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Effects of the Use of Credit on the Output and Technical Efficiency of Small-scale Ofada Rice Farmers in Ijebu North-East Local Government Area, Ogun State, Nigeria

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Abstract

This paper examines the effect of credit use on the output and technical efficiency of small-scale Ofada rice farmers in Ijebu North East Local Government Area of Ogun State. A multi-stage sampling technique was used to select 120 Ofada rice farmers in the study area. Data collected were subjected to descriptive statistics to describe the socioeconomic characteristics of the respondents, logit regression analysis to analyze the effect of credit use on small scale Ofada rice production and stochastic frontier production model was used to determine

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the relationship between the Ofada rice output and the level of input used in the study area. Findings from the study showed that 60.8% of the farmers do not use credit and those who did sourced for it informally. Logit regression analysis revealed that marital status and household size significantly influenced the effect of credit use on Ofada rice production negatively at 10% and 5% level of significance respectively while the number of years spent in school, farming experience, and membership of farmers' association had significant positive influence on the effect of credit on Ofada rice production. Stochastic analysis for farmers who used credit revealed that an increase in seed and pesticide use significantly increased output and a unit increase in farm size reduced their output. For farmers who did not use credit, total labour, and farm size significantly increased output. Technical efficiency estimates for both parties tends towards 100 indicating high technical efficiency. Major constraints in accessing credit identified by small-scale Ofada rice farmers include high interest rate, lack of trust in lending institutions, lack of guarantor or collateral and incorrect filling of application form. Based on the findings, the researchers recommend that credit, agricultural inputs subsidies, and extension services should be strengthened to cover more villages and settlements with the encouragement of educated youths and educated farmers to go into Ofada rice production.

Keywords: Credit Use, Production, Ofada Rice, Logit Regression, Technical Efficiency

INTRODUCTION

Ofada rice (*Oryza sativa japonica*) is an indigenous variety grown under the upland production system in Nigeria. Its production has geographical spread covering Ogun, Lagos, Osun, Ekiti and Oyo states with Ogun state being the focal point (Omonona et al., 2012). It is largely grown in

eight Local Government Areas of Ogun State and consumed as a whole grain. Ofada rice has gained prominence and it is gradually drawing international attention (Anounye et al., 2007) since it has revealed a strong consumer disposition and it has been perceived to be more nourishing due to its natural taste. It is cultivated under diverse ecological and production systems (upland, rain fed, inland shallow, deep water/flooding, and lowland irrigated rice production systems) (Rahji, 2005). According to Osaretin et al., (2007), the Ofada rice variety contains higher protein, fiber and lower water than the commonly consumed foreign rice. The variation in protein content might be due to the processing and storage methods employed during and after its production as its dietary fiber constituent results in reduction of the risk of bowel disorders and fights constipation. The lower water content accounts for longer shelf life. Apart from local consumption of Ofada rice, it can be used to make starch for laundry, cosmetics and textiles, beer, wine, spirits, and oil. The oil is clear, light, odorless and can be used to manufacture soap, and as anti-corrosive and rust-resistant oil. Among many uses of Ofada rice, it can assist in employment creation, revenue generation as well as economic growth and development (Omonona et al., 2012). The production of Ofada rice relative to other rice varieties cultivated in Nigeria is handicapped by inadequate farmlands caused by urban migration, input unavailability, insufficient credit facilities, and inadequate storage facilities amongst others.

Agricultural credit is considered essential to the process of improving agriculture and transformation of the rural economy. According to Mahmood et al., (2009), the introduction of easy and cheap credit facility is the quickest way for boosting agricultural production. The argument is that the agricultural sector depends more on credit than any other sector of the economy because of the seasonal variations in the farmers' returns and credit requirement in the transformation of subsistence for them to earn more money and improve their standard of living. It also enhances the productive capacity of the poor through financing investment in their human and physical capital. The demand for credit for productive investments usually comes from the poor who are less risk – averse. It enables them to overcome liquidity constraints, thereby

making it possible to undertake investments that can boost production, employment and income. Credit constraint to farm households in Nigeria imposes high cost on the society in terms of rural unemployment, rural poverty, distortion of production, and liquidation of assets (Rahji and Adeoti, 2010).

