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Production Efficiency among Farm Credit and Non Farm Credit Users in the Smallholder Farming Systems of Rivers State, Nigeria

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ABSTRACT The main objective of this study is the determination and comparison of production efficiency of Farm Credit and Non Farm Credit Users in Rivers State. Cross- sectional data generated from 200 Farm Credit and Non Farm Credit Users randomly selected from ten out of the fifteen upland Local Government Areas were used. Production function analysis and analysis of covariance technique was used in analyzing the data. Results of data analysis showed that Farm Credit Users were technically more efficient than Non Farm Credit Users. The results further showed that none of the defined farmer groups achieved absolute allocative efficiency in the use of any resource input. It is therefore recommended that policies and programmes geared towards making more land available be put in place. Credit facilities should also be extended to the Non Farm Credit Users to enable them purchase improved planting materials and hire more farm hands. This will enhance the productivity of non credit users and boost the economic development of Rivers State in general.

INTRODUCTION

Available statistics from World Trade Organization (WTO) show that agriculture accounts for more than one-third of export earnings of 50 developing countries, (WDI 2006). The sector also plays a crucial role in rural development of most developing economies, employing up to 80 percent of the rural labour force. Agriculture also sustains the growing population, stimulates growth and employment in the agro-allied industry. However, the performance of the sector when compared with its potential in economic development has not been satisfactory. For instance, in Africa, agricultural growth has been estimated at 1.7 percent (Diom 1996).

Similarly, in Nigeria, its value added to GDP has declined from 28.8 percent and 26.4 percent in 2000 and 2003 respectively to as low as 16.6 percent in 2004 (WDI 2006). The role of financial resources as a factor of production to induce economic growth and development as well as need to channel these resources to the agricultural sector of the economy for economic empowerment cannot be overemphasized. Because returns to investment are usually low in smallholder agriculture, savings are also low and credit becomes an important source of financing agricultural and economic development. Credit is a device for facilitating the temporary transfer of purchasing power from one individual or organization to another (Mellor 1966). It is the monetization of promises and exchanging of cash in the present for a promise of a future reciprocity (Von Pischke 1991). Therefore, farm credit could be defined as the present and temporary transfer of purchasing power from an individual or corporate organization who owns it to a person who needs it, allowing him the opportunity to command another person's capital for farm purposes but with confidence in his willingness and ability to repay at a specified later date.

Credits availability, and the efficiency of their utilization in the smallholder farming systems are two sides of the same coin. If credit is available but cannot be accessed by the smallholder farmers due to the existence of structural rigidities in credit administration, then the needed economic development will not be realized. Omanukwue (2007) argued that restricted access to finance, dearth of agricultural inputs, inefficient market systems and continued use of traditional agricultural techniques are among the factors responsible for low agricultural growth and development. Adequate supply to, and use of credit by smallholders is considered essential to agricultural modernization and farm productivity (FMED 1975; FMNP 1981). Farm credit is not only for crop farming but also for related farm level economic activities. It encourages diversified agriculture which stabilizes and increases resource productivity, agricultural production, value added and net incomes of farmers (Desai et al. 1993). It must have been this understanding that informed and accounted for

the various reforms in the financial sector, ostensibly to increase accessibility to credit for the smallholder farmers. For instance, in the 1990s, Nigerian's financial policies were designed to ensure the stability of the financial system and thereby guarantee the flow of credit to all the economic sectors, including agriculture. In order to enhance the flow of credit from the banking sector to agricultural sector, the share capital of the Agricultural Credit Guarantee Scheme Fund (ACGSF), which had been established in 1977 to guarantee 75% of any default in bank loans granted to the agricultural sector, was increased from the initial N100 million to one billion and three billion in 1999 and 2001 respectively. This was also followed by an upward review of credit limits from N5000 to N20, 000 for guaranteed non-collaterized loans to individuals and from N100, 000 to N1, 000,000 for collaterized loans to individuals between 1977 and 2001 (CBN 2003). But Njoku et al. (1991) argued that success in this direction has been limited, while CBN (2003) claimed that although these reforms have redressed, to a considerable extent, the abuses inherent in credit rationing, the issue of inadequate accessibility to credit by farmers has persisted. According to them, interest rate charged has remained high and constrained demand for credit by farmers whose returns have remained low. The high interest rates charged because of the degree of risk divert credits to the speculative activities of the economy, to the detriment of production, capital formation and employment (Adenuga et al. 2007). In the rural area, agricultural production techniques have not developed, due to the rationing of credit whereas most production activities take place in this area. The low value-added resulting from such a situation leads to the scarcity of resources at the local level which, in turn, reduces productivity in the productive sectors.

