

Determinants Of  
Productivity Of Rice  
Farmers In Ogun  
State Nigeria

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**ABSTRACT**

This study examined determinants of productivity among rice farmers in Ogun state, Nigeria. Two-stage sampling method was employed for this study. Data was analysed using Descriptive statistics, Total factor productivity and Ordinary least squares regression analysis. Results showed that mean age of farmer and farming experience were 45.5 years and 15.5 years respectively. The regression result showed that age, age squared (life cycle of farmer), farm size, farming experience, numbers of years spent in school, number of days loss to sickness and household size significantly affected rice farmers productivity. The study recommends the enhancement of farmers' access to education and the encouragement of the Youths to practice agriculture and be trained on the importance of farming in order to improve their productivity.

**Key Words:** Farm productivity, Two-stage sampling, rice, and rice production.

**1.0 INTRODUCTION**

Agriculture is a significant sector of an economy, it also serves as an economic mainstay of farming households in Nigeria and sub-Saharan Africa as a whole. (Amaza, 2000; Udoh, 2000; Raphael, 2008). Agriculture serves as a means of livelihood for over 70% of Nigerian farmers that engage in the enterprise. With the ever-increasing population, Nigeria which is the 8th most populous nation in the world, with over 180 million inhabitants (NBS 2015). Nigeria is threatened with an increasing level of food insecurity and poverty. Poverty is widespread with a majority of Nigerians (80%) subsisting on less than \$2 a day. (UNDP 2009). With more than half of Nigeria's population currently engaged in the agricultural enterprise community (corporate Nigeria, 2009), and with the large majority of these individuals living in an agrarian community which are usually rural areas, the agricultural sector is critical to Nigeria's economic growth and development. Though agriculture accounts for about 40 percent of GDP, the level of growth and development in the sector has lagged behind other sectors in the economy, therefore making Nigeria to lose its leading export role in the world agricultural market and a major dependent on foreign export to meet its food production deficit.

Consequently it is estimated that Nigeria has lost a US\$10 Billion (1.6 Trillion Naira) annual export opportunity from groundnut, palm oil, cocoa, cotton and rice due to continuous declines and stagnations in their exports. Thus food imports are growing at an unsustainable rate of 11% per annum. As at 2011, Nigeria was the second world largest importer of rice expending 356 billion Naira per annum. (ATA 2011; Tihamiyu et al., 2014). Indicating a low level of productivity and sufficiency in Nigeria rice production over years compared to leading countries like Malaysia, Thailand, Indonesia, and Brazil. According to Egbetokun et al. (2014) the low level of Nigerian rice production has largely been due to low level of input utilization, inadequate government expenditure, and broken chain of network among other institutions that can help farmers improve agricultural productivity. These sectors include the financial sector (to help farmer access credit

facilities), the transport sector and the health sector. Which has resulted in low yield compared to those of neighboring countries in the region. (Benin, Cameroon, Chad, Ghana and Niger). These low output realized by Nigerian rice farmers is an indication that signals the need to measure their performance and productivity.

Therefore the study aim at achieving the following objective which include: to identify the socioeconomic characteristics of rice farmers in the study area .and to determine the determinants of productivity of rice farmers, which will help to enhance the existing and future productivity level of rice farmers in ogun state.

## **2.0 RESEARCH METHODOLOGY**

The study was carried out in Ogun State Nigeria, located at longitude. 7°00'N 3°35'E and latitude. 3°35' and 4°10'N, The State was created in 1976, It covers an area of about 16,980.55 km<sup>2</sup> (6,556.23 sq mi) (NBS, 2006). and it has a population of 3,751,140 (NPC, 2006).

### **2.1 SAMPLING TECHNIQUES AND SAMPLE SIZE**

A two stage random sampling technique was employed. All the four Agricultural Development Program (ADP) zones were used for the study. The first stage was the random selection of one Local Government Area (LGA) from each of the ADP zone (Ijebu North, Obafemi Owode, Ewekoro, and Ikenne Local Government Area). In second stage 30 rice farmers were random selected from rice producing villages in each of the 4 Local Government Areas summing up to a total of 120 rice farmers.

### **2.2 METHOD OF DATA ANALYSIS**

Descriptive statistics and Total Factor Productivity (TFP) model was employed in this study.

#### ***Total Factor Productivity (TFP)***

Total factor productivity was used to capture the determinants of productivity of rice farmers in the study area.

