

Credit and Rice Production among Small Scale Farmers in Niger State, Nigeria

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To some, credit is "all in all" for a farmer to produce (productive input) while others hold different opinions. Whichever way it is looked at, credit is an important instrument in the development of agriculture.

Yandav and Solanki (2008) found out that credit was that input which helped the farmers to apply other inputs like fertilizers, improved seeds, irrigation and modern implements. This position points to the fact that credit though a capital input, may not have a direct effect on-farm production, but only promotes the acquisition of other agricultural inputs. Credit contributes to improvements in net income through maintenance of adequate farm size, adjusting to changing economic conditions, meeting seasonal fluctuations in income and expenditure as well as to protect against adverse conditions. Fan., Shen, Yuan, Jiang, Chen, Davies, & Zhang, (2012)'s study revealed that productivity of crops is increased through the use of purchased inputs such as improved seeds, inorganic fertilizers, pesticides and fungicides. In relation to the use of purchased inputs, many smallholder farmers are frequently severely constrained by capital to afford them. Hence, their need for credit. Igbal, Ahmed and Abbas (2003) in their study using the Cobb-Douglas production function to estimate the impact of institutional credit on agricultural production, found a significant and positive coefficient for agricultural credit at 5 percent level. Nwankwo (2008) also using the same methodology but for a study of the impact on informal credit on Agricultural production in Awka South, Anambra State

ABSTRACT

The study investigated the effect of credit on rice production. A total of 300 respondents were selected from a population of 1,296,032 farmers rice farmers in zone "A" Agricultural Zone of Niger State, Nigeria. Taro Yamane method was used to determine the sample size while the multistage sampling technique was used to allocate the sample strata. A structured questionnaire capturing the issues raised in the objectives designed to elicit raw data from the sample. The data collected were analyzed using both descriptive and inferential statistics (Pearson Correlation and Regression Analyses) and were used to address the objectives and to test the hypotheses respectively. Findings of this study revealed that there were positive and significant relations between credit and rice output ($r = 0.150$; significant @ 0.001 level); and between credit and profitability/gross margin ($r = 0.995$; significant @ 0.001 level. Also, constraints to credit access were found to have significant effect on rice production (F ratio = 9.073; Significant @ 0.001). Based on these findings, it was recommended, among other things, for a credit policy review by the government at the local, state and federal levels to enhance access to credit among the small scale farmers in Niger State Nigeria.

KEYWORDS: credit, farm inputs, rice production, profitability, credit constraints

1. INTRODUCTION

Credit is an important instrument in the development of agriculture. Credit has been the main focus of many research workers in agricultural finance.

realized a result that showed a positive but insignificant relationship between informal credit and agricultural production. Adeoti (2003) empirically determined from a study on poultry farmers in Oyo State that credit constraint was limiting farm productivity among the group.

Jumare (2006) while reviewing some studies conducted by the Food and Agricultural Organisation (FAO), provided that credit plays an important role in increasing agricultural production and that the demand for credit grows as production progresses. According to him: "Credit plays an important role in the agricultural production process by creating and maintaining adequate farm size by helping farmers become owners of land; purchase of operating inputs such as feeds, better seeds, fertilizers, pesticides, and herbicides, which the farmers cannot otherwise afford because of lack of capital; forming an integral part of commercializing agriculture which can lead to an increase in rural savings; providing an incentive for the adoption of new technology which will increase production. Such technologies would otherwise be slowly adopted, or not at all due to lack of credit; increasing efficiency; protection against adverse conditions. Lawal and Abdulahi (2011) found that the informal financial sector in Kwara district of Nigeria impacted positively on agricultural production with rotating savings having the greatest impact, followed by periodic savings.

Although credit is acknowledged as a catalyst for increased farm assets and farm production there are still questions as

to whether it has increased farmers income and farm profitability. In Mali, Beaman, Karlan, Thuysbaert, and Christopher (2015) found that while loans increased the value of farm outputs, it did not increase farm profits. In Morocco, while credit increased income from agriculture, households' overall income did not increase because they chose to work (and earn) less from casual labor once they started earning more from agriculture (Crepon, Devoto, Duflo & Pariente, 2015). Also in Kenya offering credit and services promote exports and encouraged farmers to grow crops that sell at higher prices but did not result in income gains (Nava, Giné, & Karlan, 2009).

