

THE ROLE OF AGRICULTURAL CREDIT IN ENHANCING SMALL-SCALE RICE FARMING IN SOUTHERN TARABA, NIGERIA

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Abstract

This study determined the effect of agricultural credit on small scale rice farmers in Southern Taraba State, Nigeria. The specific objectives of the study were to describe the socio – economic characteristics of small-scale rice farmers in the study area, identify the credit sources available in the study area, determine the influence of agricultural credit among small-scale rice producers and to identify constraints faced by small-scale rice farmers with regard to credit in the study area. Data were collected from a sample of 139 rice farmers selected through multi-stage sampling procedure using questionnaire and analyzed using simple descriptive statistics and regression analysis. Results revealed that 76% of the respondents were male, 67% were married. The mean household size, farm size and age were 50%, 37% and 30% respectively. Most (81%) of the respondents had one form of formal education or another and family land (48%) was the dominant. Informal credit sources were the majority (75%). The results also indicated thrift and credit (25%) and friends/relatives were the dominated sources of credit among the small-scale farmers. The regression analysis results indicated that farm size, fertilizer, quality of seed, amount of loan and marital status were positive and statistically significant at 5% level of significance, while family labour was positive and statistically significant at 1% level of significance. This implies that increase in these variables lead to increase in the output of rice production all things being equal. The coefficient of determination R^2 was 0.77 which implies that 77% of the variations in the rice output were explained by the explanatory variables. This indicates that credit has a great positive effect on small – scale farmers or rural farmers as most farmers invested or used the agricultural loans they procured on agricultural production activities. Therefore, Commercial banks and other credit institutions should improve upon their loan procedures, so as to grasp more farmers to have access to their credit sources and loan should be disbursed to farmers with minimum delay will enable farmers meet their farm needs in the right season and increase in their farm output.

Keywords: Effect, Agricultural credit, Small Scale, Rice, Farmers, Taraba State.

Introduction

Nigeria having an estimated population of 180 million with more than 80 percent of the population living in rural areas and a land mass of 351, 650 square miles (NBS, 2018) is predominantly an agricultural country. In spite of the pre-emergent position of the petroleum sub-sector, especially in the area of income generation, the agricultural sector still plays a major and significant role in the overall economic growth and development of the country, (Olarinde *et al.*, 2011). The greatest challenge facing developing countries today is to reduce hunger and poverty. The challenge is greater in rural areas where employment and supplies are not as readily available as in the town (Youndeowes and Akinwumi, 2004).

The role of credit in boosting the agricultural sector, have long been recognized by development economists. Strands of literature have shown that the supply of credit to agricultural sector is a key path in achieving sustainable growth in the sector and reduction of poverty among the populace (Adeola and Ikpesu, 2016; Anetor *et al.*, 2016). The supply of credit to the agricultural sector not only stimulates but also strengthens the growth of the sector (Obansa and Maduekwe, 2013). In a similar vein, Ruete (2015) documented that the engine for sustainable growth is having access to credit to finance the agricultural sector.

The government in a bid to boost rice production and make the country self-reliance in rice production completed the Zauro irrigation project, provided inputs (improved seedling and fertilizers) and set up various development schemes to encourage rice farmers. In addition, land concessions were granted to large scale farmers as an incentive. The government through the Central Bank of Nigeria (CBN) provided funds to rice farmers at affordable rates through the anchor borrower's programme (PWC report).

According to Bolarinwa and Oyeyinka (2005) who observed that inadequate credit provision and poor marketing systems reduce agriculture production drastically, to the extent that food importation increased in recent years. According to them, the agriculture in Nigeria and most other developing countries that depend on small scale farmers, several constraints and barriers appeared insurmountable, and limited the farming activity, which reflects heavily on the economy of the country. Food Agricultural Organization (2000) reported that rural people need credit facility to allow investment in their farms and small businesses, because lack of credit plagued poor farmers and rural dwellers for many years.