Following Bamidele *et al.*, (2008) and Balogun *et al* (2015), individual farm TFP can be measured as the inverse of unit variable cost. This is so since TFP is the ratio of the output to the Total Variable Cost (TVC) as shown in equation 3 below. This methodology ignores the role of Total Fixed Cost (TFC) as this does not affect both the profit maximization and the resource-use efficiency conditions. Besides, it is fixed and as such a constant.

To determine the determinants of rice farmer's productivity (TFP) in the study area, Ordinary Least Square regression method was applied. This methodology ignores the role of Total Fixed Cost (TFC) as this does not affect both the profit maximization and the resource-use efficiency conditions. Besides, it is fixed and as such

a constant. To determine determinants of rice farmer's productivity (TFP) in the study area, Ordinary Least Square regression method was applied.

$$TFP = \frac{Y}{TVC} = \frac{Y}{\sum P_i X_i} \tag{1}$$

But since

$$TFP = \frac{TVC}{Y} \quad \text{Then}$$

$$TFP = \frac{Y}{TVC} = \frac{1}{AVC} \tag{2}$$

$$AVC = \frac{TVC}{Y} = \frac{Y}{\sum P_i X_i} \tag{3}$$

Where Q = quantity of output in kg and TVC = Total Variable Cost (N), P<sub>i</sub> = unit price of variable input and X = quantity of variable input.

This is given as:

$$TFP = Y_i / P_i X_i$$

$$TFP = \sum Y_i / \sum P_i X_i \text{ (Kg/₦)}$$

Where,

TFP = total factor productivity for the ith farmer, Y<sub>i</sub> = quantity of rice produced by the ith farmer, P<sub>i</sub> = unit price of the ith variable input used, X<sub>i</sub> = quantity of the ith variable input used, and Σ = summation.

Ordinary Least Square regression: Ordinary Least Square regression was used for the determinants of productivity of rice farmers. The model is specified as follows:

$$TFP = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 + b_4 X_4 + b_5 X_5 + b_6 X_6 + b_7 X_7 + e_1 \dots \tag{4}$$

Where,

TFP = total factor productivity for the ith farmer (output value/input cost)

X1= Age (Years)

X2= Age squared (Years <sup>2</sup>)

X3= Farm size (Hectares)

X4= Farming experience (Years)

X5= Numbers of years in school ( years)

X6= days loss to sickness (days)

X7= primary occupation (farming =0,otherwise =1)

X8= Household size (persons)

X9=access to extension service

b<sub>0</sub> = intercept

b<sub>i</sub> = coefficient of ith variable

e = Random error

### 3.0 RESULT AND DISCUSSION

#### *Socio-economic characteristics of the sampled households*

Table 1 shows that, 46.7 % of the respondents were females while 53.3 % were male. This means that most of the farming household heads were males. The modal age for rice farmers in the study area was between 41-50 years, which means that majority of the rice farmers interviewed was in their middle age. The result also showed that, majority (85.5%) of the sampled farmers were married, therefore most of the farmers have at least person to cater for and which can also serve as source of family labor. The result also showed that 42.5 % of the farmers have household size with members not more than 5 people while 51.7 %t and 5.8% of the farmers have their household size as between 5-10persons and above 10 persons respectively. The result shows that 4.2% attained tertiary education, 30.8% and 25% attained primary and secondary level of education respectively while only 40 % had no formal education. This implies that 60 % of the farmers were literate. And 68 % of the farmer had farming has their primary occupation, 24.2 % of the farmers were into trading, 3.3 % were civil servant while 4.2 % were craft artisan.

Majority of 67.5 percent of the respondent cultivate farm land between 1-2 hectares while 1.7 % and ,13.3 % of the farmers cultivate farmland between 2.1 -3 and 3.1-4 hectors respectively.

Table 1, also shows that most 52.5% of the respondent operate on a leased land, 44.2% of the respondents acquired their lands through inheritance, while the remaining 3.3% of the respondents used joint ownership land .And finally 15.8% of the respondents have between less than 10 years of farming experience, 27.5% of the farmers had been in the business for between 11 and 20 years; while 10% of the farmer had more farming experience (that is between 31 and 40 years).

