

Technical Efficiency of Ofada Rice Producers in Ogun State, Nigeria

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Abstract. The study investigated the technical efficiency of Ofada rice producers in Ogun State, Nigeria. Two multi-stage sampling procedure was employed to collect data from 120 respondents who were purposely and randomly selected. Primary data were obtained through the use of structure questionnaires. Descriptive statistics and stochastic frontier production function were employed for data analysis. The result of the study showed that majority (75.8%) of the respondents are male and the age of majority (40.8%) falls within 51-60 years. About 72.2% of the respondents are married and majority of the respondents (89.9%) are literate. Few of the respondents (1.7%) have farming experience below 5 years. The maximum likelihood estimates revealed that the quantity of seeds, farm size cultivated, labour used and quantity of fertilizer are the production factors affecting Ofada rice efficiency in the study area. These factors explain 90.5% of variation in Ofada rice production in the study area. The result revealed that the age of the respondents, farming experience, annual farm income and non-farm income coefficient are positive which indicates that there is a direct relationship with production efficiency, while formal education and farm size coefficient are negative which implies that an inverse relationship exist between

factors and production efficiency. These factors defined are significant to this study. Frequency distribution was used to describe the constraints faced by the rice farmers in the study area. The data revealed that majority (62.5%) of the farmers sampled lack technical skill in operations. Other constraints faced by the farmers are bad transporting system, demand pressure, scarcity of hired labour, lack of farm implements, high cost of production. Funds should be made available to the farmers by government. Orientation programme should be initiated by government on the use of agrochemical to aid production of Ofada rice in the study area so as tackle the demand pressure.

Keywords: Ofada Rice, Fund, Production, Government, Technical efficiency

1. Introduction

There is no doubt that agriculture is the mainstay of the economy of any developing country. Agriculture is one of the largest sectors of the Nigerian economy. The sector contributes about 42.6% of the Gross Domestic Product (GDP) and it serves as a means of livelihood for over 80% of the total population (Adegboye, 2004). Agriculture has contributed a lot to the

Gross Domestic Product (GDP) of the nation, with the GDP put at 58% from 1960-1969, 31% from 1970-1979, showing a decline due to the oil bloom (Aigbokhan, 2001), 41% from 1980-1989 and 42.6% from 2006-2010 (CBN, 2010; NBS, 2010). Agriculture plays a very important role, not only in securing food for the populace but it also contributed to the economy and plays a very significant role in upgrading the livelihood of the people of the country. It is generally accepted and acknowledged that the scope for agricultural production can be expanded and sustained by peasant farmers within the range of existing resource based and the available technology if farm productivity is raised by efficiency use of resources (Udoh, 2005). This discovery has therefore form the main reason why the concept of farm efficiency has remained important economic study especially in developing agricultural economics like Nigeria, where resources are meager and opportunities for developing and adopting better technologies are declining (Girei *et al.* 2014). Nigeria has a total land mass of about 13.8 million hectares of arable land and 2.91 million hectares of the land are single cropped.

The Nigerian population is over 140 million and it constitutes about a quarter of Africa's total population. The survey conducted by the United Nations Development Programme (UNDP) revealed that about 64.4% and 83.7% of the population live below \$1.25 and \$2 a day, respectively. Importation has been the escape route for food security in Nigeria due to increase in population. This is done to meet up with the demand for food, as demand is higher than supply. Nigeria imported some 1,300 thousand metric tons of milled rice in 2015/2016 (Statistics & Facts, 2015). This has adverse effect(s) on the foreign economy. The Nigerian government has embarked on an ambitious plan to make the

country self-sufficient in rice production in 2015 under the Agricultural Transformation Agenda, or ATA (USDA, 2012).

Technical efficiency is the ability to achieve an optimum level of output from a given input and production technology. Technical efficiency has defined in different forms by different authors; According to Koopmans (1951) "a producer is technically efficient if an increase in an output requires a reduction in at least one other output or an increase in at least one input, and if a reduction in any input requires an increase in at least one other input or a reduction in at least one output". Differently, Debreu (1951) and Farrell (1957) defined the following measure of technical efficient known as the Debreu-Farrell measure: "one minus the maximum equip proportionate reduction in all inputs that still allows the production of given outputs, a value of one indicates technical efficiency and a score less than unity indicates the severity of technical inefficiency".

