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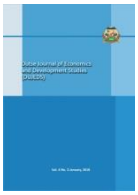

IMPACT OF MICRO-CREDIT UTILIZATION ON PROFITABILITY AND PRODUCTIVITY EFFICIENCY OF MAIZE FARMERS IN KADUNA STATE, NIGERIA

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Abstract
Studies have shown that people living in poverty devise mitigation measures to overcome their economic vulnerability. This study addresses the following research questions. What are the socio-economic characteristics of the beneficiaries and non-beneficiaries of micro-credits in the study area?. Are farm enterprises in term of productivity efficiency of beneficiaries of microcredit better than those of non-beneficiaries? In addition, are farm enterprises in term of profitability of beneficiaries of microcredit better than those of non-beneficiaries? Data were collected, with the use of well-structured questionnaire, from 336 small-scale maize farmers in Kaduna state of Nigeria, categorized into beneficiary and non-beneficiary of micro-credit through multi-stage sampling procedure. Descriptive statistics, profit and the Stochastic Frontier Production Function (SPFF) models were used to analyze the data. The results show that three variables seed, pesticide and fertilizer were statistically significant at 1% for microcredit beneficiaries and variables seed and labour were statistically significant for non-beneficiaries. The result gives a mean technical efficiency of 0.93 and 0.89 for the beneficiaries and non-beneficiaries. The results revealed that profits per hectare of beneficiaries farmers is higher (N103,990) than that of non-beneficiaries farmers (N74,887), suggesting that, access to credit could lead to improved farmers' productivity and higher income in form of revenue and profit. It is thus concluded that credit could bring about higher productivity and profit in agricultural production, hence, this study recommends that bank of agriculture and other relevant financial institutions should be encouraged to have more rural outlets, while there should be federal government policy of empowering rural farmers to have access to more agricultural credit.

Keywords: Maize, Farmers, Micro-credit, Output, Agriculture, Finance, Policy

Introduction

Studies have shown that people living in poverty devise mitigation measures to overcome their economic vulnerability (Oladmeji *et al.*, 2015). Microcredit is one such measure to reduce the burden of poverty among households in many of the developing countries of the world, including Nigeria. Microcredit means easily repayable small loans that low-income earners get informally from friends, relatives and people in the same network and from formal credit lending institutions like banks and microfinance institutions. According to Ouma and Ogaga, (2015) and Sulemana and Adjei (2015) microcredit facilities include micro-credit loans, inputs, micro-savings, micro-insurance, and money transfers been attributed with enabling micro-entrepreneurs to build businesses and increase their income, as well as improving the general economic wellbeing of the poor.

The inability of formal financial institutions and poor growth of private sector microfinance in

Nigeria led to the growth of government sponsored development financial schemes such as anchor borrower, small and medium scale enterprise loan, money market, traders' money, through the bank of industry in Nigeria. Although the federal government of Nigeria adopted microfinance as the main source of poverty reduction and mandated the Central Bank of Nigeria (CBN) to develop appropriate policy and framework for the operations of MFIs. Despite this, however, the number of beneficiaries of microfinance banks is an insignificance proportion of the people in need of microfinance services.

According to Wali (2009), microcredit has insufficiently penetrated the poor strata of society who comprise of the marginalized and deprived category of people living below the poverty line. About 90% of the poor people in developing countries do not have access to financial services for either credit or savings (Mohammed, 2008). Microfinance is entering into a new and more dynamic phase. The launching of initial public offerings, innovations in mobile microfinance services, remittance through microfinance institutions using latest communications technology are the new dimension of microfinance that bring finance and hope to the world's least developed countries (Naveen *et al.*, 2012). These expand their capacity to access funds, which may increase productivity, domestic savings and the ability of households to engage in businesses that would improve their household income.

Maize is widely grown across Nigeria including Kaduna State. Majority of maize farmers are characterized by low productivity, low income, low level of formal education, low savings and investment, inadequate credit facilities, inefficient use of abundant resources and continued use of crude implements (Panwal *et al.,* 2006; Oladimeji and Ajao, 2014). With very low level of income, it is difficult for small-scale maize farmers to accumulate capital for meeting their production expenditure and as such, a large number of them in rural Nigeria are dependent on credit (Hadiza, 2005). For accumulation of capital for various productive activities as well as for sustaining livelihood, the poor maize farmers seek credit provided by institutional and non-institutional sources.