In Rivers State, especially among the fifteen upland Local Government Areas (LGAs), their major occupation is farming. While NDDC (2006) asserted that the rural inhabitants of the Niger Delta are predominantly small scale farmers, Ojimba (2006) claimed that Crop farmers in Rivers State who produce only crops constituted about 60.13% of the farming population while the rest (about 40%), combined crop farming with either fishing, trading, civil service jobs (including teaching), private companies employees and others such as artisans. As pointed out earlier, the role of financial resources as a factor of production to induce economic growth and development especially in the rural areas, as well as the need to channel these resources to the agricultural sector of the economy of Rivers State for economic empowerment and increased productivity cannot be overemphasized. More so, NDDC (2006) asserted that the extent to which the potential of the agricultural sector in the Niger Delta can be harnessed hinged on the success of agricultural modernization in the face of serious deficiencies in socio-economic and physical infrastructure. As pointed out earlier, the need to increase accessibility to farm credit for the smallholder farmers in Nigeria in general, informed and accounted for, the various reforms in the financial sector. One may wish to ascertain if there is any significant difference in the level of efficiency recorded by these farm credit users who benefited from these financial reforms in Rivers State, vis-à-vis their non credit user counterparts.

The need has therefore arisen to examine the production efficiency of credit and non credit users in Rivers State to enable us isolate and discuss the factors that accounted for the level of production efficiency so identified and to delineate appropriate policy measures.

RESEARCH METHODOLOGY

Data Collection

Multistage purposive sampling technique was used in the data collection. There are 23 Local Government Areas (LGAs) in Rivers State. Fifteen of these LGAs were purposively selected for the study because they constitute the upland (Abua/ Odual, Ahoada East, Ahoada west, Emohua, Eleme, Etche, Omuma, Gokana, Ikwerre, Khana, Obio/Akpor, Ogba/Egbema,/Ndoni, Oyigbo, Port Harcourt and Tai)) while 8 are Riverine. The predominance of land or rivers/ creeks guided this division. From these fifteen upland LGAs, ten were randomly selected. The LGAs selected included Emohua, Etche, Ahoada East, Ahoada West, Ikwerre, Obio/Akpor, Eleme, Oyigbo, Omuma, and Gokana. From the list of communities that make up these 10 LGAs, one community was randomly selected. This gave a total of ten communities. From the list of smallholder farmers collected through the

assistance of the extension agents, 10 farm credit users were randomly selected. This gave a total sample size of 100 farm credit users. Similarly, another 10 non farm credit users were randomly selected from each of the ten communities. This gave another sample size of 100 non farm credit users. Using well structured questionnaires and interview schedule, relevant data were sought from the respondents. The interview schedule enabled the researchers to extract relevant data from all the respondents.

Data Analysis

Production efficiency has two aspects technical efficiency and allocative efficiency. Technical efficiency is the ability of a given set of entrepreneur to employ the best practice in an industry such that not more than the necessary amount of a given resources is used in producing the "best" level of output. Technical efficiency and allocative efficiency of resource use is analyzed by production function and application of Chow's (1960) analysis of covariance technique. The production function or model employed in its implicit or general form is as follows:

$Q = f(X_1, X_2, X_3, X_4, U)$ …..……. (1)

Where

Q = Naira value of total output in either of the two farm types.

X_1 = Farm size (Hectare)

X_2 = Labour input (man days)

X_3 = Cost of planting materials (Naira)

X_4 = Capital input (depreciation and interest charges in Naira)

U = Disturbance term.

