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Full Length Research Paper

Are Beneficiaries of Bank of Agriculture (BOA) Loan Scheme, Technically Efficient in North Central Nigeria

Cyprian Clement Abur

Economic Policy Research Department, Nigerian Institute of Social and Economic Research, Ibadan.

Author's E-mail: aburcyprian@yahoo.com

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This study investigates the impact of profitability and technical efficiency among rice farming households beneficiaries of BOA loan scheme in Benue state. Primary and secondary data were used while methods employed for analyzing data include; descriptive statistics, gross margin analysis and stochastic frontier production model. Results from descriptive statistics shows that a good number of farmers had formal education despite their years of experience and farmers were operating on 1-3 hectares of land due to inadequate loan to fund large scale production. Rice farmers after becoming beneficiaries of BOA loan scheme were found to be operating at lower technically efficiency as compared to when they were not beneficiaries of BOA loan scheme. The study concluded that, access to loan is not a guarantee for higher technical efficiency; hence borrowing (a mark of access to loan) may allow farmers to respond to households needs rather than input market to increase productivity. Based on the findings, farm – specific factors such as education needs to be sustained, this would enable farmers make better technical decision on how to allocate production input effectively.

Keywords: Bank of Agriculture, technical efficiency, rice farming household, productivity.

1 INTRODUCTION

As development takes place, one question that arises is the extent to which credit can be offered to farmers to facilitate their taking advantage of the adoption of modern technologies for efficient production (Olagunju, 2007). This is because majority of the farmers lack fund to improve their farm productivity as they are faced with alternatives either to access loan from formal or informal financial institutions. CBN (2010) posited that the formal financial system provides services to only 35% of the economically active population who are mostly farmers while the remaining 65% are excluded from access to financial services. These financially excluded, are often served by the informal sectors finance through Non-Governmental Organization Microfinance Institutions (NGO-MFIs), money lenders, friends, relatives and credit unions. This informal sector finance are unreliable, inadequate in supply and charges higher interest rate. In order to enhance financial inclusion and at the same time the flow of efficient financial services to farming households, government in the past initiated series of financial credit programmes and policies targeted at small-holder farmers (CBN, 2005). Despite government efforts in increase access to loan by rural farming households, the question is whether these instituted publicly-financing credit programmes and policies achieved the set goals remains an important policy issue. For these reasons, the study tends to provide answers as to whether or not rice farming households before and after becoming beneficiaries of BOA loan scheme, are technically efficient? This paper is structured into five sections. After this introduction, literature review presents theoretical foundation for empirical research while the methodological procedures section describes the method employed for analysis. The next section discusses results and the last section concludes and suggests policy recommendations.

2. LITERATURE REVIEW

Technical efficiency refers to the ability of producing a given level of output with a minimum quantity of inputs under a given technology. Allocative efficiency refers to the choice of the optimal input proportions given relative prices. Economic or total efficiency is the product of technical and allocative efficiency. Farrell's model of deterministic nonparametric frontier attributes to any deviation from the frontier as inefficiency and imposes no functional form on the data. Several extensions of Farrell deterministic model have been made by economists such as Aigner and Chu (1968) and Battese (1992) among others. Thus, Battese (1992), showed a more general presentation of Farrell's concept of the production function (or frontier) as depicted in Figure 1 involving the original input and output values. The horizontal axis represents the (vector of) inputs X associated with producing the output Y. The observed input-output values are below the production frontier, given that farms do not attain the maximum output possible for the inputs involved, given the technology available, the measure of the technical efficiency of the farm which produces output Y with inputs X denoted by point A, is given by Y/Y^*, where Y^* is the "frontier output" associated with the level of inputs, X (see point B). This is a measure of technical efficiency, which is dependent on the levels of the inputs involved. Empirical estimation of efficiency is normally done with the methodology of stochastic frontier production function. The stochastic frontier production model has the advantage of allowing simultaneous estimation of individual technical efficiency and the inefficiency effect of the farmers (Battese, 1992). The ideas of production function can be illustrated with a farm using n inputs: X_1, X_2,……, X_n, to produce output Y, efficient transformation of inputs into output is characterized by the production function f (X), which shows the maximum output obtainable from various inputs used in production. The stochastic frontier production function independently proposed by Aigner and Chu (1968) assumes that maximum output may not be obtained from a given input or a set of inputs because of the inefficiency effects. It can be written as:

$$Y_i = f(Xa_i;\beta) + \varepsilon_i \quad \text{...} \quad (1)$$

Where, Y_i is the quantity of agricultural output,
Xa_i is a vector of input quantities and,
is a vector of parameters
ε_i is an error term defined as:

ε_i = Vi – Ui i = 1, 2, … n farms ……… ………… ………… …………. ……(2)

V_i is a symmetric component that accounts for pure random factors on production, which are outside the farmers' control such as weather, disease, topography, distribution of supplies, combined effects of unobserved inputs on production etc. and U_i is a one-sided component, which captures the effects of inefficiency and hence measures the shortfall in output Y_i from its maximum value given by the stochastic frontier f(Xa;β)+ V_i. The model is expressed as:

$$Y_i = \exp\ (X_i\beta + V_i - U_i) \quad \text{...} (3)$$

The technical efficiency of production of the *i*-th farmer in the appropriate data set, given the levels of his inputs, is defined by:

$$TE_i = \exp\ (-U_i) \quad \text{..} (4)$$

From equations (3) and (4), the two components V_i and U_i are assumed to be independent of each other, where V_i is the two-sided, normally distributed random error ($V_i \sim N(0, \sigma_v^{\ 2})$, and U_i is the one-sided efficiency component with a half normal distribution ($U_i \sim / N(0, \sigma_u^{\ 2})$. Y_i and X_i are as defined earlier. The β's are unknown parameters to be estimated together with the variance parameters. The variances of the parameters, symmetric V_i and one-sided U_i, are $\sigma_v{}^2$ *and* $\sigma_u{}^2$ respectively and the overall model variance given as σ^2 are related thus:

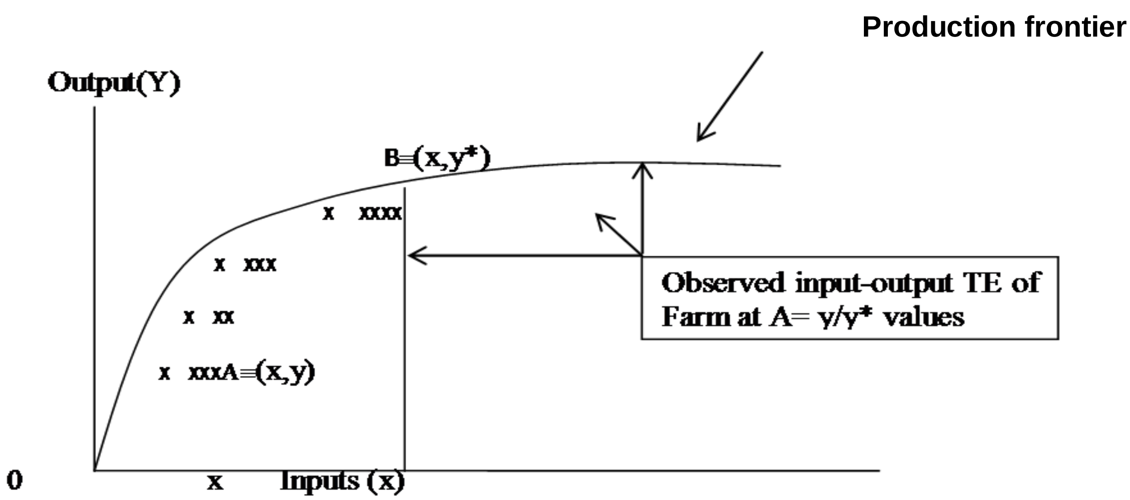
$$\sigma^2 = \sigma_v{}^2 + \sigma_u{}^2 \quad \text{...(5)}$$