Olagunju and Ajiboye (2010) opine that farmers require credit for production purposes; Credit is required for the payment of wages, procurement of inputs, like fertilizers, herbicides, and improved rice variety's seeds. Credit is needed for marketing of produce like transportation, storage, processing, and other marketing related functions. High level of poverty is common among small-scale farmers who keep large family sizes, have high level of non-literacy and strict adherence to traditional methods, which leads to low crop yields and low income level. This makes it difficult for them to meet their financial needs for agricultural production from personal savings. Hence, seeking for other sources of input becomes imperative in order to meet up with their agricultural demand. High cost of risks involved in agriculture as well as high default rate among small scale farmers have been identified as major reasons commercial banks are unwilling to grant credit facility to small scale farmers (Okpara, 2010). In the same vein, the study further reveals that, untimely disbursement of agricultural loans, high level of office bureaucratic protocols involved in credit acquisition among others from formal sources have also been implicated, while high interest rates, small size of loan and short time duration for loan repayment have been identified in the case of informal sources of credit.

The Federal Government of Nigeria (FGN) had made provision of credit a major thrust of its agricultural policy since the 1970s when it introduced the Agricultural Credit Guarantee Scheme Fund (ACGSF) managed by the Central Bank of Nigeria. Under this scheme, Commercial Banks are to make available to small-scale farmers small loans, which are guaranteed by the Federal Government. In addition, banks were mandated to allocate a certain proportion of credit portfolios to agriculture. However, mandatory allocation of credit to agriculture was discontinued. This had far-reaching implications. The FGN as a follow-up cushioning measure

recapitalized and repositioned the Bank of Agriculture (BOA) for better performance (Okunmadewa, 2009).

The production of Ofada requires the adoption of improved production practices. Therefore, credit facility is needed to purchase improved seeds, agrochemicals, fertilizers, and to hire labour to ensure timeliness of farm operations. Despite the critical roles credit play in agricultural development, the abuse and misuse of credit meant for agricultural purposes by farmers have been reported. The consequence is the non-realization of the objective such credit was meant to achieve. This calls for an investigation in the study area with a view to enhancing credit utilization for intended purposes. Credit is also hard to come by for the poor resource farmers and even when available, it has been politicized such that only farmers who are connected to politicians get access to soft loans, which they divert to other ventures other than crop production (Okurut *et al*., 2005).

The main objective of this study is to evaluate the effect of credit use on the output and efficiency of small-scale Ofada rice farmers in Ijebu North-East Local Government Areas in Ogun State, Nigeria. The specific objectives of the study are to:

i. describe the socio-economic characteristics of small-scale Ofada rice farmers in the study area;
ii. identify the various sources of credit available to small-scale Ofada rice farmers in the study area;
iii. analyze the factors affecting the use of credit by small-scale Ofada rice production in the study area;
iv. estimate the relative technical efficiency in Ofada rice production of credit users and non-credit users in the study area and
v. Identify the constraints limiting small-scale Ofada rice farmers from use of credit in the study area.

RESEARCH METHODOLOGY

THE STUDY AREA

Ijebu North- East Local Government Area is located in Ogun State, South-west of Nigeria. The Ogun state Agricultural Development Program (OGADEP) is divided into four agricultural zones namely; Ilaro, Abeokuta, Ijebu-Ode, and Ikenne. The various zones are divided into blocks, while the blocks are further divided into cells. Ijebu North-East is under the Ijebu-Ode zone, which has six blocks namely; Isoyin, Ala, Ijebu-Igbo, Ago-Iwoye, Ibi-Ade, and Ijebu-Ife. The Isoyin block consists of six cells namely; Isoyin, Atan, Ijebu-Ode, Itamapako, Ilese, and Ogbogbo. Atan is the headquarters of Ijebu North-East Local Government and it is located on latitude 6.900°N and longitude 4.017°E. It has an area of 118km²(46 sq mi) and a population of 67634 at the 2006 census.

