labour be attracted into local rice production through increased remuneration of labour in rice production. Capital inputs should be increased in the study area probably through credit liberalization or skewing of credit supply in favour of local rice production to enable the farmers to hire skilled labour needed to boost rice output.

Keywords: Abakaliki, Factors influencing, Local rice, Nigeria, Production

1. Introduction

Rice is a major food crop that is produced and remains widely consumed in Nigeria. It is also an economically essential food crop in many developing countries where consumption of the crop has increased tremendously. The Minister of Agriculture and Rural Development in Nigeria noted in November 2016, that Nigeria's rice output stood at 3.5 million metric tons, while domestic consumption stood at seven million metric tons. This implies that Nigeria produced only 50% of the domestic rice requirement leading to food insecurity (Enwerem & Ohajianya, 2013). Therefore,

importation of this very important staple crop to make up for the shortfalls in output became an inevitable escape route. Records from the National Bureau of Statistics (2012) showed that Nigeria spent ₦56.91 billion on rice importation in 2012. Rice importation is an unnecessary drain of scarce foreign exchange given the available human and material resources in the country for rice production. These imports exert avoidable pressure on the Naira which negatively impacts the economy. Loss of foreign exchange earnings, jobs, and income is a result of the cost accrued from these imports.

The Ebonyi state of Nigeria possesses large fertile land and is notable for the production of a variety of food crops and is popular in the production of a brand of local rice called "Abakaliki rice". The quest to increase local rice output in Nigeria led to various interventions by the successive Nigerian government through increases in rice import tariffs to an outright ban on its importation in order to encourage local production. Some governmental programmes and institutions geared toward self-sufficiency in food crop production have been put in place by the Federal Government aimed at reducing the rice-demand supply gap by stimulating surplus harvest for export to other countries. The aim of the Nigerian government to increase the output and encourage consumption of local rice had not been actualized as the importation of rice remained unabated. The recent closure of Nigeria's land borders was partly geared towards reducing the smuggling of this important staple food crop.

Taking into account the economic value and high demand for rice in the country, smallholder rice farmers are expected to leverage these policy efforts to bridge the rice supply-demand gap in local rice and increase their farm profits. Identification of the factors influencing farmer's local rice output, therefore, becomes compelling.

2. Statement of the problem

Rice is a traditional crop grown in Nigeria; however local output is limited while internal demand for rice is growing. Rice has become an increasingly important crop in Africa, with imports into the continent accounting for more than a third of world trade in rice (FAO, 2006). The Nigerian Customs Service placed a ban on rice importation in order to shore up the level of local rice output. With restrictions on the importation of rice in Nigeria, the locus of rice consumption has shifted from the foreign to the indigenous rice and placed a lot of burden on domestic rice farmers. The foreign exchange conserved from importing rice could be used to provide infrastructure in both rural and urban areas.

In spite of the multiplicity of Federal Government policies in the rice sector, output has not matched the growing domestic demand for rice. Little attention has been placed on the examination of the factors influencing the output of indigenous rice particularly in the Ebonyi State of Nigeria. It has therefore become compelling and imperative to determine the factors influencing the output of local rice in Abakaliki LGA of Ebonyi State ostensibly to proffer solutions to the existing gap between the supply and demand. The major focus of this study includes the determination of the socio-economic attributes of rice farmers and determining the factors that influence rice output.

3. Research methodology

Abakaliki is the capital of Ebonyi State and the largest town in the state. The people of Abakaliki are predominantly farmers who took advantage of the abundant fertile lands for agricultural production. Abakaliki Local Government is a major rice-producing area in Ebonyi State. There are 17 major areas in Abakaliki where local rice is produced. These are Ntezi Aba, Abakpa, Afikpo Rd, Enugu-Ogoja Exp. Rd, Enugu Exp Rd, Enugu Express, Enugu-Ogoja Express, G.R.A, Kpiri-kpiri, Mbukobe, Ndiaguo, New layout, Abakaliki Rd, Ogbaga Rd, Ogoja Rd, Pressco, Udensi.

The population of the study comprised all rice farmers in the State. Primary data for this study were generated through the selection of three rice farmers by simple random sampling from each of the seventeen major rice-producing communities. This gave a total sample size of fifty-one rice farmers. Questionnaires that were structured to elicit the requisite response were administered to the respondents. In addition, interview schedules and field observations were used in generating the primary data for the study. A total of 51 questionnaires were administered however 50 copies were retrieved.

4. Data analysis

Data were analyzed with the aid of percentages, frequency tables, and others. as well as multiple regression models. Descriptive statistical tools such as frequency distribution and percentages were used to achieve the first objective while regression analysis was used to achieve the second objective. The implicit form of the model specified is as follows:

$Q = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, e_i)$

Where Q = Rice output in kg

X_1= Size of farm (ha)

X_2= Labour (man days)

X_3= Capital inputs (₦)

X_4= Age (Years)

X_5= House hold size (number)

X_6= Education Level (years)

X_7= Farming experience (years)

X_8= Expenditure on seeds (₦)

e_i = the disturbance

5. Results and discussions

5.1. Socio-economic attributes of Abakaliki rice producers

The distribution of Abakaliki rice farmers according to socio-economic attributes are hereby presented.

