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308 Lasani Town, Sargodha Road, Faisalabad - Pakistan
Mob: +92 300 3008585, Fax: +92 41 8815544
E-mail: editorijps@gmail.com

Analysis of Agricultural Loan Use Decision among Poultry Farmers in Oyo State, Nigeria

Otunaiya A.O., O.A.C Ologbon and E.O. Akerele

Department of Agricultural Economics and Farm Management, College of Agricultural Sciences, Olabisi Onabanjo University, Yewa Campus, P.M.B 012, Ayetoro, Ogun State, Nigeria

Abstract: This study examined the use of agricultural loan among poultry farmers in Lagelu Local Government Area of Oyo state, Nigeria. The study was based on primary data obtained in a cross-section survey of 107 respondents drawn by multi-stage random sampling technique. The study data was analyzed by both descriptive and quantitative techniques. The study revealed that majority of the respondents is still in their active age, though, 88.8% of the poultry farmers are males. Almost all the respondents were married and educated. The result of the logit regression model specified revealed that factors such as gender, household size, amount of credit available, main occupation of the farmer and access to extension agents are the determinants of poultry farmers' decision to use credit. The analysis of determinants of volume of loan poultry farmers use, using Tobit regression, reveals that factors such as net farm income, market source and gender of the farmers are significant. The study, therefore, recommends that discriminating interest rate that will be female friendly should be introduced by agricultural loan provider to enhance female poultry farmers' decision for agricultural loans.

Key words: Agricultural loan, poultry farmers, Logit, Tobit and Nigeria

INTRODUCTION

Agriculture in Nigeria can be observed to be characterized by the peasant farmers, they produce 95% of the total production in agriculture. Nigerian agriculture is characterized by low farm income, low level of capacity to satisfy the food and fibre needs of the country (Otunaiya, 2012). Consequently, Nigeria still manifests the typical symptoms of peasant agriculture and that the result of this is low productivity in virtually all the sub-sectors of agriculture (Mahmood *et al.*, 2007).

Poultry is about 58.72 percent of the total livestock production in Nigeria which indicates the place of poultry sub sectors in the livestock industry. Poultry meat and eggs play a very useful role, not only in providing income to the farmers but more importantly, in bridging the protein gap in Nigeria. These important roles played by poultry production make imperative the need for financial assistance for poultry farmers in order to raise their production level.

Efforts to deliver formal credit and financial services to the rural poor in developing countries have failed over the years (Adams, 2009; Otunaiya, 2007). Commercial banks generally do not serve the needs of the rural poor because of the perceived high risk and the high transaction costs associated with loans and saving deposits. To fill the void, many governments have tried to deliver formal credit to rural areas by setting up special agricultural banks or directing commercial

banks to loan to rural borrowers. Despite government initiatives, agricultural credit still seems insufficient. This insufficiency is due to several problems on the side of the financial institution which could be as a result of supervision insufficiency, political interference, etc (Abedullah, 2009). Moreso, these programs have almost failed because of political difficulty for governments to enforce loan repayment and often time the relatively wealthy farmers have better access to loan than the poor farmers (Adams, 2009). Other problem includes increase in default rates of agricultural loans which have made the sector non viable as it gives a negative margin (NBS, 1996). High default rates were identified as a major reason which makes banks reluctant to give loans to farmers (Akinwunmi, 1988). The study further explained that problems arose from the inability of the credit institution to distinguish lending for urban projects and small scale farming.

However, Agricultural loan remain a critical means through many problems confronting poultry farmers can be resolved. Primarily, it assists in breaking the chains of the vicious circles of poverty which is the main cause of low productivity and low income of the poultry farmers (Bamiro *et al.*, 2012). Unfortunately, the level of credit available to these farmers is grossly inadequate and therefore, limits the realization of their full potentials. Access to formal financial services by the majority of the poultry farmers is highly limited. The formal financial

system provides services to about 35% of the economically active population while the remaining 65% are excluded from access to financial services (Central Bank of Nigeria, 2005). These 65% are often served by the informal sector, through NGO-MFIs, friends, relatives, cooperative societies and credit unions. This financial gap has been partly attributed to the inadequacy in the distribution of formal institutions. Furthermore, there are indications of problems relating to timing, conditions and size where loans are made available to the farmers (Otunaiya, 2007). All these previous studies and many other studies on agricultural credit, such as (Kulwant, 1996; Adebayo and Adeola, 2008; Abedullah *et al.*, 2009; Adesiji *et al.*, 2011 and Yasir *et al.*, 2012), examined different problems associated with agricultural loans but failed to critically examine the role of socio-economic characteristics of farmers and farm characteristics in acquisition and utilization of the loan. If poultry farmers need agricultural loan to overcome their production problems, then questions arise such as:

- What are the socio-economic characteristics of poultry farmers?
- What are the characteristics of agricultural loan in the study area?
- What are the determinants of loan acquisition in the study area?
- What are the factors affecting the loan utilization by poultry farmers?