Rice (*Oryza sativa*) is the seed of monocotyledon plant of the grass family *Gramineae*. (Kuldeep, 2006). It is one of the most cultivated and consumed cereals in the world, especially in Asia and Africa. Tropical and semi-tropical Asia contributed 90% of the global rice production. In spite of being produce on small and marginal farms in many of these countries, the production of rice has increased over the last three decades (Pate and Tan-Cruz, 2007; Hossain 2004; Kahi and Yabe, 2011). The United States (one of the largest rice exporter in the world) and Southern Europe regions (Longtua, 2000). It is a basic diet in Japan and India where annual rice productions exceed 40 million metric tons. Thailand and Vietnam depend on rice as the mainstay of their economies (Encarta, 2004). Several countries of Asia and Africa are highly dependent on rice as source of

foreign exchange earnings and government revenue (Rice Trade, 2011). Rice production is the second after wheat production of the largest produced cereal in the world. It is a crop that is not religion biased and it cut across cultural, national and international boundaries with very high demand. Cultivation of rice is virtually done in all the agro-ecological zones in Nigeria (Akande, 2001). It appreciable scale and dimension commenced in Nigeria during the Second World War due to a stop in importation from the Far East (Ojo, 1991). From the mid-1970s increase in the population at the growth rate of 2.8% per annum (Akpokeje *et al*, 2001) have significantly increase the consumption of rice. Increase in the land area under cultivation as doubtlessly increase the production of rice, but this increase has not been able to match the increase rate of rice consumption in Nigeria (NISER, 2002).

Agriculture is one of the largest sectors of Nigeria economy as it contributes more to the Nigeria GDP and also employed two-third of the nation workforce (NISER, 2002). Despite the contribution of agriculture to Nigeria economy and political development attention have been shifted from agriculture due to oil boom. But recently, the governments have shifted their focus back to resuscitating agriculture due to decline in revenue generated from the oil industries. Nigeria has huge agricultural potential. With over 84 million hectares of arable land, of which only 40% is cultivated; a population of 167 million people, making her Africa's largest market; 230 billion cubic meters of water; and abundant and reliable rainfall in over two thirds of its territory, the country has some of the richest natural resources for agricultural production in the world (This Day, 2016).

Rice is the most essential staple food in Nigeria, as its consumption rate is on the increasing rate predominantly among urban

dwellers. The annual demand for rice in the country is estimated at 5 million tons, while domestic production is 3 million resulting in a deficit of 2 million tons (Chuma, 2005). The low yield can be attributed to various factors such as agro climatologically problems, biological problems (i.e. problem of weed, pests and diseases), problem of input procurement and high cost of inputs, lack of credit facilities and poor price incentives, policy instability, among others. According to Olakitan (1997), the key factors limiting yield in rice production include mode of land preparation, planting methods, soil fertility management, pests, diseases and weed management/control Chan and Haque (1997) also identified socio-economic and infrastructure constraints which includes capital shortages, pest, diseases and weed infestation, lack of quality seeds and other necessary inputs and poor management practices as factors that hinder productivity.

2. Objectives of the Study

The main objective of this study is to examine the technical efficiency of Ofada rice producers in Obafemi-Owode Local Government, Ogun State.

The specific objectives are to:

- describe the socio-economic characteristics of the rice farmers;
- analyse the technical efficiency in rice production in Owode-Egba;
- determine factors affecting the production efficiency of the rice farmers;
- identify the constraints faced by rice farmers in the study area;

3. Research Methodology

3.1 Study Area

The study was carried out in Obafemi Owode Local Government Area of Ogun

State, Nigeria. Its headquarters are in the town of Owode at 6°57'N 3°30'E (Wikipedia, 2017) The local government has a land area of one thousand four hundred and ten square kilometers (1,410km²), and share a common boundary with Odeda Local Government and Oyo state in the north, Sagamu and Ikenne Local Government in the east, and Ifo Local Government and Lagos State. The population density of Obafemi Owode Local Government is about 230,000. It is made up of about 1,204 towns and villages with a land mass of 104,787.07 hectares of largely agricultural land. The Local Government is made up of people residing in Adigbe, Oba Kobape, Obafemi, and Ogunmakin, Ajebo, Owode, Ibafo, Iro and Mokoloko towns and they are mostly Egba. The common language being spoken is the Yoruba with the Egba dialect (Tripod, 2017).