Table 1: Distribution of respondents according to their Socio-economic attributes

Sex	Frequency	(%)
Male	36	72.0
Female	14	28.0
Total	50	100

Age range	Frequency	Percentage (%)
20-25 years	14	28
26-31 years	16	32
32-37 years	10	20
38-43 years	5	10
44- 49	2	4
50- 55	2	4
56- 61	1	2
Total	50	100
Status of marriage	**Frequency**	**(%)**
Single	11	22.0
Married	39	78.0
Total	50	100
Major Occupation	**Frequency**	**Percentage (%)**
Rice Farming	49	98.0
Trading	1	2.0
Total	50	100
Educational Level	**Frequency**	**(%)**
Non formal	6	12.0
Primary	14	28.0
Secondary	29	58.0
Tertiary	1	2.0
Total	50	100
House hold size	**Frequency**	**(%)**
1-5	17	34.0
6-10	18	36.0
11-15	12	24.0
16-20	2	4.0
21-25	1	2.0
Total	50	100

Survey data, 2017

Table 1 showed that 72.0% of the Abakaliki rice farmers were males while 28.0% were females. The result disagrees with the findings of Ogaraku and Ogbonna (2016) who posited that there were more women (58.1%) in rice production. The majority (36%) were within the age bracket of 30-39 years which implies that rice farmers who were young and active can contribute immensely to efficient rice production and supply. Ogaraku and Ogbonna (2016) pointed out that older people dominated the rice farming enterprise due to the youth's occupational migration to do white-collar jobs. But this is in contrast with the findings of this research as the result has shown that youths in the study area participated actively in rice farming.

Results of data analysis on marital status showed that 22% of the Abakaliki rice farmers were single while 78% were married. This is in agreement with Horna, Smale and Oppen (2005) who opined that most rice farmers were married. Indicating the possibility of having many children,

which may lead to increased home consumption leading to food insecurity if not backed up by an increase in production (Muhammad et al., 2015). The occupational distribution of the respondents showed that 98% of the Abakaliki rice farmers have rice farming as their major occupation and only a portion (2%) have traded as a major occupation and rice farming as a subsidiary meaning that the farmers engaged in rice production as their major means of livelihood.

This study also showed that only 12% of the rice farmers have no formal education, 28% have primary education as their highest educational level, 58% possessed secondary education, and just 2% attained the level of tertiary education. This means that the majority of the rice farmers have one educational qualification or the other and only a fraction of the rice farmers have no formal education at all. This agrees with Muhammad, *et.al*. (2015) who posited that two-thirds of rice farmers were well educated suggestive of the fact that Abakaliki rice farmers' level of education could lead to a positive attitude towards the use of modern agricultural practices which may improve their food security status. Education enhances the farmer's decision-making ability and helps the farmer to acquire farm technical know-how and increases the innovativeness of the farmer. This result is in agreement with the findings of Hyuha (2006) who stated that education was necessary to increase the profit efficiency of rice farmers, thereby increasing the supply of rice.

Results of data analysis on household size showed that 34% of the Abakaliki rice farmers have a household size of 1-5 persons, 36% have 6-10 people, 24% have 11-15 persons, 4% have 16-20 persons and 2% have house hold the size of 21-25 persons. This frequency distribution is indicative of the fact that the bulk of the rice farmers had household sizes of between 6-10 persons. This result agrees with the findings of Ogaraku and Ogbonna (2016) who noted that most of the rice farmers had family sizes of 6-10 persons. The purpose of maintaining a large household size was to ensure a readily available supply of family labour for rice production activities. Muhammad *et al*. (2015) pointed out that 34.28% of the farmers in the village have a household size of nine (9) and above. Household size could have great implications for labour supply for farm work and also food security.

5.2. Determinants of output of rice in Abakiliki, L.G.A. of Ebonyi State, Nigeria

Table 2: Factors determining the output of rice in the study area

Independent Variables	Linear	Semi- Log	Cobb-Douglas	Exponential
Constant	126.8	33711.7	4.07	2.79
	(0.5999)	(8.32)***	(27.37)***	(45.51)***
Farm size	12090.97	14268.30	0.98	0.13
	(32.42) ***	(11.73)***	(22.07)***	(1.20)
Labour input	-2.98	-8988.73	0.004	0.01
	(-0.40)	(-5.41)***	(0.06)	(7.75)***
Capital input	-0.045	1350.61	0.007	0.00
	(-0.09)	(2.03)**	(0.30)	(-0.95)
Age	-4.23	-1960.64	-0.015	0.001
	(-0.59)	(-1.20)	(-0.24)	(0.71)
Household size	4.32	649.08	0.003	-0.002

	(0.41)	(1.22)	(0.18)	(-0.80)
Educational Level	9.44	382.89	0.02	0.000
	(0.88)	(0.59)	(0.84)	(0.14)
Farming experience	-2.45	354.60	-0.011	-0.002
	(-0.41)	(0.84)	(-0.70)	(-1.27)
Expenditure on seeds	-0.004	-2208.26	-0.001	4.563E-5
	(-0.15)	(-12.04) ***	(-0.21)	(6.65)***
R^2	0.996	0.766	0.995	0.962
F ratio	1.307E3	144.09	952.84	130.16

Levels of significance: ** = 5%, *** = 1%, t-ratios are presented in parenthesis.