SAMPLING PROCEDURE AND SAMPLING SIZE

The study adopted a multi-stage sampling technique to select respondents. The first stage of sampling involved the random selection of the Ijebu Ode zone from the four agricultural zones through the information supplied by Ogun State Agricultural Development Agency (OGADEP). The Isoyin block was purposively selected in the second stage because of the prevalence of Ofada rice production in the area. The third stage involved the random selection of six (6) villages using simple random sampling technique. The last stage involved the random selection of 20 twenty Ofada rice farming households. The sample size for the study was 120 respondents. Primary data were collected by personal interviews with the aid of a structured questionnaire. Data collected include socioeconomic characteristics of responding Ofada rice farmers, Ofada rice production data such as resources used, costs, credit use, various credit sources available, and constraints to credit acquisition among others.

Sampling Techniques

Descriptive Statistics: This includes the use of means, frequency, and percentage tables. They were used to present information on farmers' socioeconomic variables such as age, household size, rice farming

experience, available credit sources, credit use and constraints to credit use.

The Logit Regression Model: This was used to analyze the factors affecting the use of credit by small-scale Ofada rice farmers in the study area. This is mathematically stated thus:

$$L_1 = \ln\left[\frac{P_i}{1-P_i}\right] = \beta_{\%} + \hat{a}_1 X_1 + \hat{a}_2 X_2 + \hat{a}_3 X_3 + \hat{a}_4 X_4 + \hat{a}_5 X_5 + \hat{a}_6 X_6 + \hat{a}_7 X_7 + \hat{a}_8 X_8 + \hat{a}_9 X_9$$

Where $P_i = 1$ if respondent used credit

$P_i = 0$ if respondent did not use credit

X_1 = Age of farmers (years)

X_2 = Gender (0 for male, 1 for female)

X_3 = Marital Status (1 for married, 0 for single)

X_4 = Household size (Number of persons)

X_5 = Education attainment (years spent in school)

X_6 = Farming Experience (years)

X_7 = Farm Size (hectares)

X_8 = Extension Contact (Yes=1, No=0)

X_9 = Membership of cooperative society or farmers' association (1 if member, 0 if otherwise)

Stochastic production frontier model: This was used to estimate the relative technical efficiency in Ofada rice production of credit beneficiaries and non-beneficiaries.

The stochastic frontier production function model is written as:

$$Yi = f(Xa, ß) + V_i - U_i$$

Where Yi = the quantity of agricultural output in a specified unit,

Xa is the vector of input quantities and â is the vector of production function parameters

The frontier production function f (Xa, â) is a measure of maximum potential output for any particular input vector Xa. The V_i and U_i cause actual production to deviate from this frontier. The Vi is the systematic component, which captures the random variation in output, which are due to the factors that are not within the control of the farmers (e.g. temperature, moisture, natural hazards).The V_i is assumed to be independently, identically distributed with zero mean and constant variance {i.e. N (O, ä^{2}u)} and independent of U_i. The Ui is a non-negative term representing the deviations from the frontier production function, which is attributed to controllable factors (technical inefficiency). It is half normal, identically and independently distributed with zero mean and constant variance {i.e. /N(O, ä^{2}u).