The measures of total variation of output from the frontier, which can be attributed to technical efficiency, are lambda (□) and gamma (□) (Battese & Coelli, 1995) while the variability measures derived by Aigner and Chu, (1968), are presented by equations (4) & (5):

$$\lambda = \frac{\sigma_u}{\sigma_v} \quad \text{…………………………………………………………… (6)}$$

$$\gamma = \frac{\sigma_u{}^2}{\sigma_v{}^2} \quad \text{……………………………………………………… (7)}$$

On the assumption that V_i and U_i are independent and normally distributed, the parameters β, $\sigma^2, \sigma_u{}^2, \sigma_v{}^2$, λ *and* γ can be estimated by method of Maximum Likelihood Estimates (MLE), using the computer program FRONTIER Version 4.1 (Coelli, 1996). This computer program also computes estimates of technical and allocative efficiencies.



The farm specific Technical Efficiency (TE) of the i^{th} farmer can be estimated using the expectation of U_i conditional on the random variable (δ_i) as shown by Battese (1992). The TE of an individual farmer is defined in terms of the ratio of the observed output to the corresponding frontier output given the available technology, that is:

$$TE_i = \frac{Y_i}{Y_i^*} = \frac{\exp(X_i\beta + V_i - U_i)}{\exp(X_i\beta + V_i)} = \exp(-U_i) \qquad (8)$$

So that: O≤ TE ≤1

The use of the stochastic frontier analysis in the study of agriculture credit in Nigeria is a recent development. Ike and Udeh (2011) examined the relative allocative efficiencies in input use by credit user and non-credit user small scale poultry farmers in Delta State, Nigeria. Primary data were collected from a random sample of 108 small scale poultry farmers consisting of 54 credit users and 54 non -credit users. The result shows that credit user over utilized labour and under- utilized feed input as well as drugs and veterinary services. Ibrahim and Bauer (2013) have analyzed the impact of micro-credit on rural farmers' profit taking a case of Dryland of Sudan employing the Heckman Selection Model to analyze the responses from 300 samples. The findings from the study affirm the fact that farmers with access to credit are better off compared to those who do not have such access. Rahman, Hussain & Taqi (2014) emphasizes agricultural credit as a major determinant of farm productivity. Their study utilizes logistic regression method on the 300 samples from Bawhalpur, Pakistan. With the positive association between credit and agricultural productivity, they conclude that timely provision of appropriate amount of loan to farmers is helpful for the enhancement of agricultural productivity as it enables them to purchase high yielding variety seeds, fertilizers and pesticides. Duy (2012) investigated the impact of agricultural credit on farm productivity taking a sample of 654 farmers from Mekong Delta region of Pakistan by using quintile regression and Stochastic Frontier Analysis (SFA) techniques. The study concludes that technical efficiency and rice yield were positively influenced by access to credit, education level and farm technology. Akram, Hussain, Sabir & Hussain (2013), observes that access to credit results in a higher level of technical efficiency of farmers. Their study is based on a sample survey of 152 farmers from Sargodha District of Punjab Province of Pakistan. Using stochastic frontier analysis (SFA), the study concludes that agricultural credit in the study area helped the farmers obtain the farm inputs in time, resulting in a higher level of technical efficiency.

3. METHODOLOGY

3.1 Population and Sample Size

The population for the study comprises of rice farming households who are beneficiaries of Bank of Agriculture (BOA) loan scheme in Benue State for the 2016 cropping season. According to Bank of Agriculture headquarter in Benue state (2016), five hundred and ten beneficiaries were rice farming household spread within the three senatorial districts as presented in Table 1.

Table 1: The Study Population

S/No.	Senatorial District	Population Size
1	Zone A	175
2	Zone B	218
3	Zone C	117
Total		**510**

Source: *BOA (2018).*

This study adopts the Yard formula propounded by Taro Yamane (1967) to determine the right sample size for this study. The formula states that:

$n = N/1+N\ (e)^2$

Where,

n = the required sample size

N = the population size

e = limit of tolerable sampling error (level of significance).

