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Analysis of Sources and Socio-Economic Determinants of Acccess to Loan by Smallscale Rice Farmers in Gwagwalada Area Council, Federal Capital Territory, Nigeria

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Abstract

This study evaluated the analysis of sources and socio-economic determinants of access to loan by smallscale rice farmers in Gwagwalada Area Council, Federal Capital Territory, Nigeria. Multi-stage sampling technique was adopted and used. Data were collected through the use of well-structured questionnaires administered to 100 sampled smallscale rice farmers. The following analytical tools were used to achieve the stated objectives: descriptive statistics, gross margin analysis, financial analysis, Cobb-Douglas Production Function, and Probit Regression Model Analysis. The results of the analysis of the socio-economic characteristics of the respondents revealed that the mean age of the sampled small scale rice farmers was 43 years. About 34% could not access formal education and 62% of the farmers had formal education and they can adopt new innovations quickly and also understands the guidelines involved in accessing formal loans. Most of the sampled smallscale rice farmers had less than 2 hectares of farm size. Also, 69% of the farmers had their capital through their personal savings, while 21% through credit borrowing. The average loan accessed from formal sources by smallscale rice farmers was ₦200.754.2 with the maximum interest rate of 36% charged. The average amount of loan accessed from informal sources by the small scale rice farmers was ₦129.558.82 with maximum interest rate of 20%. The study show that rice production is a profitable enterprise in the study area. The results of the Cobb Douglass Production Function analysis revealed that the statistically and significant factors influencing rice production were labour input ($P < 0.01$), chemical input ($P < 0.05$) and fertilizer input ($P < 0.05$). The value of the coefficient of the multiple determinations (R^2) was 0.642. This implies that 64% of the variations in the output of rice was explained by the explanatory variables included in the Cobb-Douglass production model. The results of the Probit model to determine the socio-economic factors influencing access to loan reveal that the significant variables influencing access to loan by smallscale rice farmers were education level ($P < 0.10$) and cooperative memberships ($P < 0.05$). The major constraints faced by smallscale rice farmers were; long distance to financial institutions, high interest rate, cumbersome administrative procedures, short re-payment period, lack of collateral securities and small amount of loan given.

Therefore, the study recommends that loans should be made available to farmers at affordable interest rate preferably single digit. Provision should be made for farmers to have access to tractors, farm machineries and other farm inputs. To encourage them to upgrade and involve in large scale rice production to be able to fill the high demand and supply gap of rice in Nigeria. The education of farmers should be given serious priority, training should be organised for farmers through extension agents in order for them to know the guidelines involved in accessing loans and how to use farm inputs efficiently. Also, farmers should be encouraged to join cooperative organisations in order for them to have access to loan easily, Government should make a provision for special agricultural microfinance banks that should be located in rural areas to meet the need of farmers' loan demand.

Keywords: Analysis, determinants, loan, Nigeria, rice, smallscale farmers

Research article
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INTRODUCTION

Agricultural sector still maintained its position as the major stay of the Nigerian Economy though the performance of the agricultural sector in Nigeria has been relatively poor considering the attitude of the existing financial systems to the support of the agriculture in the country. The Formal institutions that provide loans to the smallscale farmers are usually not located in the areas where rural farmers can reach and there is inadequate information on the sources of formal agricultural credit sector among the rural farming populace (Alabi et al, 2021). Small scale farmers are oftern referred to those that cultivate not more than two hectares of land. They are often limited by inadequate fund among other things. Government has come up with various macroeconomic policies to promote growth of the agricultural sector. Credit-channeling financial policies, price stabilizing monetary and exchange rate policies, and farm incentive-laden fiscal policies including tax exemptions for agricultural businesses, duty-free import of farm machinery are among those the government intend to expand production. Nigerian agricultural policy provides, among others, for adequate financing of agriculture. Just like in the industrial and service sectors the significant of fund in agriculture cannot be over-emphasized, it is just like the oil that lubricates production. Public expenditure on agriculture has, however, been shown not to be substantial enough to meet the objective of the Government agricultural policies (IFPRI, 2008). For a developing country with a mono-product oil economy such as Nigeria's, inadequate financing of agriculture portends great danger for many reasons; continuing inadequate food production, poor youths' engagement in agriculture can lead to hunger and prolong insecurity as experienced in our nation today. So, small scale farmers need loan and not necessarily grant to improve their production.

A loan is money, property, or other material goods given to another party in exchange for future repayment of the loan value or principal amount, along with interest or finance charges. A loan may be specific, one-time amount, or it can be available up to a specific limit (Kagan, 2019). Access to loan by smallscale farmers could increase the willingness of the farming households to adopt and utilize more farming technologies that would result in increased production as well as increased income of the smallscale farmers (Ajah et al., 2017).

Access to agricultural credit facilities is considered as one of the best and key elements in uplifting and raising agricultural productivity. Availability of adequate and timely credit facilities to farmers always help in expanding and increasing the scope of farm operation and adoption of new and modern technologies, it can also enhance to purchase and use of improved seed varieties and other inputs by the smallscale farmers (Kuye and Ogiri, 2019).