As reported by Oladejo, (2008), the reason of the decline in the contribution of agriculture to the economy is because of the lack of the formal national credit policy and paucity of credit institutions that should assist farmers. Therefore, improvement of the economic condition of the farmers to be self-sufficient and self-reliant in food production is therefore necessary by supporting them, especially in the procurement of inputs. Although successive governments came up with numerous programs to address the inability of agricultural output to keep pace with the country's demands from the agricultural products, on the other side the credit institutions over the years shy away from lending to small-scale farmers, who form the larger part of the population. This is because of high default rates, difficulty in monitoring numerous individuals whose loans do not provide much return to the investment, as well as ineffective costs (Jamala, 2011).

In Nigeria only a few empirical studies have been carried out to quantify the effects of credit in stimulating agricultural output and production in order to provide a basis for micro credit advocacy as a strategy for rural development. Abdulrahim *et al.* (2016) research findings showed that agricultural credit has influenced the growth of export in Nigeria. Similarly, Adetiloye (2012) findings showed that in Nigeria, agricultural credit has impacted positively on the agricultural sector. Using logit regression analysis Hussain and Taqi (2014) concluded that agricultural credit has positive influence agricultural output in Pakistan. Also, employing a simple regression model, Ammani (2012) showed that through agricultural credit, agricultural output has been increased. Furthermore, Anetor *et al.* (2016) concluded that credit supply affects agricultural output positively. Using the ordinary least square method of multiple regressions, Bongomin *et al.* (2018) research findings revealed that in Nigeria, agricultural credit has positively influenced agricultural output. Furthermore, Badiru, (2010) concludes

that in South Africa, agricultural credit has a significant impact on agricultural output. In addition, Khan *et al.* (2015) findings showed that agricultural credit positively influenced agricultural output in Pakistan. Research findings by Phillip *et al.* (2015) indicate that in Nigeria, the relationship between agricultural credit and agricultural output is a long-run relationship. In a similar vein, Samson and Obademi (2018) concludes that credit supply influence agricultural output in Nigeria positively. Ogundele and Okoruwa (2006) research findings also showed that access to formal credit significantly improved rice farming. The researchers thus recommend the introduction of special credit scheme for the production of rice. Similarly, Adesiji *et al.* (2011) research findings showed that through access to agricultural credit, rice farmers have been able to increase their output. The study also indicates that cooperative societies, esusu, savings groups and banks are the main source of credit to rice farmers. In addition, their study further highlighted the hindrance faced by rice farmers which includes lack of collaterals, insufficient fund, and high rate of interest. Despite the relatively abundant researches on effect of agricultural credit on production of small-scale rice farmers across Nigeria, there is need for additional research in certain locations, particularly in Southern Taraba State. The question is that has the agricultural credit affect farmers' production and improved the livelihood of the farmers specifically in the study area? Or was it just another intervention that failed to achieved the desired effect. Therefore, it is proper to examine the effect of agricultural credit on small-scale rice farmers in the study area.

Methodology

The Study Area

The study was conducted in southern Taraba State of Nigeria. Southern Taraba is made up of five Local Government areas (Takum, Wukari, Donga, Ussa, and Ibbi) and one special Development Area (Yangtu) which cover parts of Zones II and III of Taraba State Agricultural Zones. Taraba state has sixteen (16) Local Government Areas and two special Development areas

(SDAs) which are stratified into four agricultural zones by Taraba State Agricultural Development Programme (TADP) namely; Zone I, Zone II, Zone III and Zone IV (TADP 2019). Zone I comprised of Ardo-kola, Jalingo, Lau, Karim-lamido, Yorro and Zing with headquarters at Zing. Zone II has Wukari, Ibi, Gassol and part of Bali (Garba-Chede/Dakka) LGAs with headquarters at Wukari. Zone III comprised of Takum, Donga, Ussa, Kurmi, part of Bali (Bali/Suntai) LGAs and Yangtu Special Development Areas (SDAs) with headquarters at Takum., and Zone IV has only Sardauna LGA because of its difficult terrain with headquarters at Gembu. Taraba State was created in 1991 and covers a land mass of 59,400km² with an estimated population of 2,300,736 (NPC, 2006). The National Population Commission had projected an annual growth rate of 3.5% which brought the population figure to Three million, five hundred and ninety-seven thousand, ninety-four people (3,597,094) as at 2019. Taraba State is situated at the north eastern part of

Nigeria. It lies between latitude 6° 30' and 8° 30' north of the equator and between longitude 9° 00' and 12° 00' east of the Greenwich meridian. The state shares boundaries with Bauchi and Gombe states in the north, Adamawa state in the east, and the Cameroon Republic in the south. The state is bounded along its western side by Plateau, Nassarawa and Benue states (Oruonye and Abbas, 2011).