From the total study population of 510 farmers, the confidence level is set at 95 % and the tolerable error is set at 5 %. Using the equation, the researcher calculates the required sample size for the study as follows:

n =?

N =510

e = 5% (0.05)

Therefore, $n = 510/1+510\ (0.05)^2$

n = 510/1+510 (0.0025)

n = 510/1+1.275

n =510/2.3

n = 222.

Thus the total sample size for this study is 222 beneficiaries of BOA loans who are rice farming households in the study area**.** To ensure randomness, the Bourley's 1964 population allocation formula in Nzeribe and Ilogu (1999) was used to determine the individual sample size. The formula is stated as follows:

nh = nNh/N Where,
nh = the sample size per each agricultural zone
n = the total sample size
Nh = the number of rice farming beneficiaries in each zone
N = the population size/total study population.
The required individual sample size per each senatorial zone is calculated proportional as shown in Table 2.

Table 2 : Determination of Individual LGAs Sample Size

S/No.	***Senatorial Zone/LGA***	***Nh***	***nh***
1	Zone A: Kwande LGA	175	76
2	Zone B: Guma LGA	218	95
3	Zone C: Agatu LGA	117	51
Total		**N= 510**	**n=222**

Source: *Field Survey (2018).*

3.2 Data Collection

The data for this study were collected mainly from primary sources while three sampling techniques were used. Firstly, multistage sampling method was employed to identify one branch of BOA and a local government area selected in each of the three senatorial Zones, hence, Benue state is clustered into three (3) senatorial zones. Secondly, simple random sampling procedure was employed to select 76 (seventy five) rice farming households who were beneficiaries of BOA in Kwande Local Government Area (LGA) of Zone A while 95 (ninety four) and 51 (fifty) were selected in Guma and Agatu local government area of Zone B and C respectively. In each of the Local Government Area (LGA) selected, four rice producing council wards where BOA loan scheme beneficiaries are prevalence were purposively selected. The council wards in Kwande LGA includes; Menev (19), Mbaikyor (19), Usar (19) and Yaav (19) while council wards in Guma LGA selected were Kaambe (24), Mbabai (23), Nzorov (24) and Uvir (24), whereas the council wards selected in Agatu LGA were Ogbaulu (13), Odugbeho (13), Obagaji (12) and Enungba (13). Structural questionnaire was used to collect cross sectional data from respondents including; input-output data of the rice farming household defined within economies of scale. The output data include yield of rice in kg. The input data include cost of labour, cost of fertilizers, and cost of seed and cost of herbicide. Data were also collected on the socio economic variables such as age, gender, marital status, years of formal education, amount of credit, farm size and the farming experience. The questionnaires were given to educated farmers to fill while uneducated ones were interviewed orally using native research assistants for interpretations.

3.3 Techniques of Analysis

Two techniques were used to analyze the data collected. These are: Firstly, descriptive statistics consisting of simple percentages and proportions was used to examine the socio-economic characteristics of rice farming household who beneficiaries of BOA loan scheme. Secondly, the study applied the Stochastic Frontier Production (SFP) model to determine farm efficiency following Ayaz and Hussain (2011), they applied SFP estimation technique in the analysis of production efficiency of the farming sector in the Punjab province of Pakistan. By extending their model, the stochastic frontier production function was specified as follows:

$LnY_i = Ln\beta_o + \beta_1 LnX_1 + \beta_2 LnX_2 + \beta_3 LnX_3 + \beta_4 LnX_4 + \beta_5 LnX_5 + U_i - V_i$ ……… (9)
Where:
Yi = rice output of the ith farming household in kg
X_1 =hired labour in mandays
X_2 = quantity of fertilizer used in kg
X_3 = farm size in ha
X_4 = quantity of seed planted in kg
X_5 = cost of herbicides in Naira
β_o = the intercept term which represents the average physical product (A measure of the efficiency of technology adopted by the ith farmer);
$\beta_1, \beta_2, \ldots, \beta_6$, are the slope terms representing the elasticity's of production for the different inputs used by the ith farmer.
$e_i = V_i - U_i$ = Error term
V_i = random variable which is assumed to be independently and identically distributed, $N(O, \delta^2_v)$ and independent of U_i.
U_i = Non-negative random variable associated with technical inefficiency in production, and is assumed to be identically and independently distributed half normal $N(\mu, \delta^2_u)$ and the inefficiency model is explicitly expressed as
$\mu i = \sigma_0 + \delta_1 \ln Z_i$ ……………..…………………………………………………(10)
δ_1 = age of the household head (in years);
δ_2 =experience of the head of household in rice farming (in years);
δ_3 =formal education level of the head of household (in years); and
δ_4 =farm size of the household head (in years);
δ_5 =gender of the household head
Where, Z_i = Vector of variables that may influence the efficiency of an individual farm δ_1 = Vector of parameters to be estimated
The estimates of all the parameters of the stochastic frontier production function and the inefficiency model were obtained using the program FRONTIER version 4.1 (Coelli, 1996).

Returns to scale

Finally, the return to scale is measured by adding together the regression coefficient of estimated function of all explanatory variables in Cobb-Douglas production function. Mathematically,

$$RTS = \sum_{j=1}^{n} b_i$$

where
RTS = Return to scale
n = Number of regressors
b_i = Regression Coefficient
RTS > 1 implies increasing return to scale
RTS < 1 implies decreasing return to scale
RTS = 1 implies constant return to scale.

4. RESULTS AND DISCUSSION

4.1. Socio-economic Characteristics

The respondents' socio-economic characteristics are summarized in Table 3. The result revealed that average age of the respondents was 54.5 years with majority (54%) aged 60 years and above. This implied that rice farming household in Benue state were dominated by the old men and women who had inadequate energy to tackle the challenges of rice production. Furthermore, majority were males (51%), this could be that male farmers are more suited to withstand the rigors associated processes of rice production while (51%) of the farmers acquired either secondary school education or above. This implies that good number of farmers in the study area had formal education. These tend to be in line with the findings of Duy (2012), that the rice farmers are educated. Further finding on socio-economic factors showed that majority (53%) of the farmers were small scale subsistence farmers because they were operating on 1-3 hectares of land. The reason could be that lack of adequate credit facilities hinders them to fund large scale production operation.

Table 3: Socio-economic Characteristics of beneficiaries of BOA loan who are Rice Farming Household

Variable	No of Respondents	Percentage	Mean
Gender			
Male	113	51	
Female	109	49	
Total	**222**	**100**	
***Age* (years)**			
20- 39	20	9	54.5 years
40- 59	82	37	
≤ 60	120	54	
Total	**222**	**100**	
Educational level			
Primary Education	41	18	
Secondary Education	113	51	
Tertiary Education	68	31	
Total	**222**	**100**	
Farm size			
1-3 ha	117	53	1-3 ha
4-6 ha	85	38	
6ha and above	20	9	
Total	**222**	**100**	

Source: *Computed from Field Survey Data, 2018.*

4.2 Stochastic Frontier Production Analysis

Technical efficiency indexes

The gamma (γ) which measures the effect of technical inefficiency in the variations of observed output had values 0.854 and 0.985 for farmers before and after becoming beneficiaries of BOA loan scheme respectively, and significant at $\rho < 0.05$ as indicated in Table 6. This suggests that the systematic influences that are unexplained by the production function are the dominant sources of random errors. That is the existence of technical inefficiency among the sampled farmers' accounts for about 85% and 99% of the variation in the output of rice grown for farmers before and after becoming beneficiaries of BOA loan scheme respectively. This implies that 15% and 1% of the differences between the observed and maximum production frontier output were due to differences in farmers' level of technical efficiency and not related to random variability.