The two most important and critical periods that credit is needed by the smallscale farmers is during pre-planting and harvesting periods (Akpokodje et al., 2001), hence, the acuteness of credit facilities is needed at different times during the cultivation season by the farmers. Furthermore, credit facilities are not only needed by the farmers for farming purposes alone, but also for household needs and consumption expenditure, especially during the off-season period when farmers are mostly idle. Rice *(Oryza sativa)* is a unique crop which can be grown virtually in all geological zones all over the country, because the required temperature ranges between 20^{o}C and 38^{o}C during its growth and a long period of sunshine which is obtainable all over Nigeria. The most prevalent type of the rice production systems in Nigeria are the rainfed upland system, rainfed lowland system and irrigated lowland system (Ajah et al., 2017 and Inakwu, 2011). In Nigeria the demand for rice has been on increase at a faster rate than in any other country in Africa since from the time period of mid 1970 (Ajah et al., 2017; Food and Agriculture Organization (FAO 2001; Odoemenem and Inakwu 2011; Ohen and Ajah 2015). Agricultural loan or credit facilities is a very important ingredient for sustainable agricultural development achievement in any country of the world (Ololade and Olagunju, 2013). An agricultural credit facility from formal sources can be defined as money given or extended to farmers for agricultural activities, which enhances productivity, increases production, and improves the living standard and wellbeing of the farmer (Alabi et al., 2021). Loan or credit given to smallscale farmers as a rural loan has proven to be one of the powerful instruments used against poverty reduction, eradication and development in rural areas. Farmers particularly smallscale farmers are actually in need of such instrument (i.e. credits), due to the seasonal nature and pattern of their farming activities and the uncertainty and risk they face in the process of production. Agricultural loan or credit facilities enhances farm productivity, efficiency and also promotes standard of living of the farmers by breaking the vicious cycle of poverty among small scale farmers. Access to loan or credit facilities by these group of poor rural people has the potential and the capacity of making the difference between grinding poverty and economically secured life style as well as the ability for enhancing agricultural productivity.Despite the fact that about 80% of Nigeria's population lives in rural areas and under abject poverty, those majorities are the ones involved in agricultural activities and produce food for the nation, there are no efforts to facilitate credit facilities to farmers which is crucial in rapid development for this dominant group of the population (Obisesan, 2013).

Agricultural efficiency, productivity and growth are hindered by access to loan facilities (Odoemenem and Obinne 2012), only few smallscale farmers have access to rural credit facilities. According to Enhancing Financial Innovation and Access ElnA (2008), 23% of adult population in Nigeria has access to formal financial institution, 24% to the informal services, while 53% are financially excluded from having access to loan or credit facilities. Preliminary observation shows that most new innovations in agriculture inevitably increase the capital requirements of farmers in acquiring the innovation. Improving access to finance and credit facilities is an important aspect that could lead to foster the development in rice sub-sector in Nigeria. Relevant literatures have confirmed that agriculture in Nigeria and many developing countries is constrained by lack of loan (Alabi et al, 2021).

Nigeria has over 40 million smallholder farmers in production line and over 90% of these farmers can't have access to loan facilities from the commercial banks for acquiring inputs, yet agricultural credit is very imperative in small scale farming as it enables them to secure viable inputs such as seeds, equipment and chemicals needed to run a successful farm which in turns yields an increase in agricultural production and poverty reduction.

According to Ogah et al., (2015), loan accessibility and utilization is influenced by farmers' socioeconomic characteristics, the challenges of covering long distance to the bank, insistence on provision of collateral, inadequate loan granted, unwillingness of bank in granting agricultural the loan, high rate of interest charged by private money lenders, delay and difficulty in communication with bank officials in acquiring loan and management cost. Farmers, especially smallholder farmers are faced with different problems among which is the inadequate or restricted access to capital and limited access to loan facilities. Adegbite et al, (2007) noted that loan is required to break the vicious cycle of low productivity in agriculture. Therefore, farm loan or credit facilities remains one of the major means of improving farm capital investment and enterprises. It is generally agreed among researchers, scholars and policymakers that lack of access to adequate loan and credit facilities by smallscale farmers can have significant negative effects and consequences for various individuals and aggregate smallscale farmers' outcome levels, technology adoption by farmers, agricultural productivity, food security, nutrition, health, and overall household welfare in the society. Availability and accessibility to loan and credit facilities by farmers can lead to alleviation of capital constraints faced in agricultural rice production. Most smallscale farmers cash flow is negative during planting season reason is because of expenditures on agricultural inputs is higher than what they earn, and couple with that on food and essential non-food items. Therefore, to finance the purchase of essential production inputs, farm households need to obtain loan. Thus, access to adequate loan and credit facilities can significantly lead to increase in the ability of poor smallscale farmers with little or no savings to acquire production inputs. Without loan accessibility, most smallscale rice farmers have a chance of substantially increasing their production level. This brings to the fore, the importance of poverty level among the farming population as a vital factor in organizing agricultural loan for smallscale rice farmers. Most often this factor is not fully acknowledged and dully implemented. Poverty level has a direct role in technological improvement because its adoption comes with more capital investments implication when incomes of the farmers are low, such risks appear to be great and unbearable. The relative low level of farm income from small scale level of production has limitation and restriction to the operations of the smallscale rice farmers to small enterprises. As a result, this establishes the vicious cycle whereby smallscale farmers always remain as small producers and relatively poor. Therefore, there is need for production loan and credit facilities from formal financial institutions to break the vicious cycle of low income and poverty among smallscale rice farmers. With this in mind therefore, there is need for more realistic and determined efforts to modernize the rice sub-sector through extension of easy access to credit facilities to smallscale rice farmers that fall into this group. Consequently, it will lead to the transformation of their smallholdings to modern commercial production level with increased capacity of the farmer beneficiaries to enhance their repayment performance. Findings from this study will be useful to the academic World and also helpful in policy formulation by policy makers to improve rice production in Nigeria. Hence it is on this background that this study was undertaken.

