

An analysis of factors influencing access to credit by poultry egg farmers in Southwestern, Nigeria

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Target Audience: Poultry producers and Policy makers.

Abstract

Poultry occupies a pivotal position because of its enormous potential to bring about rapid economic growth. Agricultural credit is considered essential to the process of improving agriculture and transformation of the rural economy. This study was conducted among 343 poultry egg farmers in Southwestern, Nigeria. Multi-stage sampling procedure was employed was employed in selecting the poultry egg farmers in the study area while descriptive statistics and binary logit were used to analyze the data. The findings of the study revealed that majority (74.3%) of the poultry egg farmers were male with an average age 42 ± 8.9 years. More than half (57.8%) of the farmers were educated above secondary education. More than half (63.6%) of the farmers had between 5-10 years of layers rearing experience with the mean years of experience being 9.0 ± 5.4 years. Majority (98.0%) of the poultry egg farmers had access to credit while only (2%) of the farmers insured their poultry farms. Factors that influenced the poultry farmers' access to credit include gender, years of education, stock size and biosecurity level. The study recommends that the government should formulate a policy that will be assisting the poultry farmers to get more funds at the lowest rate of interest.

Key words: Poultry, Egg, Credit, Logit, Nigeria

Description of Problem

Livestock production in Nigeria includes cattle, sheep, goats, pigs, and poultry [1]. Evidence from the Central Bank of Nigeria [2] in 2012 shows that livestock subsector is the second largest agricultural sub-sector of the Nigerian economy contributing about 0.5% to Nigeria's gross domestic product (GDP). According to the Federal Department of Livestock [3], livestock estimates in Nigeria as at 2009 stood at 7.18 million pigs, 16.43 million cattle, 34.69 million sheep, 55.15 million goats and 183.16 million poultry.

These estimates revealed that poultry is the most commonly kept livestock in Nigeria.

Nigerian poultry population is estimated to be 137.6 million, with backyard poultry population constituting 84% (115.8 million) and 16% (21.7 million) of exotic poultry [4]. The distribution of chicken population in Nigeria revealed that 84.5% of local chickens are found in the Northern parts of the country. On the other hand, 83% of exotic breeds are found in southern part of the country [5].

The poultry industry plays important roles in the development of Nigeria economy. The

industry provides employment opportunities for both skilled and unskilled labour, thereby serving as a source of income to the people. It provides a good source of animal protein in terms of meat (chicken) and eggs [6]. The most widely accepted meat in Nigeria is chicken because of its high-quality protein. Unlike beef or pork, it does not have any religious or health taboo. Also, eggs are a very good source of vitamin A, iron and zinc, which are essential for health, growth and well-being; egg is a complete protein with excellent quality [1; 7].

In Nigeria, poultry enterprise is among the agribusiness sub-sectors that require additional financing apart from the farmer's own investment fund because it is capital intensive. Unfortunately, majority of small scale farmers including poultry, in Nigeria have low income and savings capacity [8]. As a result, most of them find it difficult to adopt modern technology that would have led to increase in their farm incomes [9]. Modern poultry production requires the application of modern technology in the management of the poultry businesses. Agricultural credit is widely recognized as one of the intermediary factors between adoptions of farm technologies and increase of farm incomes among poor farmers in Nigeria [10; 11; 12]. Agricultural credits are loans extended to farmers for production, storage, processing and marketing of farm products. It is one of the fundamental ingredients of sustainable agricultural production, as such, its accessibility and demand is among the prerequisites for attaining the national goal of reducing poverty and ensuring self-food sufficiency goal in the country [12].

Credit supply to farmers is widely perceived as an effective strategy for enhancing the increase in agricultural productivity [13]. Agricultural credit is considered essential to the process of improving agriculture and transformation of

the rural economy. According to [14], the introduction of easy and cheap credit is the quickest way for boosting agricultural production. The argument is that the agricultural sector depends more on credit than any other sector of the economy because of the seasonal variations in the farmers' returns and credit requirement in the transformation of subsistence to commercial farming. Credit provides the opportunity for them to earn more money and improve on their standard of living [14]. The importance of the availability of agricultural credit is evident by the fact that the mean input expenditures per hectare were found to be significantly higher for farmers with credit irrespective of their wealth status [15].

The major objective of this study is to determine the factors influencing access to credit by poultry farmers in the study area. This will help to guide the policy makers in the formulation of policy to improve farmers' access to credit in the agricultural sector.

Materials and Methods

Study area: The study was carried out in Southwest, Nigeria where the bulk of commercial poultry production system with moderate to high bio-security systems is based. It is estimated that over 65% of Nigeria's commercial poultry is located in the Southwest states; while another 25 % is based in the South-south and South-east geo-political zones. The balance of 10% or less of Nigeria's commercial poultry is based in the North-central, North-west and North-east states (3). However, Oyo, Osun and Ogun States were selected as the available records [16] show that the three states have the highest chicken population in Southwest, Nigeria.