In Nigeria, the prevalence of credit constraint and their impact on production efficiency has led to low production on the farmers. Economics of agricultural production at the micro-level is to attain the objective of profit maximization through efficient farm allocation of resources over a period of time or by either maximizing output from given resources or minimizing the resources required for producing a given level of output (Asogwa, 2014). Different farming households will have different needs for credit but a good sign that indicates some level of credit constraint is the gap between demand and supply of credit. Credit constraints can be defined as a wide gap between demand for credit and supply of credit (Okoruwa, Odu & Olusola, 2014). Thus, credit constraint to farm households in Nigeria imposed a high cost on the society in terms of rural unemployment, rural poverty, distortion of production and liquidation of assets (Rahji and Adeoti, 2010). This problem was also aggravated by the absence of perfect information about the financial market among smallholder farmers which encouraged rationing of credit and rejection of loan applications of farmers by formal financial institutions to them. Given a subset of credit-constrained and unconstrained rice farmers in Niger State using similar inputs to produce the same outputs, Okoruwa et al. (2014) attempt to substantiate the effect of credit constraint condition on the profit of the former group as against the unconstrained subset of farmers. The result of his findings showed that unconstrained rice farmers achieved more output than the constrained, this in turn, contributed to higher income.

Niger state has emerged a major player in the Nigerian economy with the latest interest to grow the rice sector. At a period in which self-sufficiency in food production is the responsibility of any government at the national and state level, Niger state has over the years, remained a leading contributor to agricultural productivity in the country at the regional and state levels (Adesina, 2013). According to Niger State Bureau of Statistics (2012), since 2001 – 2011, per hectare yield levels in a variety of major crops in the state have not only increased but exceeded expectations. In the process, the Niger state has outpaced many states in several statistical categories used to measure the production of major crops. Another dimension to the potentials of Niger state as major agricultural state stems from its geographic position which comes with the added physiographic and bio-geo-climatic advantages it enjoys in terms of weather and soil capabilities which others lack (Merem, Ochai, & Nwagbaoso, 2017). Being a major hub with vast production acreage and the third among rice-producing states of the nation, the state is still dominated by subsistence farming. The absence of a strong private sector in that setting to

harness the immense potentials of the agro industry coupled with low levels of investment makes the state one of the least developed in the country. There are several sectoral challenges impeding agricultural activities in the state. The challenges include inadequate and high cost of basic farm inputs such as improved seeds/planting materials, organic and inorganic fertilizers and agro-chemicals; lack of agricultural credit facilities, insufficient and high costs of agricultural equipment and machinery.

Small scale farmers have consistently found it difficult to access credit to boost rice production as many of them do not have collaterals and financial capacity to meet banking requirements to secure loans. Hence this study ventured to evaluate small scale rice farmers' access to credit and its impact on agricultural production in Niger state.

The broad objective of this study was to examine the effect of credit on rice production among small scale farmers in Niger State, Nigeria. Specifically, the study determined the relationship between credit and rice output; examined the relationship between credit and rice profitability, and evaluated the effect of constraints to credit access on rice output.