Obafemi Owode Local Government is endowed with vast fertile land suitable for cultivation of rice, kolanut, sugarcane, maize, cassava, tomatoes and a wide variety of vegetables. The Local Government is generally known as the land of OFADA RICE. The major food crops of the area include cassava, rice, cocoyam, maize and vegetable, while palm and cocoa form the major cash crops. The people are majorly farmers and most of farmers involve in farming of arable crops. There are also who engaged in livestock and fishing.

3.2 Nature and Sources of Data

Primary data were obtained for this study. The data were obtained from the rice farmers in selected wards in Obafemi Owode Egba Local Government of Ogun State. Questionnaire and personal interview were used in the collection of necessary data from rice farmers. The primary data collected covered the significant aspect of

the output and input used in the production process.

3.3 Sampling Technique

In selection of the sample farmers, purposive and random sampling techniques were employed in the study area using multistage sampling procedure. First stage; this involved the purposive sampling, three (3) communities based on the dominance of rice farm in these area. The second stage involved the random sampling techniques. There was a random selection of two (2) villages per communities and finally twenty (20) rice farmers was randomly selected from each village; one hundred and twenty (120) sampled farmers were randomly selected in all.

3.4 Analytical Techniques

Socio-economic characteristics of the rice farmers

Descriptive statistics tools such as frequency distribution; percentage and so on was used to describe the socio economic characteristics and constraints facing ofada rice producers in the study area.

Technical efficiency of rice farmers

The stochastic frontier production function model of Cobb-Douglas functional form was employed to estimate the farm level technical efficiency of the food crop farmers. The Cobb-Douglas functional form was used because it has been used in many empirical studies particularly those relating to developing country agriculture and the functional form meets the requirement of being self-dual i.e., it allows an examination of economic efficiency. The production functional form is specified as:

$$Y_i = f(X_i; \beta) \exp V_i - \mu_i$$

The stochastic frontier model for estimating the technical efficiency of the rice farms is

empirically specified by the Cobb-Douglas frontier production function as:

$$\ln Y_i = \beta_0 + \beta_1 \ln X_1 + \beta_2 \ln X_2 + \beta_3 \ln X_3 + \beta_4 \ln X_4 + \beta_5 \ln X_5 + V_i$$

Where:

Y_i = Output of rice (kg)

\ln = logarithm to base e

β_0 = constant or intercept

β_1 - β_5 = unknown scalar parameters to be estimated

X_1 = quantity of seeds (kg)

X_2 = farm size cultivated (ha)

X_3 = labour used (man days)

X_4 = quantity of fertilizers used (kg)

X_5 = quantity of agrochemicals used (liters)

V_i = random errors

U_i = Technical inefficiency effects predicted by the model

Subscript i indicate the i^{th} farmer in the sample.

The technical inefficiency effects U_i is affected by:

$$U_i = \delta_0 + \delta_1 L_1 + \delta_2 L_2 + \delta_3 L_3 + \delta_4 L_4 + \delta_5 L_5 + \delta_6 L_6$$

Where:

U_i = technical inefficiency effects

L_1 = Age of the farmer (years)

L_2 = Farming experience (years)

L_3 = Educational level of farmers (Number of years spent in school)

L_4 = Household size (Number of person)

α_1 - α_4 are the scalar parameters to be estimated α_0 = constant or intercept These were included in the model to indicate their possible influence on the technical.

Factors affecting the production efficiency of the rice farmers

Multiple regression analysis was used to determine the factors affecting technical efficiency of the rice farmers. The structural equation of the analysis is given as:

$$Y = X_i \beta + \varepsilon_i$$

Where:

Y = production efficiency

X_1 = Age of the farmer (years)

X_2 = Farming experience (years)

X_3 = Years of formal Education

X_4 = Farm size (hectares)

X_5 = Annual farm income (naira)

X_6 = Non-farm income (naira)

X_7 = Amount of credit obtained (naira)

X_8 = Labour use

U = Error Term

4. Results and Discussion

Table 1: Socio-economic Characteristics of the Rice Farmers

Variable	Frequency	Percentage
Age (years)		
19-30	1	8
31-40	10	8.3
41-50	23	19.2
51-60	49	40.8
Above 61	37	30.8
Sex		
Male	91	75.8
Female	29	24.2
Religion		
Christian	48	40.0
Muslim	52	43.3
Traditional	20	16.7