The sources of inefficiency were examined by using the estimated δ coefficients in Table 6. The contribution of farmers' personal characteristics such as: level of education, age, years of farming experience and household size to farm inefficiency was also studied. If the dependent variables of the inefficiency model have a negative sign on an estimated parameter, it implies that the associated variable has a positive effect on efficiency, and a positive sign indicate that the reverse is true. Before becoming BOA loan scheme beneficiaries, farmers' personal characteristics: level of education, gender, farming experience and household size had negative relationship and significant effect. The negative coefficients imply that these variables have the tendency of reducing the technical inefficiency (or increasing the technical efficiency) level of the farmers, only age had positive relationship with technical inefficiency, the positive coefficient implies that the variable has the effect of increasing the level of technical inefficiency in rice farming. Any increase in the value of the variable (age) would lead to an increase in the level of technical inefficiency. This could be that older farmers tend to be more conservative and less receptive to modern and newly introduced agricultural technology thereby resulting to inefficiency.

After becoming beneficiaries of BOA loan scheme, education and farm experience had negative relationship and significant effect on technical inefficiency. The negative coefficient and significant effect of education implies that, the farmers' level of technical inefficiency declined with more education. These results are in conformity with previous works by Ike and Udeh (2011). The negative coefficient and significant effect of farm experience implies that farmers with more years of farming experience tend to be more efficient in rice production. This conforms to the findings of Coelli and Battese (1996) who reported negative production elasticity with respect to farming experience for farmers in two villages in India, thus suggesting that farmers gained more years of farming experience through "learning by doing," and thereby becoming more efficient. However, household size and age have negative sign but statistically not significant. This implies that farmers' personal characteristics do not contribute to farm inefficiency. Since these variables were not significant, they do not deserve further discussions.

Technical Efficiency Rating

The estimation of technical efficiency rating for individual rice farming household in Table 7 reveals that more than 97 percent of rice farmers before becoming beneficiaries of BOA loan scheme recorded technical efficiency of over 85 percent. While more than 92 percent of rice farmers after becoming BOA credit beneficiaries had technical efficiency of over 85 percent. Rice farmers before and after becoming BOA credit beneficiaries had minimum technical efficiency of 0.482 and 0.466, maximum being 0.991 and 0.988 while mean technical efficiency are 0.942 and 0.917 respectively. The result shows that rice farmers after becoming beneficiaries of BOA loan scheme were found to be operating at a lower technically efficiency as compared to when they were not beneficiaries of BOA loan scheme. This may implies that access to loan is not a guarantee for higher technical efficiency; hence borrowing (a mark of access to loan) may enable farmers to respond to household needs rather than input market to increase productivity.

Returns to Scale

The nature of return to scale is calculated by adding together all production elasticities of all the variable resources in Cobb-Douglas production function. The result indicates that after becoming beneficiaries of BOA loan scheme, rice farming household were operating on stage I of production surface portraying increasing returns to scale (1.30) while farmers before becoming beneficiaries of BOA credit scheme were in stage II, the rational stage of production and exhibit decreasing returns to scale (0.40) as indicated in Table 6, which is characteristic of small-scale peasant farming. This suggests that, if more resources are proportionately used by farmers in production process, increased output will be obtained. That is productivity could be increased by raising technical efficiency through increased input usage.

Table 6: Maximum-likelihood Estimates Parameters of the Stochastic Frontier Model and Diagnostic statistics