Research Questions

This study provides answers to the following research questions:

(i) What are the socio-economic characteristics of smallscale rice farmers' loan beneficiaries and non-beneficiaries in the study area?
(ii) What are the sources and amount of loan accessed by smallscale rice farmers in the study area?
(iii) What is the cost and returns analysis of smallscale rice production in the study area?
(iv) What are factors influencing output of smallscale rice production in the study area?
(v) What are the socio-economic factors influencing access to loan by smallscale rice farmers in the study area?
(vi) What are the constraints encountered by smallscale rice farmers in accessing loan in the study area?

Objectives of the Study

The broad objective of this study is to evaluate analysis of sources and socio-economic determinants of access to loan by smallscale rice farmers' in Gwagwalada Area Council, Federal Capital Territory, Nigeria. The specific objectives were to:

(i) determine the socio-economic characteristics of smallscale rice farmers' loan beneficiaries or non-beneficiaries,
(ii) identify the sources and amount of loan accessed by smallscale rice farmers,
(iii) analyze the costs and returns of smallscale rice production,
(iv) evaluate factors influencing output of smallscale rice production,
(v) evaluate socio-economic factors influencing access to loan by smallscale rice farmers', and
(vi) determine the constraints encountered by smallscale rice farmers in accessing loan in the study area

MATERIAL and METHOD

The Study Area

This study was carried out in Gwagwalada Area Council of Federal Capital Territory Abuja, Nigeria. Before the creation of Federal Capital Territory, Gwagwalada was under the Kwali District of the former Abuja emirate now Suleja emirate. The council was created on 15th October, 1984. It is located at the extreme south west near the flood plain of river Gurara which transverses the territory from North to South at an elevation of 70m above sea level. The area lies between Latitudes $8°56^{1}29^{11}$N and Longitudes $7°05^{1}29^{11}$E. It has a land area of 1,043Km^2. The total population of the Area Council is 158,618 people comprising 80,182 males and 78,436 females (NPC, 2006). The population of the Area Council has grown to over 1,000,000 people (Balogun,2006). The vegetation combines the best features of the southern tropical rain forest and guinea savanna of the North. This reflects the full transitional nature of the area as between the Southern forest and Northern grassland which have the woods and shrubs respectively. The soil is reddish with isolated hills filled by plains and well drained sandy clay loams which supports farming of the major crops such as sorghum, millet, melon, yam, soybean, benniseed, cassava and rice cultivation (Abuja ADP, 2004).

The duration of sunshine ranges from 8 to 10 hours per day. The average rainfall per annum is 163.2mm. The original settlers are Gwari, Koro, Bassa, Gade and the Hausa Fulani as well as immigrants population of other Nigerians and expatriates.

Sampling Technique and Sample Size

A multi-stage sampling technique was adopted and used to select target respondents (smallscale rice farmers) for the study. In the first stage, Purposive sampling technique was used to select Gwagwalada Area Council. because of the predominance of smallscale rice production in the area. Second stage five (5) wards were randomly selected using ballot box raffle draw method, they are: Dobi, Ikwa, Ibwa, Paiko, and Gwako. In the third stage, two (2) villages per ward were randomly selected using ballot box raffle draw method making a total of ten (10) villages.

In the fourth and final stage, ten (10) smallscale rice farmers were randomly selected per village using ballot box raffle draw method making a total sample size of one hundred (100) smallscale rice farmers selected for the study.

Method of Data Collection

Data for this study were obtained from primary source. Primary sources of information were obtained using well- structured questionnaires. The questionnaires were designed to collect information on; socio-economic characteristics, these ranges from age, sex, marital status, household size, level of education; sources and amount of loan obtained, farm size, and farming experience. The questionnaires were supported with personal and group interviews needed. The questionnaire comprises of Section A, socio-economic characteristics of rice farmers Section B, sources and the amount of loan accessed by smallscale rice farmers; Section C, costs and returns analysis of smallscale rice production; Section D, labour use in smallcale rice production; Section E, production of output of rice, and Section F, constraints in smallscale rice production and suggested solutions

Method of Data Analysis

The following analytical tools was used to achieve stated objectives:

(i) Descriptive Statistics
(ii) Gross Margin Analysis
(iii) Financial Analysis
(iv) Cobb-Douglas Production Function
(v) Probit Regression Model Analysis
(vi)t-Test Analysis
(vii) Z-Test Analysis

Descriptive Statistics

Descriptive statistics was employed to have summary descriptions of data collected. This include: mean, minimum, and maximum values, frequencies distribution, percentages, and standard-deviation. Descriptive statistics was used to determine the socio-economic characteristics, sources, and amount of loan accessed, and identify the constraints facing smallscale rice farmers in accessing loan. This was used to achieve specific objectives one (i), two (ii), and six (vi)

Gross Margin Analysis

To determine the costs and returns analysis of smallscale rice production in Gwagwalada Area Council, the Gross Margin Model was employed. The gross margin (GM) is the difference between the total revenue (TR) and the total variable cost (TVC). The total revenue was the product of rice quantity (100Kg Bag) and the price of rice per 100Kg bag.
Mathematically, in line with Ben- Chendo *et al.* (2007) and Nwele (2016), the gross margin analysis is stated thus:

GM= TR-TVC----------------- (1)

Where, GM = Gross Margin (Naira)
TR= Total Revenue (Naira)
TVC= Total Variable Cost (Naira)
This will be used to achieve specific objective three (iii)

Financial Analysis

In order to evaluate the strength and financial position of the rice production, operating ratio, and rate of return per Naira invested was considered. An Operating Ratio (OR) according to Olukosi and Erhabor (2005) is status thus:

$$\mathrm{OR} = \frac{\mathrm{TVC}}{\mathrm{GI}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots. (2)$$

Where:
OR= Operating Ratio (Unit)
TVC= Total Variable Cost (Naira)
GI= Gross Income (Naira)
An Operating Ratio that is less than one (1) implies that the total revenue obtained from rice production will be able to pay the cost of variable inputs used in the enterprise (Olukosi and Erhabor 2005). The Rate of Return per Naira Invested (RORI) in rice production is stated thus:

$$\mathrm{RORI} = \frac{\mathrm{NI}}{\mathrm{TC}} \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots.. (3)$$

Where,
RORI= Rate of Return per Naira Investment (Units)
NT= Net Income from Rice Production (Naira)
TC=Total Cost (Naira)
The financial analysis was used to achieve part of specific objective three (iii)

Cobb-Douglas Production Function

Cobb-Douglas Production Function is stated thus:

$$\mathrm{Y} = \mathrm{F}(\mathrm{X}_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, U_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (4)$$

$$\mathrm{LogY} = \beta_0 + \beta_1 LogX_1 + \beta_2 LogX_2 + \beta_3 LogX_3 + \beta_4 LogX_4 + \beta_5 LogX_5 + \beta_6 LogX_6 + \beta_7 LogX_7 + \beta_8 LogX_8 + \beta_9 LogX_9 + U_i \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (5)$$

Where,
Y= Output of Rice (kg)
$\mathrm{X}_1 = \mathrm{Age\ (Years)}$
$\mathrm{X}_2 = \mathrm{Fertilizer}(Naira/kg)$
$\mathrm{X}_3 = \mathrm{Farming\ Experience(Years)}$
$\mathrm{X}_4 = \mathrm{Labour\ Input(Mandays)}$
$\mathrm{X}_5 = \mathrm{Seed\ Input}\left({}^{\mathrm{Naira}}/_{\mathrm{kg}}\right)$

$X_6 = \text{Chemical Input}\left(^{\text{Naira}}/_{\text{Litre}}\right)$
$X_6 = \text{Marital Status}(1, \text{Married}, 0, \text{Otherwise})$
$X_8 = \text{Farm Size}(\text{Hectares})$
$X_9 = \text{Household Size}(\text{Units})$
$U_i = \text{Error Term}$
$\beta_0 = \text{Constant Term}$
$\beta_1 - \beta_8 = \text{Regression Coefficients}$
This was used to achieve specific objective four (iv)

Probit Regression Model Analysis

The Probit Regression Model is stated thus:

$$Y = F(X_1, X_2, X_3, X_4, X_5, X_6, X_7, U_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (6)$$

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + U_i) \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots (7)$$

Where,
Y= Dichotomus Response Variable (1, Access to Loan; 0, Otherwise)
X_1=Age (Years)
X_2= Households Size (Units)
X_3= Level of Education (0, Non-Formal; 1, Primary; 2, Secondary; 3, Tertiary).
X_4= Marital Status (1, Married; 0, Otherwise)
X_5= Farm Size (Hectares)
X_6= Membership of Cooperative Organisations (1, Member; 0, Otherwise)
X_7= Access to Extension Services (1, Access; 0, Otherwise)
U_i= Error Term
β_0= Constant Term
β_1-β_7= Regression Coefficients
This was used to achieve specific objective five (v)

RESULTS and DISCUSSION

Socio-Economic Characteristics of the SmallScale Rice Farmers Loan Beneficiaries or Non-Beneficiaries

Table 1 shows the analysis of the socio-economic characteristics of the sampled smallscale rice farmers. The results revealed that 68% of the farmers were less than 50 years. The mean age of the sampled rice farmers was 43 years. This implies that smallscale rice farmers were mostly young, active and energetic farmers that were in the range of productive age. Majority (83%) of the smallscale farmers were married. This result is consistent with Kuye and Ogiri (2019) who indicated that married respondents are likely to incur more expenditure on family upkeep. About 34% could not access formal education and 66% of the rice farmers had formal education. Educated farmers adopt new innovations and research findings quickly and also understand the guidelines involved in accessing formal loans.

This result is in agreement with Alabi *et al*, (2020a) who reported that education is an important factor that can influence farmers' adoption of new innovations and research findings. About 45% of the smallscale rice farmers had less than 11 years experience in rice farming. The average farming experience of the farmers was 15 years. This finding is in line with Maurice *et al* (2015). Most of the sampled rice farmers had less than 2 hectares of farm size, while 36% of the farmers had between 3-4 hectares of rice farm land. The mean value of the farm size was 2.39 hectares.