Household Size		
Below 4	22	18.3
5-10	95	79.2
10-15	2	1.7
Educational Level		
No formal education	10	8.3
Primary	61	50.8
Secondary	37	30.8
Tertiary	7	5.8
Others	3	2.5
Farming Experience		
Below 5 years	2	1.7
6-20 years	37	30.8
21-40 years	63	52.5
41-60 years	18	15.0
Marital Status		
Married	87	72.5
Divorced	8	6.7
Single	18	15.0
Widow/ Widower	3	2.5
Separated	4	3.3
Occupation		
Farming	83	69.2
Trading	18	15.0
Civil Service	5	4.2
Transportation	7	5.8
Security	7	5.8
Annual Farm Income		
Below 90000	2	1.7
99000- 599000	24	20.0
99000-1999000	72	60.0
2000000-4999000	21	17.5
Above 5000000	1	0.8
TOTAL	120	100

Source: Field Survey, 2017

Data in Table 1 presents the socio economic characteristics of the rice farmers using frequency distribution table. Socio-economic status (SES) is an economic and sociological combined total measure of a person's work experience and of an individual's or family's economic and social position in relation to others, based on income, education and occupation, (NCES, 2008). Socioeconomics characteristics of the respondents give a clear clue regarding the people in the study area as well as the demographic pattern in general. The socio-economic characteristics of Ofada rice farmers in Obafemi Owode Local Government Area of Ogun State. These socio-economic characteristics include their age, sex, marital status, educational level,

household size, farming experience, are stated below

The finding on farmers' age distribution revealed that majority of the respondents (40.8%) were between 51-60 years, and 30.8% of the respondents were above 60 years. The implication of this is that old people are engaged in rice farming than the young people which will affect the productivity level of rice in the area of study. It is deduced that majority of the respondents are becoming less active in rice production prior to the previous study conducted by Wogu, (2013) that the majority of the respondents are still very active and can engaged in energy sapping work.

Sex of farmers is a significant factor in the productivity level of a farm. Research conducted by Nigeria National Bureau of Statistics and brief by The World Bank Group/Africa Region Gender Practice, stated that women have less access to extension services, smaller and less secure plots of land, less access to physical inputs, such as fertilizer and herbicide, and less use of labour, compare to the men access to these benefits which directly affect the productivity level of the two gender (Oseni *et al.*, 2015). The result indicated that majority (75.8%) of the respondent were males while 24.2% were females. This showed that men are more involved in Ofada rice production. They are expected to be more productive. This is also an indication of the nature work as it is more stressful for women to be involved at higher rate. However, women are more involve in the post-harvest activities like harvesting, marketing and packaging.

The result also showed that 43.3% of the respondents are Muslim, 40.0% of the respondents are Christians and 16.7% of the respondents are into traditional religion. This implies that the three type of religion practice in the country are represented in the study area and production of ofada rice is religion neutral. The result on household size revealed that (79.2%) of the respondents' household members lies between 5-10 persons, while <4 members constituted 18.5%, 1.7% were those that lies between 10-15 household members. The household size was fair with average of 5 persons. This might be due to the intensity of labour involved in rice farming as members can be of help in the production of the rice, which can indirectly reduce the cost of production.

Education permits the individual to know how to seek for and apply information in

day-to-day problem solving. This is because as the individual gained the aptitude to read, he is able to apply the scope of his experience through the print media (Umunna, 2010). Education have effect on the productivity of farmers and it is also expected to reduce the level of technical inefficiency as educated farmers would find it easier to understand information on new innovations on farm practices and production technologies (Osun *et al.* 2014). It was also found that 50.8 % of the rice farmers have primary education, 30.8% have secondary education, and 5.8% have tertiary education. Only 8.3% of the rice farmers have no education. This implies that the level of literacy is high in the study area and this will be of great help in reducing the technical inefficiency in the study area.

The analysis of the farming experience of the respondents revealed that majority (52.5%) of the rice farmers had farming experience between 21- 40 years; this implies that the rice farmers are more experienced in rice production which will have positive effect on their output.

Marital status of a farmer is an important factor affecting the level of production and productivity on peasant farms. (Umunna, 2010). The result showed that majority (72.5%) of the respondent are married. The implication of this is that household heads that are married and have responsibilities which will make them seek for more income from rice production as they cater for their family. People in their household can also be source of family labour from their faming activities.