The stochastic frontier production function model is established using the maximum likelihood estimation procedure (MLE). The technical efficiency of an individual farm is defined in terms of the observed output (Y_i) to the corresponding frontier output (Yi) given the available technology, that is,

$TE = Y_i$

$Y_i^* = \exp (X_i b + V_i - U_i)$

$\exp (X_i b + V_i) = \exp (-U_i)$ (2)

So that, O d"TE d"1 (Seyoum *et al*., 1998)

RESULTS AND DISSCUSSION

Socioeconomic Characteristics

Table 1 gives the schedule of some of the farmers' socio-economic variables. Most households (74.2%) were headed by males; male dominance can be attributed to the drudgery attached to rice cultivation. In addition,

women tend to cultivate crops, which require less labour in order to have time for their household. This result was supported with the findings of Wakili and Isa (2015) titled "Technical efficiency of small scale rice producers in Adamawa State, Nigeria". The average age of the farmers was 46 years. This suggests that the farmers may be productive since their average age is above the youthful productive stage. Majority of respondents (59.2%) had primary school education (spent a minimum of 6 years in formal education); this means they can easily understand production and marketing information. The household size averaged about seven (7) persons with the smallest household having three (3) members and the largest household having 14 members. Land size used for Ofada rice production averaged 1.7 ha per farmer. A portion of the respondents (64.2%) were members of a farming group, while 30% had access to extension service, suggesting that they were assisted technically and they had at least 4 years farming experience. About 69.2% involved in the cultivation of other crops as their secondary occupation, 16.7% engaged in trading, 5.0% were artisans and only one respondent was a civil servant. This means that the respondents do not only rely on Ofada as a source of income and this may limit their overall efficiency. This finding is in line with the work of Sekumade and Toluwase (2014). The highest percentage (79%) of those that had access to credit opined that credit facilities should be provided in form of agricultural inputs subsidies. Such inputs like fertilizers, herbicides, insecticide and tractors for hiring should be delivered timely when it will be useful for rice farming operations.

Table 1: Percentage Distribution of Socioeconomic Characteristics of the Respondents

Variable	Frequency	Percentage
Gender		
Male	89	74.17
Female	31	25.83
Age		
= 40	27	22.50
41 – 50	62	51.67
> 50	31	25.83
Marital status		
Single	1	0.83
Married	93	77.50
Widowed	16	13.33
Divorced	10	8.33
Educational status		
Non-literates	42	35.00
Primary Education	71	59.17
Secondary Education	6	5.00
Tertiary Education	1	0.83
Farming Experience		
2 – 4	69	57.50
5 – 7	49	40.83
8 – 10	2	1.67
Farm Size		
= 1	32	26.67
1.1 – 2.0	78	65.00
2.1 – 3.0	10	8.33
Access to Extension Services		
Yes	36	30.00
No	84	70.00
Access to Credit		
Yes	47	39.17
No	73	60.83
Forms of Credit		
Cash	37	78.7
Kind	10	21.3

Source: Field survey, 2016

SOURCES OF CREDIT

Table 2 indicates the sources of credit available to the farmers in the study area. The proportion of those who obtained funds from moneylenders was 30.8%, relatives and friends 15.0% and co-operatives 3.3%. This might be an indication that it is easy to obtain credit from informal sources than institutional sources. All the respondents are constrained in obtaining finance from personal savings due to weak financial base. In other to solidify their financial base with assured increased output level, additional sources of funds are therefore required.

Table 2: Frequency and Percentage Distribution of Respondents According to Source of Credit

Source of Credit	Frequency	Percentage
Personal Savings	120	100
Relatives and Friends	18	15.00
Cooperative	4	3.33
Moneylender	37	30.83
Multiple responses allowed		

Source: Field survey, 2016

LOGISTIC REGRESSION ANALYSIS

The factors affecting the use of credit by small-scale Ofada rice farmers in Ijebu North – East Local Government of Ogun State was analysed by Logit regression model. The regression parameters and diagnostic statistics were estimated using the maximum likelihood estimation (MLE) technique.