Four functional forms (linear, semi log, double log and exponential functions) were fitted to the data and the best fit selected based on the sign and size of the estimated parameters and the magnitude of the coefficient of multiple determination (R^2). Chow's test was used in making inference about the relative technical efficiency among the two types of farmers. The lead equation of the production function estimated here was used. If the production function is stable across the two types of farms as given by the slope or behavioural coefficients in the form of elasticity measure, then technical efficiency is statistically the same. This method is consistent with Anyanwu (1993), Onyenweaku et al. (1996), and Anyanwu (2003).

The following procedure was adopted:

(1) The null hypothesis is stated as

(i) bo = Bo

That is, there is no significant difference between the coefficients obtained from the two production functions. The alternative hypothesis is that there is a significant difference in the coefficients obtained from the two production functions.

(2) Pooled data from all the 200 farm credit and non farm credit users were used to estimate an aggregate production function.

(3) The sum of squares of residuals from the credit users' regression equation is calculated as 0.01786

(4) Similarly, the sum of squares of error in respect of the non credit users' regression equation is calculated as 0.08446.

(5) The sum of squares of error in respect of the pooled sample (credit and non credit users) regression equation is calculated as 0.06727

Finally the F- ratio according to Chow (Koutsoyiannis 2001) is given as

$$F^* = \frac{(e^2_p - (e^2_c + e^2_n)/K}{(e^2_c + e^2_n)/(n_c + n_n - 2K)} \quad \text{..... (2)}$$

Where

n_c = number of observations in the credit users regression equation.

n_n = number of observations in the non credit users regression equation.

K = number of parameters being estimated.

e^2_p = Sum of squares of error from the pooled regression equation.

e^2_c and e^2_n = Error sum of squares from credit and non credit users regression equations.

(7) We reject Ho, if $F^* > F0.05, 5, 110$

Allocative Efficiency

Allocative efficiency denotes the ability of farm firms to equate the marginal value product of a factor to its unit price. Mathematically, a farm is allocatively efficient if

$MVPxi = Pxi$ or $MVPxi / Pxi = 1$ ……..……eqn. (3)

Where

MVPxi (i= 1, 2 …6) = marginal value product of the ith factor

Pxi (i= 1, 2 …6) = the unit price or marginal factor cost (MFC) of the ith factor.

In order to examine the allocative efficiencies of the two groups of farms, the production functions estimated were used. A comparison

of the allocative efficiency of any two groups of farms according to Onyenweaku (1994) requires that they are characterized by constant returns to scale the same of neutral production function and the same configuration of input and output prices.

As a means of comparing the allocative efficiencies of the two groups of farms, an index of allocative efficiency, W, is derived by

MVPxi /Pxi = Pyfi /Pxi = Wij ..... eqn. (4)

Where

MVPxi (i= 1, 2 …6) = the marginal value product of the ith input

Wij = allocative efficiency index for each farmer group,

Py = unit output price

Fi = dy / dx = marginal physical product of the ith input

i= the particular input, j represents the farm type (Credit and Non Credit) (other terms are as previously defined).

In this study the dependent variable; (the gross farm output) was measured in naira terms. Also the variable factors of production; except land and labour were measured in naira terms. Thus the marginal product (MP) is in monetary terms and the output price (P_y) becomes irrelevant (Onyenweaku et al. 1996; Anyanwu 1993, 2003, 2005; Ohajianya et al. 2004; Nwaru 2003). Accordingly the marginal value products will be directly equal to the allocative efficiency indices for all factors except land, and labour.The price of capital input will be taken as one naira plus the relevant interest charge (Anyanwu 1993, 2003, 2005).This is because the marginal value products are already deflated by the unit factor prices, since the values of the factors are the products of the quantity employed and the unit factor prices. Thus for X_3, X_4 and X_5 that are measured in naira terms

Wij = Pyfi = MVPxi ..... eqn. (5)

Variables remain as previously defined.

Optimal allocative efficiency for a particular group of farm is confirmed with respect to a given input if Wij = 1.