Sources and Type of Data

Primary data were used for this study. The data were collected with the aid of structured questionnaire. Data were collected on socio-economic characteristics of the farmers (age, gender, marital status, household size and educational level) and other relevant information on farm characteristics such as farm size, farming experience, sources of credit, land ownership pattern, annual farm income and output. **Sampling Technique and Sample Size** The farmers in the study area who benefited from agricultural credit formed the population of the study. Multi-stage sampling techniques were employed in the study. Southern Taraba has five Local Government Areas (Donga, Ibi, Takum, Ussa and Wukari). In the first stage three Local Government Areas were purposively selected out of the five Local Government Areas, based on their predominance in rice production. In the second stage, five villages were randomly selected from each of the selected Local Government Areas given a total of 15 villages. In the third stage farmers were randomly selected in proportion to the population of the farmers in the selected areas given a total of 139 respondents. The respondents were obtained from Taro Yamane (1967) formula of sample size giving as follows:

$$n = \frac{N}{1 + N\varepsilon^2}$$

Where,

n = sample size,

N = Population of rice farmers, ε = adjusted margin error.

Analytical Technique

The data collected from the field, were analyzed using frequency, percentage mean and double log production model. The frequency percentage and mean were used to describe the socio-economic characteristics, credit sources and the constraint. The double log function was used to determine the effect of Agricultural credit on rice production.

Model Specification

Double log production function was chosen as the best fit equation among the four functional forms of regression analyses. The general form of the production function is given as:

$$Y = f(X_1, X_2, \dots, X_n) \quad (1)$$

The Double log production function is expressed as follows:

$$\ln Y = b_0 + b_1 \ln X_1 + b_2 \ln X_2 + b_3 \ln X_3 + b_4 \ln X_4 + b_5 \ln X_5 + b_6 \ln X_6 + b_7 \ln X_7 + b_8 \ln X_8 + b_9 \ln X_9 + b_{10} \ln X_{10} + b_{11} \ln X_{11} + \mu \quad (2)$$

Where

Y = Output (kg)

X_1 = Farm size in (Ha)

X_2 = Fertilizer (in kg)

X_3 = Amount of seed (in kg)

X_4 = Herbicide/insecticides (litres)

X_5 = Hired labour (in man days)
 X_6 = Family labour (in man days)
 X_7 = Amount of loan collected (in naira)
 X_8 = Age (in years)
 X_9 = Family size
 X_{10} = Marital status
 X_{11} = Farming experience (in years) μ = Error term.

Results and Discussion

Socio-economic Characteristics of the respondents

The socio-economic characteristic of small-scale rice farmers in southern Taraba State, Nigeria is presented in Table 1. The Table indicated that the larger number of the respondents falls within the mean age of 42 years, represented by 46 percent followed by farmers within the age range of 50 - 60 represented by 31 percent and 20 – 29 represented by 23 percent. This finding is against the general assumption that the farming business is dominated by aged people (Akinbile, 2012). The result suggests better days ahead for rice farmers in the study area. The setback is that ownership of factor of production such as land, and capital is usually limited for young farmers. The results also revealed that majority (76%) of the respondents were male, while 24% of the respondents were females. This indicates that males have more access to loan than their female's counterpart. This finding is against Sender and Smith (2014) who reported that about 70% of women in rural areas are engaged in agriculture and provide 60 – 80% of agricultural labour. This can be attributed to the fact that males always have more title to land as a productive resource than their female's counterpart. The marital status of respondents showed that, majority (67%) of the respondents in the study area were married, while single and widow farmers were accounted for 19% and 14% respectively. This suggests that fewer youths were into farming as against the larger proportion of married adults, in the study area. This implies that the majority (67%) of the respondents were married and within the productive and child bearing age thus, they have children and other dependents in their household. The result is in consonant with the findings of the Oladejo, (2016) that conducted research on rice farmers in Osun State and found that over 80% of the respondents were married. The result revealed that, majority (50%) of the respondents has household size of 5-10 members representing 50 percent of the total of the respondents. While the respondents with household size of 1–4 were 30 percent, while only 20 percent of the total respondent had household size of 10–15 members. The mean household size was 8 persons. This means that, there was a ready supply of family labour for farm operation in the study area. Nwaru *et al.* (2006) asserted that labour is a determinant of farm size, because it explains why respondents with larger household sizes owned large farm sizes than the majority with small household size. This finding is in agreement with the result of Buba (2012) who reported that household size is related to number of household members that will be available for farm work. Household size is also very important in this study due to the fact that most of the respondent in the study area depend on their family for farm labour against most small-scale farmers who cannot afford the cost of hired labour except they have access to credit facilities. Result on educational level showed that most (81%) of the respondents