Table 3 shows from the results that the coefficient of five variables out of nine significantly affected the likelihood of farmers use of credit. On the one hand, years spent in school, farming experience and farmers group

had positive influence, which indicated that an increase in the value of the variables' coefficient tends to increase the likelihood of credit use on Ofada rice production. On the other hand, marital status and household size had negative influence, which implied that an increase in the value of the variable's coefficient tends to decrease the likelihood of credit use on Ofada rice production.

The positive effect of farmers group found in this study corroborates Akinbode (2013) among rice farmers in Niger state. The implication of this is that farmers that belonged to a group enjoyed certain benefits such as market information, credit, and price fixing. As expected, the number of years spent in farming operation increases the experience of the farmer and he is able to learn from past mistakes. This implied that farmers with more years of farming experience are likely to use credit better compared to farmers with less years of farming experience.

The positive sign of the coefficient of education implied that more educated farmers are likely to have better use of credit which would in turn boost their productivity compared with less educated farmers. Educated farmers are likely to have the required courage, boldness and the knowledge required to approach financial institutions for loan. Henri-Ukoha et al (2011) reported that the age of the farmers, level of education, farming experience, farm size, and marital status significantly affect the amount of loan acquired by small-scale farmers in Ohafia agricultural zone of Abia state, south-east Nigeria. It has often been reported that credit use is able to break the vicious cycle of low productivity and poverty common among peasant farmers in developing countries like Nigeria. Continuous and adequate food production on an economically sustainable basis is achievable if farmers are empowered and capable of acquiring the much needed modern agricultural inputs such as fertilizer, insecticides, herbicides, and other implements for farm operations.

Marital status had a negative influence on credit use in Ofada rice production. The study reveals that majority of the respondents are married and tend to have more marital responsibilities which may result in diverting funds meant for production to address family issues and that would eventually lead to a reduction in output. In addition, the fact that women tend

to spend more time taking care of their children and domestic activities than working on farms decreases agricultural production. This inference corroborates with Nuhu *et al* (2014).

Table 3: Logistic Regression Estimates

Access to Credit	Coefficient	Standard Error	Z	P>|Z|
Constant	-1.19086	2.175121	-0.55	0.584
Age	-0.0109286	0.0299796	-0.36	0.715
Gender	-0.1192538	0.626479	-0.19	0.849
Marital Status	-0.8370072*	0.463622	-1.81	0.071
Household Size	-0.3671341**	0.1811899	-2.03	0.043
Years Spent in School	0.215828**	0.087405	2.47	0.014
Farming Experience	0.6683528***	0.1783376	3.75	0.000
Farm Size	0.356202	0.5162813	0.69	0.490
Extension Contact	-0.672726	0.7357816	-0.91	0.361
Farmers Group	1.767092***	0.6467904	2.73	0.006

Source: Field survey, 2016

Number of Observation = 120

Chi Square value =47.560

Log likelihood value = -56.560

Pseudo R^2 = 0.296

STOCHASTIC PRODUCTION FRONTIER

The Cobb Douglass production function was adopted for this analysis compared to the Ordinary Least Square (OLS) functional form since the nature of returns to variable [labour or capital] and returns to scale can simultaneously be assessed. Results of maximum likelihood estimates of the Cobb-Douglas stochastic frontier production model which represent the elasticities of the inputs are given

Stochastic Frontier for Credit Users

The study reveals that X_1 (Seed quantity), X_2 (Total labour), X_3 (Pesticide quantity) and X_4 (Farm size) were found to be positively and negatively signed which indicated a direct and indirect relationship with the output of credit users respectively. The volume of output increases as the input are increased for the positively signed coefficients and the output decreases as the input are increased for the negatively signed coefficients. The coefficients of variables X_1 (Seed quantity), X_3 (Pesticide quantity) and X_4 (Farm size) were significant at 1% level of significance while X_2 (Total labour) was insignificant at any level of significance.