If Wij > 1, the resource is under utilized. Efficiency could therefore be increased by an increased use of that particular input. However if Wij < 1, the resource is over utilized hence a reduced use of that input is desirable to increase efficiency. On the other hand, one of the pair groups of farms is considered more allocatively efficient than its counterpart if the Wi for that group is nearer unity than the W_i for the other group in the pair. The two groups of farms achieves parity or equal allocative efficiency if

$Wi_1 = Wi_2$ ..... eqn. (6)

To show the extent to which a particular factor of production should be increased or withdrawn from current use to achieve the objective of profit maximization, the formular below was used;

$K_{ij} = (1- W_{ij})\ 100$ ..... eqn. (7)

Where K_{ij} is the required percentage change in allocative efficiency and Wij is as defined before.

If equation (7) is evaluated, a negative percentage implies that an increased employment of the factor is required. A positive percentage implies that a withdrawal of some of the factors from current use is required. If K_{ij} equals zero, then optimal allocative efficiency has been achieved.

RESULTS AND DISCUSSION

Non Farm Credit Users

Four functional forms were tried and the model that gave the best fit to the data was selected based on the sign and size of the coefficient of the estimated parameter and the magnitude of the coefficient of multiple determinations (R^2). Results of the estimated parameters for non credit users are presented in Table 1, figures in parentheses are t-ratios. In the linear model all the explanatory variables possess the expected positive signs. Farm size, labour input, and capital input are statistically significant at 5 percent. In the semi log model also, farm size and labour input are statistically significant at 5 percent. While farm size, labour input and capital inputs possess the expected positive sign, expenditure on planting materials is inversely related to gross farm output. In the double log model on the other hand, all the explanatory variables possess the expected positive sign, while farm size, labour input, and capital inputs are statistically significant at 5 percent, expenditure on planting materials are non significant at the chosen level of probability. While labour input and capital inputs possess the expected positive sign and are statistically significant at 5 percent, farm size and expenditure on planting materials are non significant in the exponential model. The coefficients of multiple determination (R^2) shows the variations in the gross income of the farmers accounted

Table 1: Production function statistics of non farm credit users

Variables	*Linear*	*Semi log*	*Double log*	*Exponential*
Constant term	657.07	-1(456735	4.234	5.264
	(0.013)	(-4.51)***	(15.22)***	(110.67)***
Farm size (Ha)	29888.72	167935.9	0.117	0.001253
	(2.187)**	(3.963)***	(3.218)***	(0.099)
Labour input (man-days)	6253.09	1021075	0.750	0.0056
	(7.991)***	(6.279)***	(5.355)***	(7.812)
Planting materials (N)	0.0105	-0.05	0.00000006	-0.00000008
	(0.060)	(-0.358)	(0.491)	(-0.523)
Capital input (N)	1.005	18921.6	0.02046	0.00000086
	(2.982)***	(1.831)	(2.298)**	(2.795)***
R2	0.953	0.965	0.951	0.924
F-ratio	481.306	1.597	460.240	289.969

** = Significant at 5% *** = Significant at 1% Figures in parenthesis are t-ratios
Source: Computed from survey data 2009.

for by the variations in the explanatory variables. The coefficient of multiple determinations for the linear, semi log, double log and exponential models are 0.953, 0.965, 0.951 and 0.924.respectively. The double log model is therefore chosen for further analysis of the results.

In the double log model, all the explanatory variables possess the expected positive sign. This implies that increase in farm size; labour input, planting materials and capital input will lead to increase in the gross farm income of Non Farm Credit Users in Rivers State. Furthermore, farm size, labour input and capital inputs are statistically significant at 5 percent, implying that these exogenous variables play significant roles in the determination of the gross farm income of Non Farm Credit Users in Rivers State. These results agree with Anyanwu, et al. (2010) in Rivers State, and Nwaru (2003), in Abia State, all in Nigeria. On the other hand, expenditure on planting materials is statistically non significant at the chosen level of probability. This confirms the lamentations of NDDC (2006), that fertilizers, agro-chemicals and improved seeds (planting materials) are neither readily available nor been widely adopted in Rivers State and Niger Delta in general. The non significance of planting materials may be as a result of the usage of unimproved planting materials, which further confirms the argument of Omanukwue (2007). The coefficient of multiple determinations (R^2) is 0.951 which implies that about 95.1 percent of the variations in the gross income of Non Farm Credit Users is accounted for by the explanatory variables included in the model, others are taken care of by factors not explicitly stated in the models such as topography and soil quality.