2. METHODOLOGY

The Study Area

The area of study was zone A (Niger South) agricultural zone which consists of Bida, Agaie, Edati, Lapai, Lavin, Gbako, Mokwa and Katcha local government areas of Niger State. Niger State was created on 3rd February 1976 from the defunct North-Western State during the regime of General Murtala Ramat Mohammed. Niger State has a total land area of 68,925 Sq. Km and lies between the latitude of 3.20' 2east and longitude 8 and 11.3' north (Nigerian Investment Commission, 2016). It is bordered to the north by Sokoto State, west by Kebbi State, south by Kogi and south-west by Kwara State. Kaduna and Federal Capital Territory border the State to both north-east and south-east respectively. The State also has an International Boundary with the Republic of Benin along Agwara and Borgu LGAs to the North West. Niger State is in the North Central zone and the state capital is Minna with about twenty-five local government areas. 91 percent of village households in Niger State are engaged in rice production (Olusola et al. 2014). The state experiences distinct dry and wet seasons with annual rainfall varying from 1,100mm in the northern part of the State to 1,600 mm in the southern parts. Generally, the climate, soil and hydrology of the state permit the cultivation of most of Nigeria's staple crops especially rice. With respect to production levels, the highest hectareage of rice under cultivation is that of rain-fed lowland while the lowest is that of mangrove swamp (Olusola et al., 2014). Rice production is predominant in Shiroro, Lavun, Paikoro, Katcha and Gbako local government areas of the state.

The population for this study was the entire small scale rice farmers in zone A Agricultural zone of Niger State. Since it was impracticable to study the entire population, a sample of the population was determined using Taro Yamane (1964) for the study.

A multistage sampling technique was used to select 5 rice-producing villages from each of the 8 LGAs of the Agricultural zone making a total of 40 villages. Subsequently, from each of these 40 villages, 10 rice farmers were selected

using randomized sampling design which amounted to 400 respondents.

Data for this study were obtained mainly from primary sources. The primary source of information was obtained using a structured questionnaire, copies of which were administered to the 400 respondents selected for the study. However, only 300 copies of the questionnaire were returned and found to be usable.

Collated data were analyzed using both descriptive statistics and inferential statistic. Descriptive statistical tools used include meaning, percentages, and frequency distribution table. The inferential statistic used was the Pearson Product Moment Correlation and Linear Multiple Regression Model. Hypotheses one and two were tested using Pearson Product Moment Correlation; while hypothesis three was analyzed and tested through the use of regression analysis.

The empirical model used to evaluate the influence constraints to credit access in hypothesis three were specified as

$$Y = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + e$$

Where:

Y = Farm output in Naira

X₁ = Lack of collateral

X₂ = Bank is far away

X₃ = High interest rate

X₄ = Inadequate credit information

X₅ = Application procedure is complicated

X₆ = Delay in approval and disbursement of credit

The α and β s are the parameters to be estimated and the ϵ is the error terms designed to capture the effect of unspecified variables in the models.

3. RESULTS

Table1. Descriptive Statistics on credit, rice revenue and profitability of rice farming

	N	Sum	Mean	Std. Deviation
Credit obtained	300	52947420.00	176491.4000	39774.87562
Rice revenue (Naira)	300	357666060.00	1192220.2000	965386.72774
Rice output (kg.)	300	1490275.25	4967.5841	
Farm resources used				
Farm size (ha)	300	1084.00	3.6133	1.32021
Labour (no. of adults)	300	1228.00	4.00	2.91197
Rice seed (cost in Naira)	300	3587111.25	11957.0375	2425.58473
Fertilizer (cost in Naira)	300	2869689.00	9565.6300	1940.46778
Credit obtained (Naira)	300	52947420.00	176491.4000	39774.87562
Total variable cost	300	57393780.00	191312.6000	38809.35569
Gross margin (Naira)	300	300272280.00	1000907.6000	965066.50073
Gross margin (%)	300	83.95	83.95	
Gross margin/hectare	300	105254507.50	350848.3583	455865.64747
Valid N (listwise)	300			

Table 1 shows descriptive statistics and analysis of credit, rice production and profitability of rice farming by the respondents. A total credit sum of N52,947,429 was obtained by the 300 respondents from credit institutions in the study area. This translates to an average of N176,491 per member. Also revenue from rice output grossed N357,666,060 or an average of N11,922,220 per farmer.

Farm resources utilized by the respondents included average farm size of 3.6 hectares, labor provided by four adult members of respondents household, rice seeds of about N11,957.04, fertilizer of N9,565.63, and credit obtained from financial institutions of N176,491.40.