Ashaolu *et al.* (2011) and Mohummed and Lu (2013) reported that there are significant relationships between productivity growth and both poverty and nutrition, and that agriculture had a greater impact on poverty than the other sectors. Access to institutional credit by farmers and appropriate quantity and quality of agricultural credit are crucial for realizing the full potential of agriculture as a profitable activity. In spite of government's efforts aimed at improving household incomes for the rural farmers through microcredit programmes, many households still have low income. This may be attributed to borrowers' characteristics, business type and continued inaccessibility to microcredit. The question would then be the extent to which microcredit has been utilized and whether or not it has empowered the beneficiaries. The inability to procure inputs in agricultural production may arise due to credit-constrained and this may lead to lower profit than those farmers that have access to microcredit.

Unfortunately, many studies stressed the impact of microcredit on output and household food security ignoring the profitability and productivity aspects, which affect farmers' income. Consequently, this study is set out to analyze the impact of microcredit utilization on profitability and productive efficiency of maize farmers in the study area and to address the following research questions:

i. What are the socio-economic characteristics of the beneficiaries and non-beneficiaries of micro-credits in the study area?
ii. Are farm enterprises in term of productivity efficiency of beneficiaries of microcredit better than those of non-beneficiaries?
iii. Are farm enterprises in term of profitability of beneficiaries of microcredit better than those of non-beneficiaries?

Materials and Methods

Study Area

The study was conducted in Kaduna State, North-West zone of Nigeria and has 23 Local Government Areas (LGAs) with Kaduna as its capital. The State lies between Latitudes 11° 32‟ and 09° 02‟ N and longitudes 08° 50‟ and 06° 15‟ E (Kaduna state government, 2012) and shares common borders with Zamfara, Katsina and Kano States to the North, Niger State to the West, Bauchi and Plateau States to the East and the Federal Capital Territory, Abuja and Nassarawa State to the South. It occupies an area of approximately 48,473.3 km^2 and a projected population of 8,853,101 persons in 2018 at a growth rate of 3.2 percent per annum based on National Population Census (NPC) of 2006. The entire land structure consist of an undulating plateau with major rivers in the State including Rivers Kaduna, Kagom, Gurara and Gaima. The state experiences a tropical continental climate with two distinct seasonal climates, dry and rainy seasons. The wet season is usually from May to October and dry season often November to April. The mean annual rainfall ranged from 1,016 mm to 1,524 mm and the

average annual temperature is 25.2 °C (Omotosho *et al.*, 2013).

Data Collection and Sample Size

Primary data were collected with structured questionnaires administered on both beneficiaries and non-beneficiaries of microcredit with the help of trained enumerators under the supervision of the researcher. A multi-stage sampling procedure was employed to select the appropriate sample size of beneficiaries and non-beneficiaries of microcredit in the study area. The first stage was the stratification of the study area into four (4) zones in line with the KADP subdivision of the State and these are Maigana, Samaru Kataf, Birnin Gwari and Lere zones (KADP, 2012). The second stage was the purposive selection of one LGA within each of the four operational zonal offices of the KADP in the State. This selection was based on the number/predominance of both formal and informal microcredit institutions that grant agricultural credit to individuals and/or households in the LGAs. Based on a reconnaissance survey, Zango-Kataf, Chikun, Lere and Giwa LGAs were selected for the purpose of the study. The third stage involved the random selection of one microfinance bank (MFB) from each of the LGAs selected for the study. The selected microfinance banks and their corresponding LGAs as well as sampling frame for beneficiaries were depicting in Table 1. It is pertinent to note that these four MFBs had strong interest towards lending of agricultural credit to small-scale farmers.

Table 1: Distribution of Agricultural Credit Beneficiaries by selected MFBs in the State

Local Govt. Area	Microfinance Bank	Beneficiaries
Chikun	SabonYelwa MFB	423
Giwa	Giwa MFB	457
Lere	Balera MFB	406
Zango-Kataf	AtyapMFB	390
Total		1,676

Source: Reconnaissance Survey (2015)

Thereafter, 10 percent of the sampling frame 168 beneficiaries were randomly selected from the 4 microfinance banks as respondents. Similarly, 168 non-beneficiaries of micro-credit were also randomly selected from a list of households obtained from the respective Zonal KADP resulting in a total number of 336 respondents for the entire study as illustrated in Table 2.

Table 2: Sampling size of respondents

Local Government Area	Beneficiaries	Non-beneficiaries
Chikun	42	42
Giwa	46	46
Lere	41	41
Zango-Kataf	39	39
Total	168	168

Source: Reconnaissance Survey (2015)

Analytical Techniques

Descriptive statistics, gross margin and stochastic frontier production function (SFPF) models were used to analyze the data to achieve the objectives of the study.