This is in line with Kuye and Ogiri (2019) who reported that the sampled farmers in their study were generally smallscale farmers, which fall within the active age of farming productivity with long years of farming experience. The results of sampled smallscale rice farmers shows that most of the farmers had less than 5 hectares of land. This implies and confirms that they are mostly smallscale farmers. The average members per household were 6 people. This is in consonant with findings of Alabi *et al* (2020b) who reported that the rural rice farmers on the average had 7 people in the households. Majority (60%) of the sampled rice farmers were members of cooperative organization, only 22% of the sampled rice farmers had access to loan. More so, because majorities were married with large household size and low annual income they need to gain access to adequate loan facility. Furthermore, sampled farmers accessed loan through formal source while 31% had access to loan through informal sources. Also, 69% of the smalscale rice farmers obtained their capital through their personal savings, while 21% obtained their capital through credit borrowing.

Table1. Socio-Economic Characteristics of the Sampled SmallScale Rice Farmers

Variables	Frequency	Percentage	Mean
Age (Years)			43.07
21-30	11	11.0	
31-40	30	30.0	
41-50	38	38.0	
51 and above	21	21.0	
Sex			
Female	29	29.0	
Male	71	71.0	
Marital Status			
Single	5	5.0	
Married	83	83.0	
Divorced	1	1.0	
Widow/widower	8	8.0	
Separated	3	3.0	
Educational Level			
Non Formal Education	34	34.0	
Primary Education	14	14.0	
Secondary Education	21	21.0	
Tertiary Education	31	31.0	
Farming Experience (Years)			14.61
1 – 10	45	45.0	
11 – 20	35	35.0	
21 and above	20	20.0	
Farm Size (Ha)			2.39
1-2	62	62.0	
3-4	36	36.0	
5 and above	2	2.0	
Household Size (Number)			6.47
1-10	85	85.0	
11-20	15	15.0	
Cooperative Membership			
No	40	40.0	
Yes	60	60.0	
Access to Loan (₦)			
No	78	78.0	
Yes	22	22.0	

Source: Field Survey (2022)

Table1. Socio-Economic Characteristics of the Sampled SmallScale Rice Farmers Continued

Variables	Frequency	Percentage	Mean
Extension Access			
No	12	12.0	
Yes	88	88.0	
Method of Land Acquisition			
Inheritance	46	46.0	
Purchase	30	30.0	
Rent	14	14.0	
Gift	8	8.0	
Lease	2	2.0	
Major Source of Loan			
Formal Sources	62	62.0	
Informal Source	31	31.0	
Major Source of Capital			
Personal Savings	69	69.0	
Credit Borrow	21	21.0	
Friends and Family	3	3.0	
Money Lenders	3	3.0	
None	4	4.0	

Source: Field Survey (2022)

Sources and Amount of Loan Accessed by SmallScale Rice Farmers

The sources and amount of loan accessed by smallscale rice farmers is presented in Table 2. The major sources of loan by farmers were through formal and informal sources. The average loan accessed from formal sources by smallscale rice farmers was ₦200,754.2 with the maximum interest rate of 36% charged.

The minimum and maximum amount accessed from formal sources by smallscale rice farmers were ₦30,000 and N500,000 respectively. The average amount of loan accessed from informal sources by the smallscale rice farmers was ₦129,558.82 with maximum interest rate of 20%, while the minimum and maximum amount of loan accessed by smallscale rice farmers were ₦25,000 and ₦400,000 respectively. This is in line with findings of Kuye and Ogiri (2019) who reported in their study that the average values of loan applied and received were ₦169,583.33 in Cross River State, Nigeria.

This result implies that the formal sources of loan provide capital to smallscale rice farmers at a higher interest rate which makes it difficult for farmers to access the agricultural loan. Since the interest rate of formal source is high and unaffordable, the loan from informal sources are more affordable because their interest rate charged is lower than that of formal sources.

Table 2. Sources and Amount of Loan Accessed by SmallScale Rice Farmers

Sources of Loan	Mean (Naira)	Maximum Interest Rate (%)	Minimum Amount Accessed (Naira)	Maximum Amount Accessed(Naira)
Formal Sources	200,754.72	**36**	30,000	500,000
Commercial Bank		**22**	**-**	**-**
Microfinance Bank		36	-	-
Bank of Agriculture		12.5	-	-
Cooperative Society		10	-	-
Bank of Industry		0	-	-
Government Institutions		7	-	-
Informal Sources	129,558.82	20	25,000	400,000
Money Lenders		10	-	-
Friends		20	-	-
Relatives		10	-	-
Others		-	-	-

Source: Field Survey (2022)

Costs and Returns in SmallScale Rice Production

Table 3 present the results of the gross margin analysis which shows the costs and returns involved in rice production by smallscale farmers. The total variable cost was ₦98, 569.06. This accounted for 56.73% of the total cost of production. The estimated cost of seeds and fertilizer inputs were ₦12.546 and N20.288.66 and they represent 7.22% and 11.68% of total cost of production respectively. The estimated cost of labour was ₦86,.651, this represent 49.87% of the total cost of production. Labour carries the largest share of the total cost of rice production by smallscale farmers.

The total fixed cost was ₦75. 192.851, this accounted for 43.27% of the total cost of rice production. The depreciation on the farm assets was ₦19, 884.791 this accounted for 11.444% of the total cost of rice production. The estimated value of land rent incurred was ₦8, 565 this accounted for 4.93% of the total cost of rice production. The interest rate paid on loan was ₦46, 243.91 and this accounted for 26.613% of the total cost of rice production. The total cost of production estimated was ₦173.761.851. The total revenue realized was ₦375,255, while the gross margin was estimated to be ₦201. 493.149. The net farm income was ₦126,300.