Occupation is one of the major criteria of measuring the socio economic characteristics of a society as a whole. Majority (69.2%) of the respondents involved mainly in farming as their primary occupation. While, the remaining

respondents chose farming as their secondary occupation. This implies that majority of the respondent depend on farming as a means of livelihood. The distribution of annual farm income showed that that (80%) of the respondents interviewed have annual farm income range between ₦99,000-₦5,999,000. This has a good implication on the production of rice in the study area. Farmers in the study area would have enough money or credit to procure inputs needed for the next farming season and this will reduce borrowing rate form cooperative societies and other credit organizations.

5. Maximum Likelihood Estimates of the Technical Efficiency of Ofada Rice Farmers

Technical efficiency of the Ofada rice farmers was estimated using Maximum Likelihood Estimates Method (MLE) as presented in the Table 2. The result showed that quantity of seeds, farm size cultivated, and labour used, quantity of fertilizer used and quantity of fertilizer used are the production factors influencing the Ofada output. The variance ratio γ is 0.905 indicating that the variables defined explained 90.5% of the variation in Ofada rice production in the study area. The coefficient of quantity of seed used is 0.385, it is positive and it is significant at 5 percent level of significance. As expected that increase in the quantity of rice seed planted will lead to increase in the total output, if all things being equal. This will definitely increase the production efficiency of the farm.

Farm size coefficient of 0.196 is positive and significant at $p \leq 0.01$ signifying that farm size has contribute effectively to the output perhaps in terms of the fertility and suitability of the land in planting of Ofada rice use. Increase in farm size will increase

the total output of rice in the study. This assertion will true if the workers' ratio is commensurate with the farm size and there is adequate supervision over farm. This also agrees with the findings of Girei *et al.* (2012) who determined the technical efficiency in paddy rice production in Niger Delta Region of Nigeria.

Agrochemicals use coefficient (0.032) is positive and significant at $p < 0.001$. This has a positive effect on Ofada rice production efficiency in the study area. Increase in agrochemical at minimal level suitable for the farm land and rice production will increase production efficiency as a result of increase in total output of rice. This helps to wade off and control factors (pests and diseases, low fertility, weeds...) that may have negative effect on the total output of rice in the study area.

Estimated results of the inefficiency model revealed that the inefficiency factors are significant. The coefficient of age is negative (-1.119) and significant at $p < 0.01$ showing that Ofada rice production efficiency reduces as the age of the farmers' increases. This implies that the farmers will not be able to cope with the energy requirement of the farm operations for establish rice farms as they in age. If modern technology applied, it can reduce its effect i.e. age and production efficiency.

Educational level has been said to be an important influence on the rice farmers adopts new technology for their farming activities. The coefficient of educational level is positive and statistically significant at $p < 0.05$. There is a direct relationship between efficiency and educational level, as the educational level increases the efficiency decreases. This is does not meet *prior expectation* contrast to Durojaye and Ogunjinmi (2015) findings that farmer's

level of efficiency increase as their level of education increases.

Household size coefficient (-0.462) is negative and significant at $p < 0.05$. As the household size increases the efficiency increases. Increase in household size will increase family labour. Majority of farmers

in rural area cultivate small plot and family labour is their major source of labour. Increase in farm size increases production efficiency, because agricultural production activities are labour intensive and large household can provide labour at reduced or no cost (Ajibefun and Daramola 2003).

Table 10: Maximum Likelihood Estimates for Ofada Rice Farmers

Explanatory variables	Coefficient	Standard Error	T- value
Constant	6.608***	0.505	13.079
Quantity of seeds (kg)	0.385***	0.116	3.332
Farm size cultivated (ha)	0.196**	0.108	1.819
Labour used (mandays)	-0.475	0.001	-0.363
Quantity of fertilizers used (kg)	0.003	0.009	0.357
Agrochemicals used (liters)	0.044***	0.014	3.097
Inefficiency variables			
Constant	-6.013	3.808	-1.579
Age of farmer (years)	0.055	0.036	1.529
Farming experience (years)	0.008	0.019	0.421
Educational level (years)	0.287**	0.145	1.979
Household size (number)	-0.462**	0.243	-1.899
Sigma squared (σ^2)	1.241***	0.448	2.768
Gamma (γ)	0.906***	0.040	22.385
Log likelihood function	-77.478***		
LR test of one-sided error	24.998***		

***Significant at 1%;

Source: Field Survey, 2017.