had one form of education or another. The highest proportion of the respondents had secondary education accounting for 35 percent, while 24 percent and 22 percent had primary and tertiary education respectively. The remaining 19 percent had no any formal education. This fact agrees with the observation of Ochi *et al.* (2015) that illiterate farmers cannot organize their business activities in such a way that would produce adequate information to credit institutions. Oladejo (2016) stated that Education is considered as a very important determinant of the progressive nature of farmer. It influences farmer's adoption of credit and other innovation including the farmer's managerial ability. The result also indicated the distribution of the respondents according to their years of farming experience. A large proportion of the respondents had been farming for more than 10 years (46%) followed by 22 percent who had been farming for more than 15 years. This implies that the respondents have larger farming experience and have become well established financially and to invest more in other businesses outside farming. The farming experience of the farmers is an indication of his expertise in farming (Buba, 2012). The distribution of respondents based on sized of farm holding shows that very large proportion of the farmers cultivated 0.5 - 5 hectares, accounting for 48% of the respondents. On the other hand, 15% of the respondents cultivated 10 hectares and above. The mean farm size cultivated by the respondents was found to be 7 hectares. Meaning an average farmer in the study area was able to cultivate 7 hectares. These findings agree with Akinbile (2012) that rural farmers are characterized by a predominance of small holdings and very low operating capital and the small-scale farmers only produce what to eat with little to sell. Hence, they have low-income base, low savings and low level of investment.

Table 1: Socioeconomic characteristics of the Respondents

Variables	Frequency	Percentage (%)
Age		
20 – 29	32	23
30 – 39	23	17
40 – 49	41	30
50 – 59	35	25
60 – 69	8	6
Mean	42	
Sex		
Male	106	76
Female	33	24
Marital Status		
Single	27	19
Married	93	67
Widow/Widower	19	14

Household size

Small household (<5)	41	30
Medium household 5 – 10	70	50
Large household >10	28	20

Educational level

Non formal education	26	19
Primary education	34	24
Secondary education	49	35
Tertiary education	30	22

Farming experience

5 – 10	28	20
11 – 15	64	46
16 – 20	30	22
21 – 25	17	12

Farm Size (ha)

0.5 – 5	67	48
5 – 9.5	52	37
10 and Above	20	15

Mean

7

Total

139

100

Source: Field Survey, 2019

Distribution of Farmers Based on Source of Credit

The result in Table 2 showed the distribution of respondent's base on sources of credit. It revealed that credit from non-institution such as friends and relatives, money lenders, thrift and credit and cooperative accounted for about 75%. While, credit from institutional source such as Bank of Agriculture and commercial banks accounted 25%. This implies that bulk of the credit that was used by the respondents emanated from non-institutional sources of credit. The implication is that not all farmers in the study area can have access to the non-institutional sources of credit. Loans from non- institutional sources prevents administrative delays, non – insistence of the lender on collateral security from the farmers and flexibility built into repayment programmes has charges, extremely popular among the peasant farmers who incidentally form over 70 percent of the Nigeria farming population. The non – institutional source includes friends, relatives, neighbors', money lenders and merchants (Akinbile, 2012). It was noticed that a non – formal institutional credit source, the thrift and credit (Adashe) had 25% adoption rate. This was due to their flexibility in lending regulations and familiarity with the farmers in the communities (Philip *et al.*, 2009).