The table also shows that the total variable cost incurred by all the respondents was N57,393,780 or an average of N191,312.60 per farmer. The major variable costs incurred, was revealed by the respondents to include payment for land clearing, labour cost, fertilizer, rice seeds, weeding, and rice processing accounting. Examining the table further, it is seen that a total gross margin of N300,272,280 or an average per member of N1,000,907.60 was realized by the respondents. This then implies a gross margin of almost 84% over rice revenue. It is also seen that the gross margin per hectare was calculated as N350,848.36. These high gross margin figures indicate the generally high efficiency of the respondents in their rice farming activities.

Table2: Constraints to micro credit access (n=300).

Constraint	Sum	Mean	Standard Deviation	Decision
Bank insist on adequate accounting record	1109.00	3.6967	.98040	Agree
Bank is far away	1001.00	3.3367	1.26305	Agree
Small farm land	989.00	3.2967	1.37171	Agree
No collateral	970.00	3.2333	1.34844	Agree
Lack of guarantor	964.00	3.2133	1.33933	Agree
Delay in approval and disbursement of loan	911.00	3.0367	1.34214	Agree
High interest rate	877.00	2.9233	1.26072	Disagree
Application procedure is complicated	846.00	2.8200	1.31149	Disagree
Grand mean	1084.00	3.6133	1.14490	Agree

Source: Field survey 2018.

Table 2 sought the views of the respondents on the various constraints that confront them in micro-credit access production. The table shows that there is commonality of agreement in six out of the eight indicated constraints: Bank insist on adequate accounting record (3.7); Bank is far away (3.3); Small farmland (3.3); No collateral (3.2); Lack of guarantor (3.2); Delay in approval and disbursement of loan (3.0) inadequate capital (3.43); land tenure act (3.29); and pest and disease (3.31). The other two responses: High-interest rate (2.9); and Application procedure is complicated (2.8) had mean ratings of less than 3.0. The grand mean however had a mean rating of 3.6. Furthermore, the relative importance of the items could also be assessed from the magnitude of their individual mean scores. Thus, the most important item of influence was Bank insists on adequate accounting record (3.7). This was followed by the Bank is far away (3.3). The implication of the above is that the constraints as indicated could have a substantial influence on rice production in the area.

Tests of Hypothesis

Credit and rice output relationship

Test of hypothesis one

H₁ Credit is not significantly related to rice output.

H₂ Credit is significantly related to rice output.

Table3: Correlations between credit and rice output

		Credit	Rice output
Credit	Pearson Correlation	1	.150**
	Sig. (2-tailed)		.009
	N	300	300
Rice output	Pearson Correlation	.150**	1
	Sig. (2-tailed)	.009	
	N	300	300

** . Correlation is significant at the 0.01 level (2-tailed).

Decision: The result of the Pearson correlation analysis between credit and rice output and is presented in table 3. The research outcome showed that credit had a positive sign, though weak, relationship with rice output ($r = 0.009$; significant @ 0.001). Thus, the strength of the relationship between the two variables was found to be very weak: only 0.009. The relationship was however positive and significant, suggesting that an increase in the amount of farm credit to the farmer could result in increased rice yield. On the basis of the above outcome, the null hypothesis is rejected and it is concluded that credit is significantly related to rice output.

Credit and rice profitability relationship

Test of hypothesis two

H₁ Credit is not significantly related to rice profitability.

H₂ Credit is significantly related to rice profitability.

Table4: Correlations between credit and rice profitability.

		Credit	Profit (gross margin)
Credit	Pearson Correlation	1	.955**
	Sig. (2 tailed)		.000
	N	300	300
Profitability (Gross margin)	Pearson Correlation	.955**	1
	Sig. (2 tailed)	.000	
	N	300	300

** . Correlation is significant at the 0.01 level (2-tailed).

Decision: The result of the Pearson correlation analysis between credit and rice profitability is presented in table 4. The strength of the relationship between the two variables was very strong: 0.955. It was also found to be positive and significant at less than 1% level of analysis. The null hypothesis is therefore rejected and it is concluded that credit is significantly related to rice profitability. This finding appears to suggest that as credit increases, rice profitability as proxied by gross margin also increases.