The frequency distribution of the technical efficiency estimate from the stochastic frontier model is depicted in the Table 3 given below. The efficiency level of the farm ranges from 0.11-0.90. Majority (45%) of the farms in the study area are operating at efficiency level ranging from 0.81-0.90. The mean efficiency of rice producing farms is 0.756. This is an indication that there still need for the increase in production efficiency of rice by 24.4% in the study area. The minimum and the maximum efficiency level are 0.126 and 0.951 respectively.

Table 3: Decile Range of Technical Efficiency of Farmers

Frequency Distribution	Number of Farms	Percentage
0.11-0.20	3	2.5
0.31-0.40	1	0.8
0.41-0.50	4	3.3
0.51-0.60	2	1.7
0.61-0.70	18	15
0.71-0.80	34	28.3
0.81-0.90	54	45.0
0.90-1.00	4	3.3
0.80-0.90	72	60
Above 0.90	17	14.2
Total	120	100

Source: Field Survey, 2017.

Descriptive statistics	
Number of Observation	120

Minimum	0.126
Maximum	0.951
Mean	0.756
Standard Deviation	0.146

Source: Field Survey, 2017.

6. Factors affecting the Production Efficiency of the Rice Farmers

Multiple regression analysis was used to determine the factors affecting production efficiency of the rice farmers in the study area. Double log form was used to analyse the data factors. The negative results have an inverse relationship with the production efficiency while the positive results have a direct relationship with the production efficiency. From Table 4, age of the farmer, farming experience, annual farm income and non-farm income, are positive while years of formal education and farm size are negative and statistically significant at 5% and 10% respectively.

Age is negative and significant at 10 percent to the output of farmers in the study area. This implies that as the age of rice farmers increases their efficiency decreases. Farmers beyond productive age tends to reduce in production efficiency, this might be due to reduction in the energy level of the farmers as the Ofada rice production requires more energy during the production process. It also might affect the ability of farmers to cope with risk involved in production of Ofada rice in the study area. Farmers who are beyond the productive age are late adopters of new technology or new farming techniques because they are used to their old farm practices and attitude might not aid the production efficiency. This is supported by the findings of Osun *et al* (2014) that productivity increases with age but start to decline as farmers becomes very old.

Farming experience coefficient is positive and statistically significant at one percent. The implication of this is that the more experienced a farmer is the more efficient his production. Increase in experience help farmers’ prediction and also to create measure to arrest any shock if notice earlier. This is consistent with Durojaye and Ogunjinmi (2015) that farmers with less experience are inefficient compare to their counterpart with more experience.

Farm size is negatively significant at 1 percent. This implies that the higher the farm size the less the efficiency. Farmers who possess large farms tend to be less efficient because the rate of over surveillance concentration of inputs and labour on small plot is higher than large plot.

Annual farm income is positively significant at 5 percent. The implication of this is that the higher the farm income the higher the efficiency of rice farmers in the study area. Increase in farmers’ income aid the level of output as to necessary inputs needed for the productions are obtained. This also helps farmers to increase their level of production.

Non- farm income is positive and significant at 5 percent. This implies that the higher the non -farm income the higher the efficiency. This severs as a risk measure peradventure there is reduction in the annual farm income and there is a need to carry out production in next planting season

Table 4: Estimate of factors affecting production efficiency of Rice farmers

Variables	Coefficient	T-value
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Constant		-2.889
Age	-2.320*	1.817
Years of farming experience	1.651***	2.038
Years of formal education	-8.417**	-2.319
Farm size	-3.562*	-1.852
Annual farm income	3.643**	2.340
Non-farm income	8.833**	2.225
Amount of credit obtained	-0.786	-1.472
Labour use	1.222	1.350
R ² = 0.949		
Adjusted R ² = 0.743		

***Significant at 1%; **Significant at 5% and *Significant at 10%

Source: Field Survey, 2017.

7. Constraints faced by Ofada rice farmers

The major factors that limit farmers in respect to their production are revealed in the Table 5, as analysis was carried out on their level of the effect on farmers. In the study area lack of food security has higher percentage of 74.2%. This implies that the production level of rice is sufficient for the community and food security is being achieved, thou not totally achieved. Farmers in the study area also have pest and disease controlled at minimal level. This was reflected in the percentage (67.5%) gotten from the insignificant section. This might be due to the fact that most farmers are more experienced in carrying precautionary measures against pest and disease. Lack of farm implement (43.3%) tends to be on an important factor affecting the farmers.