The positive and significant relationship between the variable X_1 (Seed quantity) and output of credit users in the study area implied that as more seeds are used as a result of access to credit facility, there was an increase in the total output of Ofada rice produced. The Variable X_4 (Farm Size) was also a significant factor associated with the changes in output of farmers who used credit in the study. The estimated positive coefficient for pesticide quantity, which is another significant factor at 5% probability level, implied that an increase in the quantity of pesticide used by the Ofada rice farmers led to increase in the quantity of output of Ofada rice produced by the farmers who used credit. This result was corroborated by Akinbode et al (2011), Afolami and Farinola (2011) and Oyewo (2011).

The inefficient variables $Z_1, Z_2, Z_3, \ldots Z_7$ also had both positive and negative signs which indicated a direct and inverse relationship with the efficiency of credit users, meaning that the efficiency increases as they were increased and vice versa. Most of the inefficient variables were not significant at all levels of significance. The coefficients of variables such as gender, household size, years spent in school, farming experience, and membership of farmers' group though not significant, but negative implied that technical inefficiency of credit beneficiaries decreased with increasing values of these variables. In other words, efficiency increases with increasing levels of these variables. Therefore, ofada farmers with large household size, higher educational level, more years of farming experience and those who belonged to farmers' group have lower levels of technical inefficiency. This is in tandem with the findings of Ogundari and Ojo (2007) who found out that education, experience, and credit availability had negative effects on technical inefficiency among small scale food crop farmers in Nigeria.

The positive effect of age implied that the older the farmers are the higher the level of technical inefficiency, which can stem from the fact that older farmers tend to depend more on their experiences, which might have been out of the present methods of farming. The positive co-efficient of the extension contact implies that farmers with less contact with extension agents were technically inefficient. Peradventure, such farmers were not socially connected with cooperative societies that could have been another source of information dissemination. This underscores the importance of extension services in Ofada rice production.

Table 4: Stochastic Results for Credit Users

Explanatory Variable	Parameter	Coefficient	Standard Error	T-ratio
Constant	β_0	179.678	145.089	1.24
Seed Quantity	β_1	4.408	0.859	5.36***
Total Labour	β_2	-8.345	5.832	-1.43
Pesticide Quantity	β_3	6.142	11.714	0.52
Farm Size	β_4	-8.075	193.984	-0.04
Constant	β_0	214.607	8.363	25.66***
Seed Quantity	β_1	4.564	0.347	13.16***
Total Labour	β_2	-1.065	5.424	-0.20
Pesticide Quantity	β_3	7.720	3.547	2.18**
Farm Size	β_4	-8.340	1.082	7.71***
Inefficiency Estimates				
Constant	δ_0	3.756	7.073	0.53
Gender	δ_1	-5.477	10.636	-0.51
Age	δ_2	4.877	7.437	0.66
Household Size	δ_3	-15.994	21.766	-0.73
Years Spent in School	δ_4	-7.934	18.143	-0.44
Farming Experience	δ_5	-15.757	28.205	-0.56
Extension Contact	δ_6	15.553	29.044	0.54
Farmers Group	δ_7	-7.683	14.334	-0.54

Source: Field survey, 2016

** Significant at 5% level ***Significant at 1% level

STOCHASTIC FRONTIER FOR NON-CREDIT USERS

Efficiency analysis of non-credit users in the study reveals that the coefficients of variables X_1 (Seed quantity), X_2 (Total labour), X_3 (Pesticide quantity) and X_4 (Farm size) were found to be positively and negatively signed which indicates a direct and indirect relationship respectively with the output of non - credit users. This means that the volume of output increases as the input is increased for the positively signed coefficients and conversely, the volume of the output decreases as the input is increased for the negatively signed coefficients. The coefficients of variables X_2 (Total labour), X_3 (Pesticide quantity) and X_4 (Farm size) were positively signed while X_1 (Seed quantity) was negatively signed.