This paper, therefore, analyze the use of agricultural loan among poultry farmers in Lagelu Local Government Area of Oyo state, Nigeria. Specifically, the study describe the socio-economic characteristics of poultry farmers; examine the characteristics of agricultural loan in the study area; identify the determinants of loan acquisition among poultry farmers; and examine the factors affecting the volume of loan utilized by poultry farmers.

MATERIALS AND METHODS

The study was carried out in Lagelu local government areas of Oyo state. Lagelu Local Government is one of the 33 Local Government Areas in Oyo state. The Local Government covers a total area of 416 square kilometers. The residents are predominantly part-time and full-time farmers. The local government area was chosen for the study because of large number of poultry farms in the area.

The study basically used primary data which was collected through a set of well structured questionnaires. Though, secondary data was also obtained from journals, previous researches, reports, textbooks, internet and relevant publications to support the study. To ensure even distribution of the sample for the study, a multistage sampling technique was used in selecting

small scale poultry farmers within the study area. firstly, 10 villages were randomly selected from the list of 80 villages identified in the Local Government Area. At the second stage, 12 poultry farmers were selected at random from each village, giving a total of 120 respondents. Thirteen responses were expunged for being out-liars.

A combination of analytical tools was employed for the purpose of achieving the objectives of the study. These include descriptive statistics, Logit and Tobit regression models. Descriptive statistics was used to describe the socio-economic variables in the study. However, Agricultural loan use by the sampled poultry farmers was analyzed as a two-stage decision problem: decision on whether to use or not to use agricultural loan; and decision on the amount or volume of agricultural loan to use. The first stage problem was analyzed by specifying and estimating a Logit model of agricultural loan use, while the second stage problem was analyzed by specifying and estimating a Tobit model of extent of loan use by poultry farmers.

The logit regression model was employed to identify the determinants of agricultural loan acquisition. The model is specified in implicit form as:

$$Y_i = \log \frac{P_i}{1-P_i} = \beta_0 + \beta_1 X_i + \varepsilon_i \quad (1)$$

- Y_i = Credit use decision of *i*th poultry farmer (1 = if acquired credit, 0 = if otherwise)
- X_1 = Age (years)
- X_2 = Gender (1 = male, 0 = female)
- X_3 = Household size (number)
- X_4 = Educational level (years)
- X_5 = Source of credit?
- X_6 = Non Farm Income
- X_7 = Net Farm Income
- X_8 = Amount of loan available
- X_9 = Main Occupation (1 = farming, 0 = other wise)
- X_{10} = Numbers of dependants
- X_{11} = Market source
- X_{12} = Credit use experience (years)
- X_{13} = Extension service (No of visit)
- U_i = Error term

The Tobit Regression Model (Eq. 2) was used to examine the factors affecting the quantity of loan utilized by poultry farmers. Following from McDonald and Moffit (1980) as adapted by Adesina and Baidu-Forson (1995) and Adesina (1996), the model is expressed as:

$$Y_i = \beta_0 + \beta_i X_i + \varepsilon_i \quad (2)$$

Where:

- Y_i = Probability of adequate loan or volume of loan
- Y_i = is continuous if $Y_i \geq Y_0$
- Y_i = 0 if $Y_i \leq Y_0$
- Y_0 = The non-observable threshold level

- X_i = Vector of explanatory variables
- β_i = Vector of respective parameters
- ϵ_i = Independently distributed error term
- Y = Volume of financing/funding (Naira)
- X_1 = Age (yrs)
- X_2 = Educational Status (yrs)
- X_3 = Poultry Keeping Experience (Years)
- X_4 = Household Size (No)
- X_5 = Interest rate (%)
- X_6 = Number of Birds (No)
- X_7 = Total annual expenditure
- X_8 = Net farm income
- X_9 = Amount of credit
- X_{10} = Main occupation
- X_{11} = Dependence ratio
- X_{12} = Market Source
- X_{13} = Credit use experience
- X_{14} = Source of credit
- X_{15} = Extension services
- X_{16} = Gender
- U_1 = Error term