This implies that rice production by smallscale farmers was profitable. The gross margin ratio, operating ratio, and the rate of return on investments were 0.53, 0.489 and 0.727 respectively. The gross margin ratio of 0.534 implies that for every one naira invested in rice production by smallscale rice farmers, 53 kobo covered profits, depreciation, interest and all other expenses in rice production. This result is consistent with Alabi *et al.,* (2020a) who reported that the estimated gross margin ratio, covered the profits, interest, taxes, expenses, operation cost and depreciation on assets.

Table 3. Costs and Returns Involved in Rice Production by Small Scale Rice Farmers

Variable	**Value (N)**	Percentage
(a) Variable Cost		
Seed Input	12,546	7.22
Fertilizer Input	20,288.66	11.68
Chemical Input	13,711	7.89
Labour Input	86,651.66	49.87
Bags/Sacks	4,051.4	2.33
Bagging	2,592	1.49
Loading/Offloading	1,476.5	0.84
Transportation	3,797.5	2.185
Total Variable Cost	98,569.06	56.73
(b) Fixed Cost		
Depreciation on Farm Assets	19,884.791	11.444
Land Rent Incurred	8,565.00	4.93
Interest	46,243.91	26.613
Fess/Commission	500	0.28
Total Fixed Cost	75,192.791	43.27
Total Cost of Production	173,761.851	100
Total Revenue	375,255	
Gross Margin		201,493.149
Net Farm Income		126,300
Gross Margin Ratio		0.534
Operating Ratio		0.489
Rate of Return on Investment		0.727

Source: Field Survey (2022)

Factors Influencing Output of SmallScale Rice Production

Table 4 present the results of the evaluation of the Cobb-Douglass production function model. The variables included in the model were: age, fertilizer input, farming experience, labour input, seed input, chemical input, marital status, farm size, and household size. The statistically and significant factors influencing rice output production were labour input ($P<0.01$), fertilizer input ($P < 0.01$) and chemical input ($P<0.05$). The coefficient of fertilizer input was negative and statistically significant at ($P<0.05$). The coefficient of labour input 0.542 implies that a unit increase in labour input will result in likelihood of 0.542 increases in the output of rice production. The coefficient of the chemical input was 0.682. This implies that a unit increase in the use of chemical input leads to likelihood of 0.682 increases in the output of rice production by the smallscale rice farmers. The coefficient of fertilizer input was -0.514. This implies that a unit increase in the use of fertilizer input by smallscale rice farmers will results in 0.514 decreases in the output of rice production. This result is in line with Alabi *et al* (2020a) who reported that the factors that were positive and significantly influencing agricultural product output include: family labour, hired labour, and volume of pesticides used. The value of the coefficient of the multiple determinations (R^2) was 0.642. This implies that 64% of the variations in the output of rice were explained by the explanatory variables included in the Cobb-Douglass production model. The joint contributions of the explanatory variables ($F = 12.78$) to the variation in the output of rice was statistically significant at ($P < 0.01$) probability level.

Table 4. Factors Influencing Output of Rice (Cobb Douglass Production Model)

Variable	Regression Coefficient.	Std. Err.	t-Value
Age	-0.0739076	0.5494516	-0.13
Fertilizer Input	-0.5136386**	0.1861237	-2.76
Farming Experience	0.1041263	0.1333288	0.78
Labour Input	0.541824***	0.1601303	3.38
Seed Input	-0.0390949	0.4226708	-0.09
Chemical Input	0.6822296**	0.2720754	2.51
Marital status	0.3148554	0.2917829	1.08
Farm Size	0.224502	0.1510091	1.49
Household Size	-0.0202883	0.2625072	-0.08
Constant	3.444572	1.341634	2.57
R-Squared =	0.6424		
F Value = 12.78			
Adj R-Squared = 0.5921			

*Source: Field Survey (2022) ***-Significant at 1 % Probability Level, **-Significant at 5% Probability Level, *-Significant at 10% Probability Level.*

Socio-Economic Factors Influencing Access to Loan by SmallScale Rice Farmers

Table 5 presents the results of the Probit regression model estimates of the socio-economic factors influencing access to loan by the smallscale rice farmers in the study area. The socio-economic variables included in the model were: age, household size, educational level, marital status, farm size, cooperative membership and extension visit. The results show that there were only two (2) of the explanatory variables statistically significant in influencing access to loan by smallscale rice farmers. Thee significant variables were education level ($P<0.10$) and cooperative memberships ($P < 0.05$). The positive values of the magnitude of the coefficients implies that a unit increase in educational level and cooperative memberships of the smallscale rice farmers will result in increase in the likelihood or probability of the smallscale rice farmers to have access to loan. The marginal effect of the education level of 0.055 implies that a unit increase in the level of education of smallscale rice farmers will lead to 0.055 marginal increase in the likelihood or probability of having access to loan by smallscale rice farmers. This is in line with the findings of Ameh & Iheanancho (2017) who reported that educated farmers has courage, boldness and the technical know-how required to approach financial institutions for loan. This also is in conformity with the findings of Asogwa, Abu and Ochoche (2014) who observed that education level raises smallscale farmers' knowledge and level of awareness about the needs for agricultural loan and leads them to seek for agricultural loan facilities for increased output. Likewise, the marginal effect of cooperative memberships 0.207 signifies that a unit increase in the cooperative memberships of smallscale rice farmers leads to 0.207 marginal likelihood or probability of having access to loan by smallscale rice farmers. The maximum likelihood estimates revealed that the Log Likelihood value was -144.796. The Chi Square value was 15.79 and was statistically significant at ($P < 0.01$) probability level. The Pseudo R square value was 0.1498. This implies that 15% of the variations in smallscale farmers access to loan were explained by the explanatory variables included in the Probit regression model.