Farm Credit Users

The production function statistics for farm credit users are presented in Table 2, figures in parenthesis are t-ratios. In the linear and semi log models, farm size and labour input possess the expected positive signs and are statistically significant at 5 percent; while expenditure on planting materials is statistically significant and inversely related to gross farm income of the farmers. On the other hand, capital input is statistically non significant and inversely related to the gross farm income of the non credit users. In the double log model on the other hand, farm size, labour input and capital input possess the expected positive sign while expenditure on planting materials is inversely related to gross farm income and statistically significant at 5 percent. Farm size and labour input are also statistically significant at 5 percent level. While capital input is statistically non significant.

Results of the exponential model shows that farm size and labour input and expenditure on planting materials are statistically significant at 5 percent, while capital input is statistically non significant. The coefficients of multiple determinations for the linear, semi log, double log and exponential functions are 0.601, 0.612, 0.663 and 0.600 respectively.

Therefore, based on the sign and size of the coefficients of the estimated parameters and the magnitude of the coefficient of multiple determinations the double log model is chosen as the lead equation. In the double log model, farm size, labour input and capital input are positively related to the gross farm income of the credit users. This implies that increase in farm size,

Table 2: Production function statistics for credit users

Variables	*Linear*	*Semi log*	*Double log*	*Exponential*
Constant term	73645.24	535866.3	6.040	5.103
	(2.28)***	(1.62)	(12.26)***	(98.10)***
Farm size (Ha)	72183.29	275145.9	0.475	0.119
	(7.192)**	(7.65)***	(8.86)***	(7.415)***
Labour input (man days)	4851.591	409838.2	0.653	0.00764
	(5.447)***	(5.58)***	(5.96)***	(5.356)***
Planting materials (N)	-1.897	-0.198351	-0.389	-0.0000037
	(-2.117)**	(-2.297)**	(-3.02)***	(-2.552)**
Capital input (N)	-0.536	-4782.610	0.02658	0.00000259
	(-0.110)	(-0.116)	(0.432)	(0.333)
R2	0.601	0.596	0.663	0.600
F-ratio	35.765	37.453	46.682	35.563

** = significant at 5% *** = significant at 1% Figures in parenthesis are t-ratios.
Source: Computed from survey data, 2009.

labour input, and capital input will lead to increase in the gross farm income of credit users in Rivers State. The statistically significant determinants of gross income of credit users are farm size, labour input and expenditure on planting materials. These variables are statistically significant at 5 percent. While an increase in farm size, and labour input will lead to increase in the gross farm income of the credit users, a reduction in the current level of use of planting materials will increase the gross farm income of this category of farmers in Rivers State, all things being equal. This use of unimproved planting materials which NDDC (2006) pointed out to be a characteristic feature of agriculture in Rivers State and Niger Delta has once more manifested among credit users. This shows that credit availability alone cannot guarantee increased farm productivity if the improved planting materials are scarce or beyond the reach of the average smallholder farmers. It is, therefore, not surprising that Omanukwue (2007) argued that restricted access to finance, dearth of agricultural inputs, inefficient market systems and continued use of traditional agricultural techniques are among the factors responsible for low agricultural growth and development. The coefficient of multiple determinations is 0.663, which implies that about 66.3 percent of the variations in the gross farm income of credit users are accounted for by the variations in the explanatory variables included in the model.