RESULTS AND DISCUSSION

Results of socio-economic characteristics of farmers:

The socio-economic characteristics of the poultry egg farmers in the study area are presented in Table 1. In traditional poultry production system the age of the

Table 1: Socio-economic characteristics of the sampled poultry farmers

Age-grouped	Frequency	(%)
Below 30 years	1	0.9
31-40 years	34	31.8
41-50 years	48	44.9
51-60 years	24	22.4
Sex		
Male	95	88.8
Female	12	11.2
Marital status		
Single	1	0.9
Married	97	90.7
Widow	1	0.9
Separated	8	7.5
Education		
Primary	11	10.3
Secondary	53	49.5
Tertiary	36	33.6
No formal education	7	6.5
Family size		
1-3	34	31.8
4-6	54	50.5
7-9	13	12.1
10-12	6	5.6
Farming experienced		
Below 5 years	32	29.9
6-10 years	36	33.6
11-15 years	31	29.0
16-20 years	6	5.6
Above 20 years	2	1.9
Total	107	100

farmers is an important factor that affects the productivity and production. This is more apparent in the poultry farm where the owner is the farm manager. This is because most of the activities in the farm are done manually. The physical ability of a man obeys the law of diminishing returns. In this wise, the productivity of man increases with age to a peak level after which it declines as the farmer advances in age. The willingness to try and adopt new innovations also tends to follow similar trend. Therefore, the older the farmer becomes, the higher the risk averse tendency because the farmer's goal tends to shift from profitability to security. The Table 1 reveals that 44.9% of the poultry farmers which constitutes the majority of the respondents are between the age range 41-50 years, 31.8% are between 31-40 years, 22.4% are between 51-60 years while only 0.9% are below 30 years. This implies that most of the poultry farmers, in the study area, are matured to take credit decision that can sustain their poultry production.

Analysis of gender of poultry farmers in the study area, as shown in Table 1, shows that 88.8% represents the male poultry farmers while only 11.2% represents the female poultry farmers. The result indicates clearly that the male respondents who engage in poultry farming are more than the female respondents. The result further reveals that 90.7% of the respondents are married, 0.9% are single or widow while 7.5% are separated.

Education is one of the major socio-economic factors that have great impact on the output and productivity of the farmers. Farmers with formal education are privileged to have early contact with new innovations and improved technologies which are designed to improve output and productivity. Moreover, such farmers are early adopters and because risk aversion tendency reduces with formal education. In poultry industry formal education affords farmers especially, those that have training in agriculture, the opportunity to understand proper management of resources in poultry production. The study reveals that majority (49.5%) of the respondents have secondary education, 10.3% have primary education while 33.6% are those having tertiary education and 6.5% of the sampled farmer had no formal education. The result indicate that majority of the poultry farmers are highly educated, thus, expected to enhance the management of poultry farms in the study area. Result in table 1 also shows that majority of the respondents (50.5%) to have family size of 4-6 members. 31.8% with 1-3 members while only 12.1% are with 7-9 family members.

The number of years in which the farm owners or managers have been involved in poultry production could be used to measure the farmer's experience in poultry farming. Experience is expected to have a significant positive impact on the managerial ability of the farmer or farm manager. Therefore, the more

experienced a poultry farmer is, ceteris paribus, the more efficient he would be in farm management because the acquired experience over the years would be brought to bear on the production activities. Table 1 show that poultry farmers having 6-10 years farming experience constitutes majority (33.6%) of the respondents, 36.5% of the farmers had more than ten years of farming experience. This implies that majority of the poultry farmers have fairly long years of farming experience

Characteristics of agricultural loan in the study area:

The features of loan available to farmers can determine its acquisition or otherwise of such loan by farmers. The study examines the characteristics of agricultural loans available to the sampled farmers. The result is presented in Table 2.