Generally, it was observed that most of the farmers that were sampled still use traditional method of farming, which affects the production level of the farmers. Scarcity of hired labour (46.7%) is of no importance as farmers have sufficient people to carry out their farm operations. Lack of technical skill has a higher percentage (62.5%) in the strongly significant section. This implies that level of exposure of people in the

community to operate major farm equipment that aid in farm operations is very low. This has an effect on farmer’s interest to purchase this equipment to run their day-to-day farming activities. The demand pressure is barely high with 44.2 percent. The implication of this is farmers’ capacity to meet the demand pressure is reducing as Ofada rice is beginning more importance in the country than the previous years.

The community generally is poorly developed compare to the rate of development in the present world today. Major facilities such as good road network, health care centers to cater for the farmers well-being, good transportation system etc. that aid production of Ofada rice production are not installed. This was reflected in the analysis carried out with percentage of 56.7 percent. High cost of production (36.7%) is an important factor militating against the production of Ofada rice in the study area. Lack of farmers’ access to finance to carry out their production process is very high as most farmers are not able to meet up with credit organization requirement i.e. the interest rate. This has a negative effect on the decision of the farmers on the production level as farmers tend to make their decision based on the amount credit available.

Table 5: Ofada Rice Production Constraints

Constraints	Insignificant	Significant	Slightly	Strongly	All
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					significant		significant			
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%
Lack of technical skill	4	3.3	13	10.8	28	23.3	75	62.5	120	100
Demand pressure	2	1.7	15	12.5	50	41.7	53	44.2	120	100
Poor infrastructure	3	1.7	14	11.7	35	29.2	68	56.7	120	100
Lack of access to finance	5	4.2	16	13.3	26	21.7	72	60	120	100
High cost of production	6	5.0	32	26.7	38	31.7	44	36.7	120	100
Lack of farm implements	26	21.7	52	43.3	17	14.2	23	19.2	120	100
Scarcity of hire labour	56	46.7	37	30.8	15	12.5	11	9.2	120	100
Others	56	46.7	35	29.2	14	11.7	9	7.5	120	100
Pest and disease	81	67.5	22	18.3	11	9.2	3	2.5	120	100
Lack of food security	89	74.2	19	15.8	5	4.2	5	4.2	120	100

Source: Field Survey, 2017.

Freq.: frequency, %: percentage.

8. Conclusion and Recommendations

8.1 Conclusion

Rice is the only major cereal crop that is primarily consumed by human beings directly as harvested. Rice is also incorporated into domestic animal feed, the bran, meal, and chopped straw are useful, especially when mixed with the polishing or given with skim milk. The polishing are also important source of furfural and other chemurgical products. This study investigates the technical efficiency of Ofada rice farmers in Obafemi Owode Local Government Area, Ogun State. Data were collected across 120 respondents that were selected randomly. Summary of the data analysed showed that farmers that are in their reproductive stage, literacy level of the farmers are high, majority of the farmers are married and more male are involved in farming than the females.

The estimated results of the study also revealed that there is presence of technical inefficiency in the production process that is cause of variation in rice output of the farms. The result of technical efficiency revealed that rice producing farms are not fully efficient in the study area. The mean efficiency of farms in the study area is 75.6%. The implication of this is that there is still a need to increase the scope of rice production in the area by 24.4%. The study

also analyzed factors that determine production in efficiency. The problems encountered by the farmers in the study area which include lack of technical skill, lack of access to credit facilities, high cost of production and poor infrastructure.

8.2 Recommendations

Based on the findings of this study, these following solutions are recommended in order to improve the efficiency level of rice farmers in the study area. They are stated as follows:

Government should initiate programmes that will enlighten farmers on the importance of use of agrochemicals and their positive effect on their on their output and also on their production efficiency.

Government should encourage by provision of fund for research institute on improvement of rice seeds that will aid farmers output.

Provision of adequate infrastructure such as good road network (rural- urban; urban – rural), electricity and transportation system, this will aid the production level of Ofada rice.

Government should create avenue for farmers to have access to credit facilities and loan should be available at affordable interest rate.

Farm inputs such as fertilizer, seed, agrochemical should be subsidize by the government so as to reduce the cost of production.

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