The coefficients of variables X_2 (Total labour) and X_4 (Farm size) were significant at 1% level of significance. This agrees with the study of Akinbode *et. al*. (2011). The study identifies that the same variables were positively significant to Ofada rice production. This implies that a unit increase in total labour would probably bring about 9.6 increases in the output of non-credit-beneficiary Ofada rice farmers. This may be because majority of production activities except for pesticide application and winnowing (part of ofada processing) involved the use of family labour and the farmer pays no charge (direct) for their services. More than 60% of land acquired is by inheritance therefore increase in land size for Ofada rice cultivation is pertinent to increasing output of non-credit users since he does not pay any tenancy rent.

The estimated positive coefficient of variable X_3 (Pesticide quantity) although not significant implies that an increase in the quantity of pesticide used by the non-credit-beneficiary ofada rice farmers led to an insignificant increase in the quantity of output of ofada rice produced by the farmers. This agrees with the findings of Wakili and Isa (2015). Negative coefficient of variable X_1 (Seed quantity) contradicts the a priori expectation of increase in the output because of an increase in the quantity of seeds. This could be because the non-credit users do not have access to good and viable seeds, which could be more costly than the less viable ones.

The inefficient variables $Z_1, Z_2, Z_3 \ldots Z_7$ also had both positive and negative signs which indicated a direct and inverse relationship with the efficiency of credit users, meaning that the efficiency increases as they were increased and vice versa. Coefficients of variables Z_2 (Age), Z_3 (Household size) and Z_5 (Farming experience) were significant at 5% significant level while Z_6 (Extension contact) was significant at 10 % level of significance. The positive coefficient of variable age means that as the farmers increase in age, they tend to be technically inefficient in the handling of inputs. This contradicts the a priori expectation that younger farmers who are still agile should be more technically efficient because they can still adopt new technologies and can afford to take risks. The implication of not having access to credit is inability to purchase and use the required inputs at the right time. The significance of the age variable underscores the need for directional policy intervention targeted at young farmers in order to raise rice production efficiency. This result corroborates the findings of Akinbode et al (2011). The positive value of extension contact implies that non-credit users with less contact with extension agents were technically inefficient. This accentuates the importance of extension services in Ofada rice production. However, household size and farming experience implies that non-credit users with large family and more years of farming experience were found to be more technically inefficient than credit-user-farmers with less family members and less years of farming experience. This agrees with the findings of Ogundari and Ojo (2007) who found out that education, experience, and credit availability had negative effects on technical inefficiency among small-scale food crop farmers in Nigeria.

Table 5: Stochastic Result for Non – Credit Users

Explanatory Variable	Parameter	Coefficient	Standard Error	T-ratio
Constant	β_0	13.356	93.787	0.14
Seed Quantity	β_1	-3.221	0.119	-0.27
Total Labour	β_2	12.636	4.881	2.59***
Pesticide Quantity	β_3	-0.132	5.233	2.53***
Farm Size	β_4	361.188	104.725	3.45***
Constant	β_0	51.460	1.153	44.65***
Seed Quantity	β_1	-0.005	0.108	-0.042
Total Labour	β_2	9.631	1.922	5.01***
Pesticide Quantity	β_3	1.107	2.669	0.41
Farm Size	β_4	361.598	1.022	353.75***
Inefficiency Estimates				
Constant	δ_0	-1.201	1.1331	-1.06
Gender	δ_1	2.124	1.408	1.51
Age	δ_2	3.232	1.401	2.31**
Household Size	δ_3	25.657	9.247	-2.34**
Years Spent in School	δ_4	2.445	1.610	1.52
Farming Experience	δ_5	-4.256	2.019	2.11**
Extension Contact	δ_6	10.952	5.771	1.90*
Farmers Group	δ_7	-0.336	1.002	-0.34