Relative Technical Efficiency of Credit and Non Credit Users

To determine the relative technical efficiency of the credit and non credit user farmers, the Chow (1960) analysis of covariance technique was used (Table 3), following Onyenweaku et al. (1996); Anyanwu (1993) and Anyanwu et al. (2006). If the production function is stable across the two types of farms as given by the slope or behavioural coefficients in the form of elasticity measure then technical efficiency is statistically the same. In other words, presence of structural changes is suggestive of a significant difference in the estimated parameters of the production functions of the two farm types and we thus reject the null hypothesis that credit and non credit users are equally technically efficient. However, absence of structural changes indicates that the estimated parameters of the production functions of the two farm types are identical, denoting equality in the level of technical efficiency among the credit and non credit user smallholder farmers.

Table 3: Production Function Statistics of farm credit, non farm credit users and pooled data.

Variables	*Farm credit users*	*Non farm credit users*	*Pooled data*
Constant term	6.040	4.234	5.315
	(12.26)***	(15.22)***	(21.277)***
Farm size (Ha)	0.475	0.117	0.322
	(8.86)***	(3.218)***	(9.248)***
Labour input	0.653	0.750	0.821
(man days)	(5.96)***	(5.355)***	(30.310)***
Planting	-0.389	0.00000006	-0.277
materials (N)	(-3.02)***	(0.491)	(-5.711)***
Capital	0.02658	0.02046	0.01986
input (N)	(0.432)	(2.298)**	(0.759)
R2	0.663	0.951	0.891
F-ratio	46.682	460.240	398.188

** = significant at 5% *** = significant at 1%
Figures in parenthesis are t-ratios.
Source: Computed from survey data, 2009.

The Chow (1960) F-ratio is given by

$$F^* = \frac{(\Sigma e2p - (\Sigma e2c + e2n)K}{(\Sigma e2c + \Sigma e2n) / nc + nn - 2k}$$

Where p = pooled
K = total number of b's
nc = credit users
nn = non credit users.
$e^2p = 0.06727$
$e^2c = 0.01786$
$e^2n = 0.08446$
K = 5
nc = nn = 100

$$F^* = \frac{0.06727 - 0.10232/5}{0.10232/190} = \frac{0.0070}{0.0005385}$$

= 0.0070 / 0.0005385 = 12.999
F0.05, V1 = 5, V2 = 190 = 4.17

Since F* = 12.999 > F0.05, = 4.17 we reject the null hypothesis that there is no significant difference in the technical efficiencies of credit and non credit users in the study area. In other words farm credit users in Rivers State achieved higher level of technical efficiency relative to their non credit user counterparts. Traditional theory of production stipulates that the more efficient farm will have a larger constant term than the less efficient one (Koutsoyiannis 1979), leading us to conclude in this study that Farm Credit Users are more technically efficient than the Non Farm Credit Users in Rivers State. This conclusion agrees with Omanukwue (2007) and NDDC (2006) in Nigeria.

The constant term, 6.040, in the production function of Farm Credit Users is higher than that (4.234) of the Non Farm Credit Users. This result agrees with Nwaru (2003) in Abia State of Nigeria, Desai et al. (1993) in India. However, this result disagrees with Obasi (1995) in Owerri, Nigeria that non credit users were technically more efficient than credit users.

Allocative Efficiency of Farm Credit and Non Farm Credit Users

The ratio of marginal value product to marginal factor costs (MFC) for Farm Credit Users and Non Farm Credit Users are presented in Table 4. Using the Cobb-Douglass production function as the lead equation for Farm credit and Non Farm Credit Users, the allocative efficiency indices for land, labour, are derived (Ohajianya et-al. 2004) as

$Wij = bi(Q_{ij} / X_{ij}) / P_{xi}$

Where Q_{ij} = Geometric mean of output (N) in $_j$th farm
X_{ij} = Geometric mean of ith input in $_j$th farm
Others are as previously defined.

Table 4 shows the ratio of marginal value product of resources to their marginal factor costs. The Table reveals that resources such as farm land, labour, and capital inputs are underutilized, while expenditure on planting materials were over utilized among the Farm Credit Users in Rivers State. This result is to be expected, as excessive use of unimproved planting materials would only reduce the gross income of the small holder farmers. Thus the level of parity between marginal value product of each resource and the marginal factor cost has not been reached in the production system among Farm Credit Users.