The result in Table 2 above reveals that majority of the respondents (64.2%) were of the opinion that the agricultural loan sources are not demanding for high interest. But 77.5% of the respondents claimed that the conditions attached to agricultural loans are not flexible, while 58.3% of the farmers identified poor timing of loan release as a major characteristic of agricultural loan. Majority (46.7%) of the farmers obtained loan from cooperative societies. Medium term loan, with duration range from 1-2 years is the major form of loan that is available to about 53.3% of the poultry farmers in the study area.

Determinants of loan acquisition by poultry farmers:

Results in Table 3, shows that 5 out of the 13 variables in the logit model have significant coefficients. These include gender, household size, amount of credit, main occupation and access to extension agents.

The coefficients of the Age (X_1) Education level (X_4), Source of Credit (X_5), Non farm income (X_6), Net farm income (X_7) and Number of dependence (X_{10}) variables were not significant in this study. This implies that age, education level, source of credit, amount of non farm income, net farm income and number of dependence of the poultry farmer do not affect the decision on the likelihood of the use of agricultural credit in the study area. The Gender of the farmer represented by the coefficient of variable X_2 is positively signed and significant at 10 percent level. This result, as indicated by the marginal effect, shows that a male farmer has about 89 percent likelihood to acquire an agricultural loan to finance a poultry business than a female farmer. The variable, X_3 representing the farmers' household size has negative sign but significant. This is in conformity with the a priori expectations that the poultry farmers who have large household size are not more likely to use agricultural loan. The marginal analysis shows that the likelihood of a poultry farmer to obtain

Table 2: Showing the characteristics of agricultural loan available for the farmers

Variable	Frequency	(%)
High interest rate by the creditors		
Yes	38	35.8
No	69	64.2
Flex loan service		
Yes	22	22.5
No	85	77.5
Timely loan service		
Yes	45	41.7
No	62	58.3
Source of loan		
Micro finance	13	14.2
Relatives & Friends	20	20.8
Money lender	18	18.3
Cooperative society	52	46.7
What form of loan is available to poultry farmers		
Short term loan less than a year	09	10.0
Medium term loan 1-2yrs	64	57.5
Long term loan 3yrs and above	34	32.5
What form of loan did you apply for		
Short term loan	25	23.3
Medium term	63	53.3
Long term	23	23.3
Total	107	100.0

Table 3: Logit regression model of decision to use credit by poultry farmers

Variable	Parameters	Marginal effect	t-value
Constant	-0.1306	-0.5326	-0.225
Age (X_1)	0.7546	0.3077	0.323
Gender (X_2)	0.2195*	0.8953	1.706
Household size (X_3)	-0.8579***	0.3499	3.659
Education level (X_4)	0.2328	0.9494	1.077
Source of Credit (X_5)	0.7332	0.2990	0.383
Non farm income (X_6)	0.1976	-0.8059	0.885
Net farm income (X_7)	-0.4489	-0.1831	-0.302
Amount of credit (X_8)	0.2861**	0.1166	1.996
Main occupation (X_9)	-0.3200**	-0.1305	-2.015
Number of dependence (X_{10})	0.8092	0.3300	0.656
Market Source (X_{11})	-0.3321	-0.1354	-0.565
Credit use experience (X_{12})	-1.3137	-0.5357	-1.325
Extension service (X_{13})	-1.9316***	-0.7877	-3.189
Sigma	2619.72		
Log likelihood function	-1486.36		

***, ** and *denotes the associated coefficients is significant at 1, 5 and 10% levels, respectively

agricultural loan will reduce by about 35 percent if the household size increases by 1 percent.

The effects of the amount of loan available to the poultry farmer (X_8) variable on the decision to acquire agricultural credit closely conformed to a priori expectations. The positive coefficient of the parameter estimates for variable X_8 indicates that the more the volume of loanable agricultural credit facilities are provided, the more the likelihood of a decision by poultry farmer to access it. The marginal effect shows that a percentage increase in the volume of loan available to poultry farmers will increase the likelihood of decision to acquire loan by about 12 percent.

The negative signs of the coefficients representing poultry farmer's main occupation and contact with extension agents indicate contrary results to a priori expectations. As indicated by Table 3, a full-time farmer's likelihood to decide for agricultural loan is about 13 percent lower than that of a part-time farmer. Similarly, a poultry farmer with more extension contacts are (about 79 percent) less likely to use agricultural loan. This high percentage is as a result of extension training and linkage to other farm input supply sources.