Survey data, 2017

From Table 2 above, both the linear and the double log models produced one statistically significant explanatory variable each at 1% and 5% levels of probability. The exponential function produced two statistically significant explanatory variables at 1% and 5% levels of probability. The semi-log produced four statistically significant explanatory variables at 1% and 5% levels. While the R^2 for the linear model was 0.996, that of semi-log, and Cobb-Douglas models were 0.766 and 0.995 respectively. The exponential model on the other hand had an R^2 of 0.962. The semi-log function becomes the lead equation.

Regression results, of the semi-log function, showed that sizes of the farm, capital, household sizes, educational levels, and experiences in farming possessed the expected a priori positive signs. This means that any increase in farm sizes, capital input, household sizes, levels of education, and farming experience greatens the output and gross income of Abakiliki rice farmers in the Ebonyi State of Nigeria.

This finding is consistent with Kadiri *et al.* (2014) in Delta, Nigeria. The positive correlation between household sizes and the output of local rice in Abakiliki L.G.A. could be because of the availability of family labour needed for the various operations on the farm. Therefore, an increase in household sizes would *ceteris paribus* enlarge the output of rice in the area study.

The level of education is positively correlated to output because the educational attainment of a farmer raises his productivity and increases his capacity to comprehend and analyze information on new technologies being disseminated through extension services. According to Imonikhe (2010), education enhances farmers' mental acumen and capacity to make meaningful management decisions; therefore increase in education increased the output of local rice in the Ebonyi State of Nigeria.

Farming experience in rice production was another factor that influenced its output in the study area. The more experienced a farmer is, the more efficient he becomes in the management of resources (Onyenweaku & Okoye, 2007).

Farm sizes, labour input, capital, and seeds were significant determinants of the output of rice in Abakiliki L.G.A. of Ebonyi State given their levels of significance at 5% and 1%. This result agrees with Ajoma *et al.* (2016) in Cross Rivers State. Expenditure on seeds however is inversely correlated with the maximized output of local rice, which implied that a reduction in the use of unimproved

seeds or local planting materials in the study area would increase the output of local rice in the area of study. Age was inversely related to output, implying that probably younger farmers would do better in local rice production than older ones. This is possible, because of the hoes and cutlasses used in agricultural production. The energy needed could be in abundance among the youth than in older farmers. Therefore, younger farmers would produce more local rice than older ones. The R^2, showed that 76.6% of the variation in the output of rice in Abakiliki L.G.A. has been predicted by the model.

6. Conclusion

In determining factors influencing the output of rice in Abakaliki L.G.A. of Ebonyi State, fifty (50) rice farmers were randomly selected from 17 different communities in Abakaliki L.G.A. Descriptive statistics and multiple regression were found useful in the data analysis. Analysis showed that most of the Abakaliki rice farmers sampled were in their active age with an average of 34.5 years. This showed that opportunities abounded for youth involvement in local rice output to meet domestic requirements. The findings showed that most rice farmers were married, and possessed one educational qualification or the other. This suggests that Abakaliki rice farmers were educated which could lead to a positive attitude towards the use of modern agricultural practices, farm management, and the increased output of local rice.

Sizes of a farm, man-days of labour, capital inputs, and seeds expenditure exerted significant influence in explaining the variation in the output of the local rice in the study area. The study also revealed that farm sizes, capital inputs, household sizes, level of education, and farming experience possess the expected positive signs with respect to the output of local rice. The R^2 of 0.766, implied that the chosen model accounted for about 76.6% of changes in the level of output of local rice. In conclusion, factors that significantly influenced the production of rice in Abakiliki L.G.A. of Ebonyi State of Nigeria during the period under survey were small farm sizes, inadequate and unskilled labour inputs, primitive capital inputs, and expenditure on unimproved seeds among others.

The study recommended that small farm sizes could be increased either through the acquisition of more lands by the smallholder farmers or Governmental intervention whereby such lands could be acquired through government efforts and made available to the farmers at a fee. Labour was another factor that significantly influenced the output of Local rice production in the area. Skilled labour could be attracted into local rice production through increased remuneration of labour in rice production. Capital inputs should be increased in the study area probably through credit liberalization or skewing of credit supply in favour of local rice production.

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