The Stochastic Frontier Production Function (SPFF) technique was used to analyze productivity efficiency of beneficiaries and non-beneficiaries of microcredit. The SFPF model was specified by the Cobb-Douglas frontier production function which is defined by:

$$lnY_i = \beta_0 + \beta_1 lnX_1 + \beta_2 lnX_2 + \beta_3 lnX_3 + \beta_4 lnX_4 + \beta_5 lnX_5 + V_i - U_i \quad (1)$$

Where, the subscript *i* indicates the ith farmer in the sample; Y_i = Maize output of farmers in kilogramme (Kg); β_0= constant term or intercept; β_i= unknown parameters to be estimated; X_1= quantity of Maize seed in Kg; X_2= farm size in hectares (ha); X_3= total labour in man-days; X_4= pesticides in litres; X_5= fertilizers in Kg; V_i= random errors; and U_i= technical inefficiency effects predicted by the model (Coelli, 1995).

The technical inefficiency effects predicted by the model, U_i, is affected by the socio-economic characteristics of the respondents and is defined as:

$$U_i = \alpha_0 + \alpha_1 Z_1 + \alpha_2 Z_2 + \alpha_3 Z_3 + \alpha_4 Z_4 + \alpha_5 Z_5 \quad (2)$$

Where, α_0= constant term or intercept; α_i= unknown parameters to be estimated; Z_1= the age of the *ith* respondent in years; Z_2= years of farming experience of the *ith* respondent in years; Z_3= is a dummy variable for level of education of respondents which has value of 0 for no formal educational attainment, 1 for those with Arabic and/or Adult education, 2 for those with primary school education, and 3 and 4 for those with secondary as well as those with tertiary education respectively; Z_4= household size of respondents; Z_5= is a dummy variable for sex of the *ith* respondent with 1 for male and 2 for female. These were included in the model to indicate their possible influence on the technical efficiencies of the farmers.

Gross margin analysis estimated the profitability of maize production activities of both beneficiaries and non-beneficiaries of microcredit in the study area. That is,

$$GM = GR - TVC \quad (3)$$

$$RPN = {}^{GM}/_{TVC} \quad (4)$$

Results and Discussion

Table 3 shows summary statistics of socio-economic variables used in determining maximum likelihood estimates of the stochastic frontier production function of maize farmers that benefitted from micro-credit compared to non-beneficiaries in Kaduna state, Nigeria.

Table 3: Socio-economic characteristics of respondents

Variable	Beneficiaries			Non-beneficiaries			Pooled		
	Mean	Min.	Max.	Mean	Min.	Max.	Mean	Min.	Max.
		Quantitative			socio-economic			characteristics	
Age	42	29.00	62	40.00	24	59	41.00	24	62
	Stdev.	7.38		8.11			7.84		
Household size	12	2.00	22	9.00	2	25	10.00	2	23
	Stdev	5.44		4.89			5.35		
Experience	13.05	5.00	45	23.00	3	43	24.00	3	43
	Stdev	13.05		11.1			10.08		
		Qualitative			socio-economic			characteristics	
		F	%	F	%		F	%	
Sex	Male	137	82	150	89		287	85	
	Female	31	18	18	11		49	15	
Marital status	Married	135	80	133	79		268	80	
	Single	29	17	31	18		60	18	
	Divorced	2	1	2	1		4	1	
	Widowed	2	1	2	1		4	1	
Educational level	Adult	20	12	54	32		74	22	
	Primary	38	23	60	36		98	29	
	Secondary	70	42	21	13		91	27	

Source: Reconnaissance Survey (2015)

Productivity Efficiency Analysis

The maximum likelihood (ML) method using Frontier 4.1 software developed by Coelli (1995) is presented in Table 4. The sigma squared for the beneficiaries was (0.409) and for the non-beneficiaries of micro-credit (0.525) which were both significantly different from zero at 1% level of probability. This indicates good fit and correctness of the specified assumption of the composite error term. Observed significance of sigma (δ) for both beneficiaries and non-beneficiaries were statistically significant at 1% level of probability. These showed that there were some measurable inefficiency in maize production by both beneficiaries and non-beneficiaries of micro-credit.