Production Function	***Before becoming beneficiaries of BOA Loan Scheme***			***After becoming beneficiaries of BOA Loan Scheme***		
Variable	**Coefficient**	**S.E**	**t-ratio**	**Coefficient**	**S.E**	**t-ratio**
Constant β_0	0.201	4.454	452.146	0.406	1.000	4058.76
Labour β_1	0.713	5.394	0.000	-0.087	10.508	0.000
Fertilizer β_2	0.139	8.142	0.000	0.647	3.048	0.000
Farm size β_3	0.074	72.473	0.006	0.444	0.460	0.016
Seed β_4	0.129	0.340	0.471	0.389	0.397	0.000
Herbicide β_5	0.595	1.926	0.345	0.427	1.000	0.000
Inefficiency Model						
Constant δ_0	1.092	1.794	0.542	-158.470	7214.414	0.982
Age Z_1	0.121	0.362	0.001	-47.282	1818.975	0.979
Farm Experience Z_2	-0.204	0.433	0.001	-0.164	0.061	0.008
Formal Education Z_3	-0.734	0.479	0.001	-0.910	0.049	0.000
Household size Z_4	-0.115	236.817	0.485	-48.300	1818.962	0.979
gender Z_5	-0.636	0.755	0.030	-41.855	1808.7	0.982
Return to Scale	**0.40**			**1.30**		
Diagnostic statistics						
Sigma squared (δ^2)	0.306	0.000		0.629	0.000	
Gamma γ	0.854	0.000		0.985	0.001	
Log likelihood Function	-0.136			-0.692		
LR test	0.132			0.417		

Statistical Significance at 5% level

Source: *Computed from Field Survey Data, 2018*

Productivity Analysis

Table 6 shows that the coefficient of labour (β_1) was significant and had positive sign for farmers before becoming beneficiaries of BOA loan scheme. This shows the importance of labour in farming, particularly in Nigeria where mechanization is only common in big commercial farms while after becoming beneficiaries of BOA loan scheme, the coefficient of labour (β_1 =-0.087) had a negative sign implying that increase in labour by 100% will decrease output by 87%. The production efficiency of output with respect to quantity of fertilizer (β_2) was about 0.139 and 0.647 and statistically significant at 5% critical level for both before and after becoming beneficiaries of BOA loan scheme respectively. This implies that an increase in quantity of fertilizer by 100%, output level will improve by a margin of 13.9% and 64.7% before and after becoming beneficiaries of BOA loan scheme respectively. The estimated coefficient of farm size (β_3) is positive and statistically significant at 5% level. The estimated elasticity of the coefficient of farm size (β_3) was 0.074 and 0.444 before and after becoming beneficiaries of BOA loan scheme respectively, meaning that for a 100% increase in the use of land will increase output by about 7.4% and 44% respectively, for the rice farming household. The coefficient of seed (β_4 0.129 and 0.389) and cost of herbicide (β_4 0.595 and 0.427) among the rice farming households before and after becoming BOA loan scheme respectively was positive but not significant for rice farming households before becoming BOA loan scheme but significant after becoming BOA loan scheme, meaning that 100% increase in seed and cost of herbicide will improve output by 39% and 43% respectively.

Table 7: Technical Efficiency Rating

Efficiency Level	***Before becoming beneficiaries of BOA credit scheme***		***After becoming beneficiaries of BOA credit scheme***	
	Frequency	Percentage	Frequency	Percentage
≤0.80	2	1	5	2
0.81- 0.85	5	2	12	6
0.86- 0.90	20	9	25	11
0.91-0.95	120	55	137	63
≥0.90	72	33	40	18
Total	**219**	**100**	**219**	**100**
Minimum Efficiency	0.482		0.466	
Maximum Efficiency	0.991		0.988	
Mean Efficiency	0.942		0.917	

Source: *Computed from Field Survey Data, 2018*

5. CONCLUSION AND POLICY RECOMMENDATIONS

The study concludes that good number of farmers in the area had formal education, despite the number of years of experience acquired, rice farming household were found operating on 1-3 hectares of land due to inadequate credit facilities to fund large scale production. Furthermore, rice farmers after becoming beneficiaries of BOA loan scheme were found to be operating at a lower technically efficiency as compared to when they were not beneficiaries of BOA loan scheme. Based on the study findings, farm – specific factors such as education needs to be sustained. As this would enable farmers make better technical decision on how to allocate production input efficiently, especially when targeted at farmers who have had no formal educational opportunities through up scaling. The study also recommends that rice farmers should prudently invest on farm activities, no matter how small their income or loan granted to them may be, so that farmers can obtain adequate inputs as at when due to ensure efficient utilization of farm input.

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