Factors affecting the volume of loan utilized by poultry farmers: The influence of socio-economic factors on the volume of loan obtained by poultry farmers was examined by specifying and estimating a Tobit regression technique. Table 4 shows the parameter estimates and diagnostic statistics of the Tobit regression model, including the log likelihood estimates, the predicted probability of quantity of loan used in the sample and marginal changes associated with each coefficient. Many of the estimated coefficients in the Tobit model indicated the expected signs. Moreover, five out of the sixteen variables included in the model are significant.

The result of the Tobit analysis presented in Table 4 above shows that interest rate, number of birds, net farm income, market source and gender of the farmers are the variables that had effect on the volume of loan poultry farmers utilized.

The result shows that the coefficient for variable X_5 was negative and significant at the 1 percent level. This is in accordance to the a priori expectation that as the interest rate increases the volume of loan demanded by farmers' decreases. Interest rate (X_5), therefore, is negatively associated (-0.0463) with the amount of loan use in poultry production. The marginal effect showed that a naira increase in the interest rate of agricultural loan in the study area will decrease the amount of loan demanded by N0.04.

The coefficient measuring the farm size, as indicated by the number of birds on farm (X_6) is positively signed and significant ($p < 0.05$). The marginal effect showed that one additional bird on the poultry farm will increase the amount of agricultural loan use by N0.28k. Likewise, the net farm income of poultry farms (X_8) was found to have positive influence on the amount of loan used by the poultry farmers. Specifically, the net farm income will increase the amount of agricultural loan use by N1.08k. The market source, through which poultry farmers can readily sell their farm output, is a significant factor influencing the amount of agricultural loan use by farmers and the estimated coefficient was statistically significant at the 10 percent level. According to empirical estimate, a ready market source will increase the amount of loan use by N0.17k. Also, the gender of poultry farmers (X_{16}) showed positive and statistically

Table 4: Tobit regression model of factors affecting loan utilization by poultry farmers

Variable	Parameters	Marginal effect	t-value
Constant	0.1188	0.1037	0.225
Age (X_1)	-0.0159	-0.0139	-0.801
Education (X_2)	-0.0014	0.0012	0.740
Poultry keeping experience (X_3)	-0.0549	0.0479	0.738
Household size (X_4)	0.0008	0.0007	0.012
Interest rate (X_5)	-0.0463***	0.0404	3.534
Number of birds (X_6)	0.3206**	0.2798	1.975
Total annual expenditure (X_7)	-0.5418	-0.4729	-1.521
Net farm income (X_8)	1.2412**	1.0833	2.186
Amount of credit (X_9)	0.3821	0.3335	1.087
Main occupation (X_{10})	-0.5212	-0.0454	-0.285
Dependency ratio (X_{11})	-0.3347	-0.2921	-1.556
Market source (X_{12})	0.1919*	0.1675	1.925
Credit use experience (X_{13})	0.6213	0.0542	0.500
Source of credit (X_{14})	0.9890	0.0863	0.842
Extension services (X_{15})	-0.1173	-0.1024	-1.191
Gender (X_{16})	0.2557***	0.2232	3.086
Sigma	2619.72		
Log likelihood function	-1486.36		

***, ** and *denotes the associated coefficients is significant at 1, 5 and 10% levels, respectively

significant ($p < 0.01$) relationship with the amount of agricultural loan used. The marginal analysis further shows that male poultry farmers use more agricultural loan than their female counterpart.

Conclusion and recommendations: Agricultural loan is adjudged as an important input to increase poultry production. The study shows that certain factors responsible for the decision to obtain or otherwise agricultural loan from any source. These factors include gender, household size, amount of credit available, main occupation of the farmer and access to extension agents. However, when a farmer decides to obtain a loan, it is also important for the farmer to decide on the volume of loan that may be required for the poultry farm activities. The Tobit results reveal that factors such as net farm income, market source and gender of the farmers determine the amount of loan poultry farmers use. Base on the forgoing the study recommends the following:

- Discriminating interest rate that will be female friendly should be introduced by agricultural loan provider to encourage female poultry farmers to obtain loans
- Family planning campaign should be intensified among poultry farming household through extension agents and rural health workers
- Extension services should be improved upon and supported by the Government
- Government should endeavor to assure poultry farmers of the market source to dispose their excess farm outputs. This can be achieved if Government provides storage facilities for farmers at affordable cost

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