The value of 0.418 of the gamma for the beneficiaries and 0.796 for the non-beneficiaries

farmers were both statistically significant at 1%. This means that 42% of the total variation in output of the beneficiary farmers and 80% of the total variation for the non-beneficiary farmers were as a result of factors within the control of the farmers. Therefore, variation in maize output could be attributed to technical inefficiency. This might also be interpreted to mean that the differences between actual and frontier output had been dominated by technical inefficiency within the control of the farmers.

The results show that three variables; seed, pesticide and fertilizer were statistically significant at 1% for microcredit beneficiaries and variables seed and labour were statistically significant variables for non-beneficiaries. The estimated coefficient for seed 0.950 for beneficiary and 0.678 for non-beneficiary were positive and statistically significant at 1% level. This implies that increasing seed by 1% will increase maize output of the beneficiary and non-beneficiaries by 0.950 and 0.678 units and the output is inelastic to changes in the quantity of seed used. The significance of seed quantity is however, due to the fact that seed determines to a large extent the output obtained. If correct seed rates and quality seeds are not used, output will be low even if other inputs are in abundance. This is in line with the findings of 69 Sani and Oladimeji, (2017) who observed that the estimated coefficient of seed and labour inputs were positive as expected and statistically significant at different level of probability.

The coefficient of agrochemical (0.672) was positive and significant at 1% for beneficiary. This implies that an increase in agrochemical by 1% will increase maize output of the beneficiary by 0.672 units which means, all things being equal the output is inelastic to changes in the quantity of agrochemical used contrary to findings of Sani and Oladimeji, (2017). In addition, the coefficients of fertilizer (-0.089) and labour (0.067) were related to the output of the beneficiary and non-beneficiaries respectively at 1% probability level. This implies that a unit increase in the quantity of fertilizer will decrease the output of the farmers by 0.067 and this may be attributed to over utilization or misapplication of these resources. The results are comparable to the findings of Oladimeji and Abdulsalam, (2013).

Table 4: Maximum likelihood estimates of the stochastic frontier production function

Variable	Beneficiaries			Non-beneficiaries		
	β_i	SE	t-value	β_i	SE	t-value
Constant	1.136	0.407	2.79	2.140	0.413	5.18
Seed	0.950***	0.071	13.38	0.678***	0.075	9.04
Farm size	-0.053	0.071	0.75	0.019	0.069	0.28
Labour	-0.008	0.044	0.18	0.067***	0.016	4.19
Pesticide	0.672***	0.154	4.36	0.002	0.002	1.00
Fertilizer	-0.089***	0.021	4.24	-0.039	0.038	1.03
Sigma square (δ^2)	0.409***	0.130	3.14	0.525***	0.12	4.38
Gamma (γ)	0.418***	0.140	2.98	0.796***	0.25	3.18
LLF	-77.231			-43.084		
LR test	24.987			84.950		
Mean	0.87			0.49		

Source: Reconnaissance Survey (2015)
Note: ***P<0.01 level of probability. LLF denote log likelihood function

Farm Specific Technical Efficiency Level

The estimation of technical efficiency for individual farmer in Figure 1 revealed that more than 89% of beneficiaries of micro-credit had technical efficiency of over 80 % while the remaining 11% have their technical efficiency falling below or equal to 0.80. The result gives a mean technical efficiency of 0.93 that implies that the beneficiaries have potential to increase their output by 7%. On the other hand, 82% of the non-beneficiaries have their technical efficiency above 0.80 while 18% has their technical efficiency below or equal to 0.80. The result gives a mean technical efficiency of 0.89 implying the non-beneficiaries have potential to increase their technical efficiency level by 11%. This finding agrees with the finding of Ezeh (2004) who reported that Fadama crop farmers in Abia State, Nigeria were more technically efficient than their non-Fadama crop counterpart.

Table 5: Farm specific technical efficiency level

Efficiency level	Beneficiaries		Non-beneficiaries	
	Frequency	Percentage	Frequency	Percentage
≤0.80	19	11	30	18
0.81-0.85	20	12	29	17
0.86-0.90	44	26	96	57
0.91-0.95	85	51	13	8
0.96-1.00	0	0	0	0
Total	168	100	168	100
Minimum	**0.68**		**0.36**	
Maximum	**1.00**		**0.97**	
Mean	**0.93**		**0.89**	

Source: Reconnaissance Survey (2015)

Maximum likelihood estimates of the inefficiency model

Table 5 present maximum likelihood estimates of the parameters of inefficiency model. The variance parameters for sigma- square (δ^2) and gamma (γ) are estimated at 0.24 and 0.46 and were statistically significant at 1% in each case for the beneficiaries. Within the non-beneficiaries, the sigma-square (δ^2) and gamma (γ) are estimated at 0.18, which is statistically significant at 1% and 0.03 for gamma was not significant. The sigma-square attests to the goodness of fit and correctness of the distributional form assumed for the composite error term while the gamma indicates the systematic influences that are unexplained by the production function and the dominant sources of random errors. This implies that about 46% and 3% of the variation in output of the beneficiaries and non- beneficiaries is due to the differences in their technical inefficiency.