Table 2: Distribution of farmers based on source of Credit

Source	Frequency	Percentage (%)
Friends/Relatives	29	21
Money Lenders	23	17
Thrift and Credit	35	25
Bank of agriculture	18	13
Commercial Bank	17	12
Cooperative	17	12
Total	139	100

Source: field Survey, 2019

Distribution of Annual Farm Income of Respondents

Table 3 shows the percentage distribution of average annual farm income of respondents is represented by ₦368,662. The Table indicated that, 50% of the beneficiaries of credit (farmers) had an average annual farm income of above ₦500, 000. This finding is in agreement with the findings of Eze and Ibekwe (2007) observed that farmers who have access to production sources have higher income and better welfare than those who do not. Eze and Ibekwe (2007) posited a universal relationship between net loans received and level of income in Nigeria. According to them, on the average, only the wealthiest households were the credit recipients.

Table 3: Distribution of Respondents according to their annual income

Annual Income	Frequency	Percentage (%)
0 – 100,000	31	22
101 – 200,000	14	10
201 – 300,000	14	10
301 – 400,000	5	4
401 – 500,000	5	4
501 – 600,000	70	50
Mean		368,662
Total	139	100

Source: field Survey, 2019.

Distribution of respondents Based on average yield (output)

Average yield (output) of respondents is represented by 3,240 kg of rice. The farmer enterprise is very important especially in determining how much money the farmer will earn at the end of the production activities. It is assumed that farmers have higher credit repayment tendencies when they experienced high levels of output which leads to higher income. Table 4 shows the percentage distribution of farmers according to average annual yield (output) in bags of Rice, which indicated that 32% of the respondents have higher annual yield of 51 – 60 bags of rice.

Table 4: Distribution of respondents Based on average yield (output)

Yield (Output) in no. of bags	Frequency	Percentage	Kg
11 – 20	37	27	2700
21 – 30	12	9	900
31 – 40	21	15	1500
41 – 50	24	17	1700
51 – 60	45	32	3200
Mean	36		3600
Total	136	100	

Source: Field work, 2019.

Influence of Agricultural Credits on Rice Production among Small Scale Farmers

The effect of Agricultural credit on rice production among small scale farmers was determined using double log regression analysis. The double log function gave the line of best fit based on the economic, statistical and econometrics criteria. The R^2 of the equation is 0.77 showing that 77% variation in the output of rice production among the small-scale farmers were explained by the independent variables. About 23% of the variation could not be accounted for by the independent variables due to other factors that was not Incorporated into the formula.

From the result as shown in table 5, it was revealed that family labour was statistically significant at 1% level of probability and positively related to output, with the coefficient of (4945.577) meaning increased in family labour will equally lead to increase in rice production. The coefficient of farm size (430.4409) was significant and positively at 5% level. This means that the greater the farm size, the greater the amount of agricultural credit acquired. This is because increase in farm size will lead to increase in farm inputs and subsequently increase profit and more quests for loan, this conforms to a *priori* expectations and corroborates that increase in farm size increases amount of acquire loan (Essein 2009).

The coefficient of fertilizer (2578.189) was positive and statistically significant at 5% level. This implies that an increase in this variable is expected to lead to an increase in the output of rice. This is in line with a *priori* expectation. The coefficient of the amount of loan (1006.286) was significantly positive at 5% level. This implies that an increase in these variables is expected to lead to an increase in the volume of agricultural credit collected. This is in line with the a *priori* expectation. According to Afolabi, (2008), formal credit sources are not willing to extend loans to small scale farmers, due to their low level of loan repayment. This is in agreement with a *priori* expectation. The coefficient of marital status (1486.563) was statistically significantly at 5% level and positively related to output of rice. This implies that any increase in their variables would lead to an increase in level of credit obtain, the posture of this results implies that single farmers in the study area acquire less agricultural credit.

Married farmers have relatively larger household sizes, which serves as a drive to obtain agricultural credit in the area. Also lenders view married farmers as being relatively more stable, responsible and capable of repaying borrowed funds. The quantity of seed, farming experience were statistically significant at 5% level and positively

related to rice output in the study area. The coefficient of age (44.7636) was positively correlated to output and statistically not significant.