Influence of constraints to credit on rice output

Test of hypothesis three

H₁ Rice output is not significantly influenced by such constraints as high labor cost, the inadequacy of capital, scarcity of improved rice seeds, and pests and diseases.

H₂ Rice output is significantly influenced by such constraints as high labor cost, the inadequacy of capital, scarcity of improved rice seeds, and pests and diseases.

Table5: Influence of constraints on rice output (Regression Estimates).

Model	Coefficient Estimates	t-Value	Significance
(CONSTANT)	11.729	8.801	0.000
Bank is far away	-1.465	-.247	0.000
Small farm land	-1.063	-.548	0.011
No collateral	0.094	0.246	0.806
Lack of guarantor	0.466	1.301	0.194
Delay in approval and disbursement of the loan	-0.363	-.968	0.334
High interest rate	0.198	0.440	0.660
Application procedure is complicated	-0.241	-0.607	0.544
R^2	0.139		
Adj R^2	0.124		
F	9.073 (Sig. @ 0.001)		

Dependent Variable: Rice output

The coefficient of multiple determination, R^2 , was 0.139, while the adjusted R^2 was 0.124. Thus, not more than 14% of the variations in rice output was explained by the constrained indicated in the model. The F ratio value of 9.073 was significant at 0.001 level of significance. Table 5, also shows that the bank is far away and small farmland were the only constraints that were significant at the conventional 5% level and had inverse relationships with rice output. The significance of the two variables suggests that each unit of the response of bank is far away and small farmlands in the reduction of rice output by 1.465 and 1.063 respectively.

Decision: From the regression analysis in table 5, the F ratio value of 9.073 was significant at less than 1% level of significance. Based on this the null hypothesis which stated that rice output is not significantly influenced by such constraints as high labor cost, the inadequacy of capital, scarcity of improved rice seeds, and pests and diseases is rejected and the alternative is accepted. Thus, we conclude that rice output is significantly influenced by such production constraints as high labor cost, the inadequacy of capital, scarcity of improved rice seeds, and pests and diseases.

4. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

The outcome of the research showed that credit has a positive and significant relationship with rice output. ($r = 0.150$; significant @ 0.001 level). This finding is consistent with those of Nwankwo (2008); Igbal, Ahmed and Abbas (2003) and Jumar who found a positive relationship between credit and agricultural production. It is however at variance with those of Yandav and Solanki (2008), and Fan et al (2012) who posited that credit is only needed to purchase farm inputs such as seedlings, fertilizers and farm chemicals and therefore do not have a direct impact on farm output.

The research outcome equally showed a positive and significant relationship between credit and rice profitability ($r = 0.955$; significant @ 0.001 level). This outcome is however at variance with the finding of Beaman, Karlan, Thuysbaert, and Christopher (2015) in Mali who found that an increase in credit access did not translate to an increase in profit.

Finally, results of the study showed that rice output is significantly influenced by such production constraints as high labor cost, the inadequacy of capital, scarcity of improved rice seeds, and pests and diseases (F ratio of 9.073 was Significant @ 0.001). Indeed, an analysis of the effect of these constraints showed that they collectively constituted a

significant bottleneck in rice production. However, the regression analysis showed that only two variables: the bank is far away and no collateral was statistical significant constraints that impeded rice production in the area. In any case, our findings are consistent with previous studies that revealed that access to credit was significantly determined by family size (Oboh & Ekpebu, 2011; Saleem & Jan 2011; Sebopetji & Belete, 2009).

In conclusion, the study has shown the primacy of credit in the entire farm production milieu. There is therefore the need for a thorough re-assessment of the credit policy in Nigeria by governments at all levels: local, state and federal governments. Since inadequacy of credit is an obvious constraint to rice production, bearing in mind that it is a capital and labor-intensive enterprise and requires cash to undertake most of the farming operations, there is a need for an increase in farmers access to credit and in the quantum of credit they receive. Microfinance banks should also be encouraged to enhance their credit operations in the rural sector. Finally, governments at various levels in the country should come up with a policy that would minimize the difficulties encountered in accessing credit by small scale farmers.

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