For the associated inefficiency effects, it was found that the coefficients of all the variables: age, experience, education, household size and sex were significant for beneficiaries of micro-credit, all the variables record negative signs except educational status. For non-beneficiaries of micro-credit, only one variable, sex was significant.

Within the beneficiaries of micro-credit, it was found that the coefficient of age was -0.031, which is significant at 10% level of probability. The negative coefficient of age implies that the older a farmer is, the lower will be the level of technical inefficiency or the higher will be his technical efficiency in maize production.

The coefficient of farming experience was -0.031, which is statistically significant at 5% level of probability. This finding is consistent with that of Sani and Oladimeji, (2018) whose result shows a negative relationship between farming experience and technical efficiency in sorghum production in Gombe state Nigeria. In contrast, the coefficient of education was found to be positive and statistically significant at 10% level of probability. This implies education increases the farmer's technical inefficiency and reduces his technical efficiency. This result concur with that of Oladimeji and Abdulsalam, (2013) that showed a positive relationship between education and technical efficiency in rice production in Kwara state, Nigeria.

The coefficient of household was negative and statistically significant at 5% level of probability. This implies that as household size increases, the technical inefficiency decreases thereby increasing technical efficiency of farmers. This could be due to the fact that large household size makes sufficient availability of labour for farm production. This finding disagrees with the findings of Mohammed Lawal *et al*. (2009) who reported that as household size increases the technical efficiency.

Table 6: Maximum likelihood estimates of the inefficiency model

Inefficiency Variable	Beneficiaries			Non-beneficiaries		
	Coefficient	SE	t-value	Coefficient	SE	t-value
Constant	2.328	0.936	2.49	-0.425	0.669	0.64
Age	-0.031*	0.016	1.94	-0.007	0.010	0.7
Experience	-0.031**	0.014	2.21	0.001	0.002	0.5
Education	0.114*	0.058	1.97	0.087	0.095	0.92
Household size	-0.078**	0.035	2.23	0.015	0.013	1.15
Sex	-0.658**	0.277	2.38	0.400*	0.223	1.79
$Sigma^2$	0.237***	0.035	6.77	0.175***	0.017	10.29
Gamma	0.457***	0.127	3.60	0.029	0.028	1.04
LLF	-73.290			-85.366		
LR test	14.279			12.442		

Source: Reconnaissance Survey (2015)
Note: *** P<0.01, **P<0.05 and * P<0.10 levels of probability.

Summary statistic of inputs and output in maize production

Table 6 depicts the summary statistic of inputs and output in maize production. A total of 942.5 and 666.6 hectares of land were put into maize production by beneficiaries and non-beneficiaries of micro-credit giving an average of 5.6 and 4.0 hectares of land per farmer. Most of the farmers utilized hybrid seeds. An average of 46 kg and 41 kg of seed per hectare was utilized by beneficiaries and non-beneficiaries of micro-credit. The average quantity of seed used was above the recommended rate of 17-20 kg per hectare (KADP, 2001). The average quantity of fertilizer used per hectare was 493 kg (9.8 bags) and 452 kg (9.1 bags) by both beneficiaries and non-beneficiaries. This is within the recommended quantity of 400 kg-500 kg (8-10 bags) per hectare depending on the level of Nitrogen content in the soil (KADP, 2001). Average quantity of pesticides used 6 litres and 5 litres by beneficiaries and non-beneficiaries of micro-credit respectively.

The total yield of maize for the sampled farmers was 394.5 tons and 342.1 tons by beneficiaries and non-beneficiaries of micro-credit and this translate to 2.4 tons and 2.0 tons per hectare. This is within the average yield of 2 tons/ha recorded in the state for the year 2001 (KADP, 2001). This result is, however not surprising since these inputs used (seed and fertilizer) were well utilized with the realization of 2.3 and 2.0 tons/ha, this is within the recommended yield of 2 tons/ha.