This result implies that the amount of agricultural credit acquire by farmers decreases with age. The result is in agreement with a *priori* expectation. Older farmers are relatively more risk averse and tend to acquire fewer loans to avoid loan default. The result agreed with a *priori* expectation F_{cal} 4.36408 and probability $P > 0.000015$, showing the goodness of fit of the regression line.

Table 5: Influence of agricultural credits on small scale rice farmers

Variable	Coefficient	Std. Error	t-statistic	Prob.
C	56711.84	10532.31	5.384556	0.0000
Farm Size	430.4409	173.4493	2.481657**	0.0455
Fertilizer	2578.189	998.7955	2.581299**	0.0110
Quantity of seed	508.4957	251.0044	2.025879**	0.0411
Herbicide	-506.5648	809.6998	0.625620 ^{NS}	0.5327
Hired Labour	820.5798	832.1869	0.986052 ^{NS}	0.3260
Family Labour	4945.577	962.5141	5.13819***	0.0000
Amount of loan	1006.286	484.4891	2.077004**	0.0398
Age	444.7636	1387.394	0.320575 ^{NS}	0.7491
Family Size	1066.229	907.3084	1.175156 ^{NS}	0.2421
Marital status	1486.563	592.086	2.511086**	0.0239
Farming Exp.	211.4078	84.5889	2.516714**	0.0303
R-squared	0.774306			
F-statistic	4.364081			
Prob (F-statistic)	0.000015			

*** Significant at 1% ** Significant at 5%, NS = Not significant Constraints encountered by farmers

Among the constraints listed by farmers in the study area include, inadequate finance, inadequate labour, inadequate input and others. It is obvious that finance with mean value of 3.2 is a critical problem affecting most farmers. They lack sufficient finance to hire labour and procure inputs, since their production is consumption oriented little or no excess is left for sell to get money. As stated by Olukosi *et al.* (2014), unless production credit is made available on suitable terms, majority of small-scale farmers will be seriously handicapped in adopting profitable technology. Table 6 indicates that the farmers are faced with financial problems, with mean value 3.2, implying that inadequate finance was found to be highly severe by the rice farmers. Also, inadequate input with mean value of 3.2 as indicated by the farmers show that the problem is highly severe, while problem of labour was moderately severe as indicate with the mean value of 2.8 this implies that the labour supply in the study area

was low this could be as a result of low participation of active youth in the supply of labour affected by rural-urban migration. Delay in loan disbursement with mean value of 3.2 which shows that it is highly severe in the study area. Distance to credit institution with mean value of 3.1 this implies that it is highly severe, because most of the credit institution are not located close to the farmers. Lack of tangible collateral with mean value of 2.9 this implies that it is moderately severe as some farmers lack tangible collateral to present to credit institutions before credit is being given to them. High rate of interest with mean value of 3.0 this shows that the problem is highly severe; this is so because some commercial banks give high interest rate on credit and this hinders many farmers from taking the loan. The result further shows the grand mean value of 3.1, implying that the constraint faced by the rice farmers in the study area is severe.

Table 6: Distribution of Farmers by Constraint**N=139**

Problem	HS (3)	S (2)	NS (1)	Mean	SD
Inadequate Finance	70	60	9	3.2	26.78
Inadequate Labour	50	69	20	2.8	10.61
Inadequate input	69	60	10	3.2	27.57
Delay in disbursement	60	70	9	3.2	24.15
Distance to Credit institutions	50	75	14	3.1	23.73
Lack of collateral	55	65	19	2.9	15.06
High rate of interest	50	83	6	3.0	19.78
Grand Mean				3.1	

Source: Field Survey, 2019

Conclusion and Recommendation

The coefficient of determinant of the regression R^2 was 0.77 which implies that 77% of the variations in the rice output were explained by the explanatory variables. This indicates that credit has a great positive effect on small – scale farmers or rural farmers as most farmers invested or used the agricultural loans they procured on agricultural production activities. Therefore, Commercial banks and other credit institutions should improve upon their loan procedures, so as to grasp more farmers to have access to their credit sources and loan should be disbursed to farmers with minimum delay will enable farmers meet their farm needs in the right season and increase in their farm output.

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