Table 4: Production Elasticities and Allocative efficiency indices for farm credit and non farm credit users in Rivers State

	Farm credit users	*Non farm credit users*
Farm land	0.475	0.117
Labour	0.653	0.750
Planting materials	-0.389	0.00000006
Capital input	0.02658	0.02046
Geometric Mean of Inputs and Outputs		
Farm land	1.1011	1.6829
Labour	84.7850	34.8744
Planting materials	13432.32	45001
Capital inputs	5377.0	4481.0
Farm output	569280	276550
Marginal Value Product		
Farm land	245579.87	19226.54
Labour	4384.5	5947.41
Planting materials	-16.49	115200333
Capital inputs	2.81	1.26
Marginal Factor Cost		
Farm land	2470	2500
Labour input	1510.5	1718.75
Expenditure on planting materials	1	1
Interest rate	1.19	1.19
Allocative Efficiency indices		
Farm land	99.42	7.69
Labour	2.90	3.46
Expenditure on planting materials	-16.49	n.s
Capital input	2.81	1.26
Percentage Changes in Allocative Efficiency Indices		
Farm land	-9842	-669
Labour	-190	-246
Expenditure on planting materials	-1700	-
Capital input	-181	26

n.s. = not significant.
Source: Survey data 2009.

The Farm Credit Users were relatively more allocatively efficient in the use of capital input,

than any of land, labour, and planting materials. Similarly, among the Non Farm Credit Users, Table 4 shows that resources such as land, labour and capital are under utilized among Non Credit Users. The Non Farm Credit Users were relatively, more allocatively efficient in the use of capital than any of land and labour. Table 4 reveals further that none of the defined farmer groups achieved absolute allocative efficiency in the use of any farm resource. They are inefficient in the allocation of farm production resources such as farm land, labour input, planting materials and capital input. On the whole, Farm Credit Users achieved higher allocative efficiency in the use of labour (2.90) than the Non Farm Credit Users (3.46), probably because they were able to utilize their credit in hiring the requisite trained manpower. Non Farm Credit Users on the other hand achieved higher allocative efficiency (7.69) and (1.26) in the use of land and capital inputs than Farm Credit Users.

CONCLUSION

This study examined production efficiency among farm credit and non farm credit users in Rivers State. Cross – sectional data generated from 200 smallholder farmers collected from ten LGAs were used. Production function analysis and analysis of covariance was used in analyzing the data. Among the Farm Credit Users, results of data analysis showed that farm land, labour input and expenditure on planting materials were the significant determinants of gross income, while capital input was statistically non significant at 5% level of probability. On the other hand, among the Non Farm Credit Users, results showed that farm land, labour input, and capital inputs are statistically significant at 5% level and as such are the main determinants of their gross income. Expenditure on planting materials, on the other hand was not statistically significant at 5% level among Non Farm Credit Users. This could be due to the use of unimproved planting materials probably occasioned by non usage of available credit facilities that characterized the smallholder farming systems in the Niger Delta.

Furthermore, results of data analysis showed that Farm Credit Users were more technically efficient than their Non Farm Credit User counterparts. In addition, the results showed that none of the farmer groups achieved absolute allocative efficiency in the use of any resource inputs. While Farm Credit Users were relatively more allocatively efficient in the use of labour, Non Farm Credit Users were relatively more allocatively efficient in the use of land and capital inputs. The existence of resource use disequilibria among the two farmer groups is indicative of the possibility of increasing output at the current level of technology in Rivers State, Nigeria.

RECOMMENDATIONS

Appropriate policies should be put in place by the government to make more lands available to the smallholder farmers to increase their productivity. This could be achieved through the amendment of the existing land laws. To enable the farmers have easy access to hired labour and improved planting materials, credit facilities should be skewed in their favour. Extension agents should also be mobilized to carry out public enlightenment on the need for the Non credit users to appreciate the benefits of credit in the smallholder farming systems. Appropriate extension programmes should also be put in place to educate farmers on the new innovations in farming especially the need to adopt improved planting materials.

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