Table 5. Results of the Estimated Probit Regression Model to Determine Socio-Economic Factors Influencing Access to Loan by SmallScale Rice Farmers

Variables	Coefficient.	Std. Err.	Z-Score	Marginal Effects
Age	0.006391	0.0242966	0.26	0.0016257
Household Size	0.0826468	0.0713751	1.16	0.0210228
Education Level	0.2187915	0.1338788	1.63	0.0556538
Marital Status	0.0459309	0.2200495	0.21	0.0116834
Farm Size	-0.0777221	0.1432863	-0.54	-0.0197701
Coop membership	0.8146234	0.362007	2.25	0.2072148
Extension Visit	0.4917283	0.5799097	0.85	0.1250804
Constant	-3.102106	1.33712	-2.32	
Log Likelihood	-44.796815			
LR $Chi^2(7)$	15.79			
Prob > Chi^2	0.0271			
Pseudo R^2	0.1498			

Source: Field Survey (2022), ***-Significant at 1 % Probability Level, **-Significant at 5% Probability Level, *-Significant at 10% Probability Level.

Constraints Encountered by Smallscale Rice Farmers in Accessing Loan in the Study Area

Table 6 presents the results of the constraints encountered by sampled smallscale rice farmers in accessing loans. The results show that 23% of the sampled respondents were faced by challenge of the lack of collateral securities for accessing the loan, while 38% encountered cumbersome administration procedures which could be a due to illicit behaviour of those involved in processing the loans. About 39% of the sampled smallscale farmers were faced with the challenge of high interest rate charged by the banks and the financial institutions. Furthermore, 40% of the sampled smallscale rice farmers encountered the constraint of long distance to financial institutions since most of the farmers are leaving in rural and remote areas, they may find it difficult to transport due to bad road infrastructures and how to locate the financial institutions which are mostly located in the urban areas and capital cities. This is in line with Ajah, Igiri and Ekpenyong (2017) who opined that the distance between home of farmers and source of credit affects the farmers from accessing loan because the borrower's home is far away from the source of credit. Also 22% and 20% of the sampled smallscale rice farmers encountered late disbursement of loan and the small amount of loan given to farmers as loan as their major challenge for accessing loan. This result is in line with Kuye and Ogiri (2019) who asserted that the major constraints for accessing loan by farmers are long period of processing loan applications. The long period of processing loan application always results in late disbursement of loan with concomitant effect of loan diversion and default. More so, 34% of the respondents expressed that short re-payment period are their major constraint for accessing loan. The implications of this could be because crop farming is a seasonal business which could take a period between 3-6 months before harvesting, crop output is very cheap at the time of harvest, when they are given short period of time for repayment of loans, they may not be able to cover all their expenses when they are forced to sell their crops for the purpose of paying the borrowed funds.

Table 6. Results of the Analysis of the Constraints Encountered by the Smallscale Rice Farmers

Variables	Frequency	Percentage	Rank
Lack of Collateral	23	23.0	5
Cumbersome Administrative Procedures	38	38.0	3rd
High Interest Rate	39	39.0	2nd
Long Distant to Financial Institutions	40	40.0	1st
Late Disbursement of Loan	22	22.0	6
Small Amount of Loan	20	20.0	7
Short Re-Payment Period	34	34.0	4th
Fragment of Loan Facilities	32	2.0	8
Others	1	1.0	9
Total	**100**	**100**	

Source: Field Survey (2022)

CONCLUSION

The study concludes that the rice production activities were profitable in the study area. Most of the smallscale rice farmers are male, and were married. Rice farmers were young energetic within the productive age. Most of the smallscale rice farmers could not have access to loan from formal sources because of high interest rate. Majority of the farmers had their capital through their personal savings, while few farmers acquired their capital through credit borrow. The study shows that rice production is a profitable enterprise in the study area. The statistically and significant factors influencing rice output production include labour input, chemical input, and fertilizer input. The significant socio-economic factors influencing access to loan by smallscale rice farmers were education level and cooperative memberships. The constraints faced by smallscale rice farmers in accessing loan were: long distance to financial institutions, high interest, cumbersome administrative procedures, short re-payment period, lack of collateral securities and small amount of loan.

RECOMMENDATIONS

Based on the findings of this study the following policy recommendations were made

(i) Policies towards provision of formal sources of loan to smallscale farmers should be implemented and encouraged. Loans should be made available to farmers by all financial institutions at affordable interest rate preferably single digit.

(ii) Provision should be made for farmers to have access to tractors farm machineries and other farm inputs. This will help them to overcome and elevate the problem of labour which is costly. Special consideration should be given to smallscale rice farmers in order to encourage them to upgrade and involve in large scale rice production to be able to fill the high demand and supply gap of rice in the Nigeria.

(iii) Policies that will reduce the cost of production of smallscale rice farmers should be implemented. Costly productive inputs and chemical and other farm inputs should be subsidized and made readily available.