Table 7: Summary statistics of inputs and output in maize production

Input	Beneficiaries				Non-beneficiaries				
	Max.	Min.	Average	Std.dev.	Max	Min	Average	Std.dev.	Z-value
Land	10	1.5	6	2.3	13	1.5	4	2.1	6.813***
Seed	85	10	46	17.1	100	10	41	22.3	1.983*
Labour	656	28	204	119.9	1454	23	289	239.3	1.127
Fertilizer	3900	100	493	491.2	1150	100	452	277.9	1.653
Pesticide	15	2	6	2.7	15	0	5	2.5	2.238**
Output	11739.1	200	2348	1846.6	9666.7	307.7	2037	1453.4	1.72*

Source: Reconnaissance Survey (2015)
Note: ***P<0.01, **P< 0.05 and *P<0.10 levels of probability While NS=Not Significant

Profitability of maize farmers' beneficiaries and non-beneficiaries of micro-credit

The profitability analysis of maize production enterprise of beneficiaries and non- beneficiaries of micro-credit are presented on Table 7. The average price of ₦ 77.5/kg was computed and used to determine return. A gross returns of 2.4 tons/ha and 2.0 tons/ha on the average which is ₦181, 994 and ₦ 157,832 was realized by the beneficiaries and non- beneficiaries of micro-credit, respectively.

The total amounts invested in maize production by both beneficiaries and non-beneficiaries were ₦78, 004/ha and ₦82, 945/ha respectively, while the total revenue realized was ₦181, 994/ha and ₦157, 832/ha respectively. The average rate of return was found to be ₦ 1.33 and ₦ 0.90. This implies that for every one naira invested in the maize production a profit of 33 kobo was made by the beneficiaries while 90 kobo was realized by the non-beneficiaries, which is 10 kobo less than one naira for the non-beneficiaries to have a break even in maize production enterprise. The beneficiaries of micro-credit made additional profit of 33 kobo

compared to their non-beneficiaries counterparts who incurred 10 kobo lost. This could be attributed to the beneficiaries' access to credit to purchase inputs such as fertilizers and pesticides for maize production. This is confirmed that the beneficiaries' utilization of inputs such as fertilizer and pesticides were significantly differences from that of the non-beneficiaries at 10% and 1% levels of probability respectively. The result is comparable to finding of Ashaolu *et al.* (2011).

Table 8: Gross Margin per Hectare of Maize Production

		Beneficiaries		Non-beneficiaries		
Items	Unit Price	Average	Total Value	Average	Total Value	Z-value
1. Gross returns	(₦/kg)	Quantity	(₦/Ha)	quantity	(₦/Ha)	
Average yield	78	2348	181994	2037	157832	
2. Variable costs						
Seed	80	46	3669	41	3317	
Fertilizer	90	493	44413	452	40669	
Labour	120	20S4	24495	289	34631	
Pesticide	900	6	5427	5	4329	
TVC			78,004		82,945	
Gross Margin			103,990		74,887	
Return per naira			1.33		0.90	
t-value						4.697***

***P<0.10 level of probability
Source: Reconnaissance Survey (2015)

Test of Hypothesis

It was found that there is statistically significant difference between beneficiaries and non-beneficiaries of microcredit with respect to inputs such as land, seed and pesticide (Table 6). Also from the result which indicate profitability of beneficiaries, is significantly difference from the profitability of the non-beneficiaries at 1% level of probability (Table 6). Therefore, the null hypothesis is rejected. There is significant difference between the input utilization or the profitability of beneficiaries and non-beneficiaries of micro-credit.

Conclusion and Recommendations

The study revealed that, access to credit led to higher productivity and profit in maize production. It was also concluded that the beneficiaries were more technically efficient than the non-beneficiaries were. However, both respondents did not attain their maximum technical efficiency hence there is room for improvement in their level of technical efficiency in maize production. It is thus concluded that credit could bring about higher productivity and profit in agricultural production in the study area.

Hence, this study recommends that the Bank of Agriculture and other relevant financial institutions should be encouraged to have more rural outlets, while there should be federal government policy of empowering rural farmers to have access to more agricultural credit. The study also recommends that in order for the farm profits to be improved and agricultural productivity be enhanced, the agricultural finance should be improved; particularly what bureaucracy the farmers go through. This could be possible through establishment of micro-finance that is agricultural based in the rural areas to ease assessment. Finally, policy that will address both incessant inputs price increase and timely availability of these inputs should be formulated, while recapitalization policy of the federal government extended to micro-finance banks of recent is a welcome development. Such policy thrust needs to be extended to encourage existing banks, both commercial and micro-finance to have more rural outlets with well-designed prudent loan utilization training to go along with loan disbursement.

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