Table 1: showing the socioeconomic distributions of the respondents

Variables		Frequency	Percent
Sex	Female	56	46.7
	Male	64	53.3
	Total	120	100.0
Age(Years)	Below 30	17	14.2

	30-40	21	17.5
	40- 50	54	45
	50-60	22	18.8
	Above 60	5	4.2
	Total	120	100.0
Marital Status	Married	103	85.8
	Single	9	7.5
	Widowed	5	4.2
	Divorced	3	2.5
	Total	120	100.0
Household Size	0-5	51	42.5
	5-10	62	51.7
	Above 10	7	5.8
	0-5	51	42.5
	Total	120	100.0
Level Of Education	No Formal Education	48	40.0
	Primary Education	37	30.8
	Secondary Education	30	25.0
	Tertiary Education	5	4.2
	Total	120	100.0
Primary Occupation	Farming	82	68.3
	Trading	29	24.2
	Civil Servant	4	3.3
	Craft Artisan	5	4.2
	Total	120	100.0
Size Of Farm(Ha)	Less Than 1	17	14.2
	1 -2	81	67.5
	2.1 - 3	6	1.7
	3.1 -4	16	13.3
	Total	120	100.0
Source Of Land	Inherited	53	44.2
	Rent	63	52.5
	Joint Ownership	4	3.3
	Total	120	100.0
Farming Experience(Years)	0-10	19	15.8
	11-20	33	27.5
	21-30	46	38.3
	31-40	12	10
	Total	120	100.0

Sources: Field Survey, 2015

### Determinants Of Rice Farmers Productivity

The result of the regression analysis presented in table 2 shows an  $R^2$  values of 0.89 for rice farmers, implying that about 89% variations occurs in the total factor productivity of rice production among the respondents. This is explained by the specified explanatory variables in the model. The F-ratio for rice production is significant at 1% which implies that the data attest to the overall significant of the regression equation. Result shows that age, farming experience and household size showed a positive relationship

towards farm productivity of rice farmers while age squared(life cycle of farmers),numbers of years spent in school, farm size and number of days loss to sickness showed a negative relationship to farm productivity of rice farmers.

The positive relationship between age of the respondents and productivity suggests that the older the household heads, the higher the productivity. The positive relationship between farming experience and farmers productivity suggests that farmers with a higher farming experience tend to have higher productivity than those with no or less farming experience. Also the positive relationship between household size and farmer's productivity suggests that farmers with a higher household size tend to have higher productivity than those with less household size, because higher household size, results in to a higher family labour, thus reducing cost of hired labour.

The negative relationship between the life cycle of practicing farmers and productivity suggest that as the life cycle of farmer get worsen, the productivity decreases, and this is because the stock of health deprecates as age increases. While the negative relationship between number of days loss to sickness of practicing farmers and productivity suggest that productivity will decreases with increase in days incapacitate by sickness. And also the negative relationship between the number of years spent in school and their productivity will have a decreasing effect on their farm productivity.

Table 2: Ordinary Least Square Regression results for determinants of total factor productivity of rice farmers

Variables	Coefficients	Standard Error.	T value
Constant	-0.1451	0.0981	-1.48
Age	0.0063 *	0.0033	1.89
Age <sup>2</sup>	-0.00005 *	0.00003	-2.04
Farm size	-0.0083***	0.0026	-3.16
Farming experience	3.29e-06***	1.13e-06	2.91
Number of days loss to sickness	-0.0013***	0.0002	-5.42
Numbers of years spent in school	-2.29e-07**	1.09e-07	-2.10
Access to extension service	-0.00003	0.0001	-0.26
Primary occupation	-3.46e-15	0.0016	-0.00
Household size	0.0013 ***	0.0004	. 3.53

\*\*\*Significant at 1%, \*\*Significant at 5%, \*Significant at 10% .R<sup>2</sup> = 0.89, Adjusted R<sup>2</sup> = 0.86, F-value = 24.93

Sources: Field Survey, 2015

#### 4.0 CONCLUSION

This study has analyzed the determinants of productivity of rice farmers in Ogun State. The findings identified the factors that affects their productivity , and the result shows that age, age squared(life cycle of

farmer), farm size, farming experience, numbers of years spent in school, number of days loss to sickness and household size affects their productivities at different significant levels.

#### 4.1 RECOMMENDATION

Sequels to survey results recommendation are proposed to enhance the existing and future productivity level of rice farmers in Ogun State. Thus it is recommended that youths should be encouraged to practice agriculture and be shown the importance of farming and they should be trained in other to improve their productivity. Also Government and private sector partnership should be encouraged to organize agricultural programs and seminars available for youth so as to encourage them to move towards agriculture. Finally farmers should be encouraged to always keep records of their farming activities so as to know the level of their productivity, if it is growing or otherwise. This will also help to ascertain their weaknesses and challenges they will likely face in the future.

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