(iv) The education of farmers should be given serious priority, training should be organised through extension agents in order for them to know the guidelines involved in accessing loans and monitoring team should be set up for proper accountability.

More farmers should also be encouraged to join cooperative organisations because aid their accessibility to loan disbursement, since government and non-governmental organisation prefer to deal with organised groups of farmers than individuals

(v) The cumbersome administrative procedures involved in accessing loan which serve as a bottle neck in accessing loan by farmers should be addressed. Government should make provisions for special agricultural microfinance banks that will be located in rural areas to meet the need of farmers' loan demand. This equally necessitate the development of rural areas as banks will not be able to function well where basic amenities are lacking.

REFERENCES

Adegbite D. A,, Momoh S. & Alade A. 2007. Determinants of Savings Mobilization in Ogun State, Nigeria. *Journal of Sustainable Development;* 4 (1 & 2), Pp. 43 –48

Ajah E. A,, Igiri J. A. & Ekpenyong B. 2017. Determinants of Access to Credit Among Rice Farmers in Biase local Government Area of Cross River State, *Nigeria Global Journal of Agricultural Sciences*, vol. 16, 2017: 43-51

Akpokodje G,, Lançon F. & Erenstein O. 2001. Nigeria's Rice Economy: State of the Art in NISER/WARDA Nigerian Rice Economy Stakeholders Workshop, Ibadan, 8-9.

Alabi O. O,, Oladele A. O. & Oladele N. O. 2020a. Economic Market Decisions Among Marginal Maize Farmers in Abuja, Nigeria: Applications of Double Hurdle Model and Factor Analysis *Russian Journal of Agricultural Sciences,* 8(104), August 2020 114 doi:10.18551/rjoas.2020-08.14

Alabi O. O,, Oladele A. O. & Oladele N. O. 2020b. socio-economic Factors Influencing Perceptions and Adaptability of Rural Rice Farmers to Climate change, Abuja, Nigeria: Applications of Heckman two-Stage Model. *Russian Journal of Agricultural Sciences*, 8(104), August 2020 45, doi:10.18551/rjoas.2020- 08.06

Alabi O. O,, Oladele A. O. & Usman M. B. 2021. Determinants of Agricultural Loan Decision Making Process for Rice (Oryza Sativa) Farmers in Abuja, Nigeria. Applications of Heckman Two-Stage Model and Factor Analysis, *Journal of Agribusiness and Rural Development* 1(59) 2021, 29–38

Ameh M. & Iheanancho A. C. 2017. Socio-Economic Factors Influencing Agricultural Loan Acquisition Among Small-Scale Rice Farmers in Benue State, Nigeria. *International Journal of Innovative Agriculture & Biology Research* 5(4):8-17, Oct.-Dec., 2017

Asogwa B.C,, Abu O. & Ochoche G.E. 2014. Analysis of Peasant Farmers' Access to Agricultural Credit in Benue State, Nigeria. *European Journal of Economics, Management & Trade*, 4(10): 1525-1543.

Balogun O. 2006. The Federal Capital Territory of Nigeria: A Geography of Its Development University of Ibadan press Limited.

Ben-chendo G.N,, Lawal N. & Osuji M.N. 2017. Cost and Returns Paddy Rice Production in Kaduna State. *European Journal of Agriculture and Forestry Research* 5(3):41-48

EFLnA (Enhancing Financial Innovation and Access)., 2008. Access to financial services in Nigeria: Ileyfridingi

FAO 2001. Food and Agricultural Organization. "Workshop on Policy Support for Rapid Adoption of Hybrid Rice on Large Scale Production in Asia" Hanoi; Vietnam, final Report.:10

International Food Policy Research Institute 2008. *Agricultural Public Spending in Nigeria*, evelopment Strategy and Governance Division.IFPRI Discussion paper 00789. September

Kagan J. 2019. Banking: Loan Basics. Investopedia.www.investopedia.com/terms/l/loan.asp

Kuye O. O. & Ogiri Oyom M. 2019. Analysis of Factors Influencing Access to Formal Loan Among Small- scale Swamp Rice Farmers in Obubra Local Government Area, Cross River State, Nigeria. *International Journal of Agricultural Economics.* Vol. 4, No. 6). 307-313.

Kuye O. O. & Ogiri O. M. 2019. Analysis of Factors Influencing Access to Formal Loan Among Small-Scale Swamp Rice Farmers in Obubra Local Government Area, Cross River State, Nigeria. *International Journal of Agricultural Economics*. Vol. 4, No. 6, 2019, pp. 307-313. doi:10.11648/j.ijae.20190406.19

Maurice C,, Adamu Y. & Joseph M. 2015. Analysis of Cost Efficiency in Food Crop Production Among Small-Scale Farmers in Adamawa State, Nigeria. *Global Journal of Agricultural Science*s Vol. 14, 2015: 17-25

NPC 2006. National Population Commission of Nigeria, Sample Survey.

Obisesan A. 2013. Credit Accessibility and Poverty among small holder cassava farming households in south west Nigeria, Greener Journal of Agricultural Science. 3(2): 120–127.

Odoemenem I. U. & Obinne C. P. O. 2010. Accessing the Factor Influencing the utilization of Improved cereal crop production technologies by small farmers in Nigeria.

Odoemenem U. I. & Inakwu J. A. 2011. Economic analysis of rice production in Cross River State. *Journal*