Source: Field survey, 2016

*Significant at 10% level **Significant at 5% level ***Significant at 1% level

TECHNICAL EFFICIENCY INDICES

The decile range of the frequency distribution of technical efficiency of respondents is presented in Tables 6 and 7. The predictor -technical efficiency greatly differs among credit users and non-credit users. The result reveals that the least technically efficient farmer who used credit had an efficiency index of 85% while the most efficient who used credit had an efficiency index of 100% which means that credit users were technically

efficient in their use of input related to their output . The mean efficiency for credit users was 97%. The least technically efficient non-credit user had an efficiency index of 91% while the most technically efficient non-credit users had an efficiency index of 91%. The mean efficiency for non-credit users was 82%. From the foregoing, it can be seen that credit users were technically efficient in their use of inputs related to their output than the non-credit users. The implication of the result is that timely delivery of loan encouraged judicious credit use for input procurement and hence increased the technical efficiency.

Table 6: Distribution of Credit Users by Range of Technical Efficiency

Technical Efficiency	Frequency	Percentage
0.81 – 0.85	1	2.13
0.86 – 0.90	4	8.51
0.91 – 0.95	4	8.51
>0.95	38	80.85
Total	47	100

Source: Field survey, 2016

Table 7: Distribution of Non- Credit Users by Range of Technical Efficiency

Technical Efficiency	Frequency	Percentage
0.81 – 0.85	62	84.93
0.86 – 0.90	6	8.52
0.91 – 0.95	5	6.85
>0.95	0	0.00
Total	73	100

Source: Field survey, 2016

CONSTRAINTS FACING SMALL-SCALE OFADA RICE FARMERS

Table 8 reveals that farmers who were constrained stated that high interest rate charged by banks and moneylenders was a major factor militating against their access to loan. Others claimed that lack of collateral (36.7%), incorrect filling of form (20.8%), and lack of trust (45%) restrained them from obtaining the credit facility. Most (44%) of the farmers did not benefit from the expertise of the extension agents from their local governments. The main reason for this was inadequacy of the extension agents as well as limited frequency of visit. These results corroborate research results recorded by Akinbode 2013.

Table 8: Frequency and Percentage Distribution of Respondents According to Credit and other Constraints

Credit Constraint Factor	Frequency	Percentage
Incorrect filling of form	25	20.83
No Guarantor / Collateral	44	36.66
Lack of trust	54	45.00
High interest rate	83	69.17
Extension visits	44	36.66
Multiple responses allowed		

Source: Field survey, 2016

CONCLUSION

This study has shown that majority of the respondents in the study area were in their active age. In addition, they were more male respondents than females and most of the respondents were married. The result reveals that 65% of the farmers do not have access to credit facilities and some do not belong to farmers' group, which assists in the mobilization of credit. Management improvement measures such as education and training of the farmers are required to improve ofada rice production in the study area as the average number of years spent in school is considerably

low. It can be concluded that there is a wide gap between the technical efficiencies of credit users and non-credit users with the average technical efficiencies of 81% and 97% respectively. The study further concludes that appropriate and timely delivery of credit increases its usage for intended ofada rice production and thus positively increases the efficiency.

RECCOMENDATIONS

Based on the findings in the study area, the following are recommended:

1. Credit should be provided to farmers by the government in the form of agricultural input subsidies. Such inputs like fertilizers, herbicides, insecticides, and tractors for hiring should be delivered timely when it will be useful for rice farming operations. Farmers with more years of experience should be given greater priority.

2. Extension services should be strengthened to cover more villages and settlements. Also, results of better researches on improved agronomic practices should be shared to the farmers in this area by the extension agents.

3. Policies should be fashioned out to encourage young and educated farmers to go into Ofada rice production. Such farmers are also encouraged to take into consideration the advice of the adequately trained extension agents on improved techniques of rice production such that there will be increase in yield per hectare.

4. An effective borrowing system and other possible benefits would encourage farmers to join farmers' group. Thus, these benefits should be propagated so that more farmers can be encouraged to join the groups.

5. Adult literacy programmes should be made available to non-literate farmers in order for them to be able to adequately absorb the new farming methods such as spacing, family planning, integrated pest management and so on.

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