Osun State has 30 Local Government Areas with an estimated population of 3.4 million (16) and land area of 14,875 km² on latitude 5⁰N and 8⁰N; between longitude 4⁰E

and 5⁰E. The climate is humid tropical type with a mean annual temperature of about 28⁰C and a mean annual rainfall of over 1600 mm. Oyo State has 33 Local Government Areas with an estimated population of 5.6 million [17]. The land area is 35,743 km² located within latitude 3⁰N and 5⁰N; between longitude 7⁰E and 9.3⁰E. The average temperatures are between 24⁰C and 25⁰C. Rainfall figures over the state vary from an average of 1200 mm at the onset of heavy rains to 1800 mm at its peak in the southern part of the state to an average 800 mm and 1500 mm at the northern part of the state. Ogun State has twenty Local Government Areas bordered to the east by Ondo State and to the north by Oyo and Osun states. Its border with the Republic of Benin to the west makes it an access route to the expansive market of the Economic Community of West Africa States (ECOWAS); and it is bordered to the south by Lagos State and by the Atlantic Ocean. The state covers about 16,762 square kilometer which is approximately 1.81 percent of Nigeria's land mass of about 923,768 and population of 3.8 million [17]. The mean annual rainfall and temperature are about 1,270 mm and 28⁰C respectively while the estimated mean annual potential evaporation is 1,100 mm.

Source and type of data: Primary data were used for this study. The primary data were obtained with the aid of well-structured questionnaire that captured socio-economic characteristics of poultry egg farmers and farm characteristics and other production inputs data. These include age of the poultry egg farmer, gender, level of education, layer rearing experience, household size, access to livestock insurance and sources of credit.

Data collection and sampling techniques: A multistage sampling technique was employed in selecting the poultry egg farmers in the study

area. The first stage was the purposive selection of Ogun, Osun and Oyo States from the six states in Southwest, Nigeria; based on the highest exotic-chicken layers population distribution in Southwest, Nigeria [16]. The second stage involved the purposive selection of five (5) local government areas (LGAs) from Ogun State and four (4) local governments from Osun State and six (6) local governments from Oyo State. The size of the local governments chosen from each state was based on available records of number of registered members of the Poultry Association of Nigeria (PAN) in which Oyo State has the highest number of poultry farmers. The purposive selection of the local governments in each state was based on those with the highest number of registered members of the Poultry Association of Nigeria (PAN). Local governments selected in Ogun State include Abeokuta North, Egbado North, Odeda, Remo North and Sagamu. In Osun State, Iwo, Ejigbo, Irepodun and Ilesa West. While Egbeda, Lagelu, Atiba, Oyo East, Ona Ara and Oyo West local governments were selected in Oyo State.

The third stage was the random selection of one hundred and twenty (120), one hundred (100) and one hundred and forty (140) poultry egg farmers selected from Ogun, Osun and Oyo States respectively proportionate to the size of registered members of the Poultry Association of Nigeria (PAN) in each state. Also, the number of farmers selected in each selected Local Governments Area is proportionate to the size of registered members of the Poultry Association of Nigeria (PAN) in each LGAs. In all, three hundred and sixty (360) poultry egg farmers were sampled. However, due to incomplete responses, only three hundred and forty three (343) questionnaires were used for the analysis.

Analytical techniques: Data collected were analyzed with descriptive statistics and logit

regression model. The descriptive statistics was used to examine the extent of access to credit by the poultry farmers while the logit regression model to determine the factors influencing poultry farmers willingness to access credit.

Logit regression model: The logit regression model is a unit or multivariate technique which allows for estimating the probability that an event occurs or not by predicting a binary dependent outcome from a set of independent variables. There are two reasons for choosing Logit model for this study instead of linear probability and probit models according to 18. Logit model ensures production of probability of choice within (0, 1) range. This is an advantage over linear probability model and it is easier and more convenient to compute than probit model. The logit model is based on cumulative logistic probability function and it is computationally tractable. According to 19, it is expressed as:

$$P_i = E \left(Y = \frac{1}{X_1} \right) = \beta_1 + \beta_2 X_2 + \beta_3 X_i$$

..... (1)

For ease of estimation, Eq. 1 is further expressed as:

$$P_i = \frac{1}{1+e^{-z_i}} = \frac{e^z}{1+e^z}$$

..... (2)

Where:

Pi = Probability of an event occurring

$$Z_i = \beta_1 + \beta_2 X_2 \dots \dots \dots (3)$$

The empirical model of the logistic regression for this study assumed that the probability of the poultry farmers' access to credit is expressed as:

$$P_i = \frac{e^{(b_0+b_1X_1+b_2X_2 \dots \dots \dots b_7X_7)}}{1+ e^{(b_0+b_1X_1+b_2X_2 \dots \dots \dots b_7X_7)}} \dots \dots \dots (4)$$

P_i range between zero and one and it is non-linearly related to Z_i. Z_i is the stimulus index which range from minus infinity to plus infinity and it is expressed as:

$$Z_i = \ln \left(\frac{P_i}{1-P_i} \right) = b_0 + b_1 X_1 + b_2 X_2 \dots \dots \dots b_7 X_7 + u \dots \dots \dots (5)$$

To obtain the value of Z_i, the likelihood of observing the sample was formed by introducing a dichotomous response variable. The explicit logit model is expressed as:

$$Y_i = b_0 + b_1 X_1 + b_2 X_2 \dots \dots \dots b_7 X_7 + u \dots \dots \dots (6)$$

Where: Y = Dichotomous response variable (1 for poultry farmers who had access to credit, 0 otherwise)

X₁ = Age of farmers (years) X₂ = Years of formal education (years)

X₂ = Gender (dummy = 1 if female, 0 otherwise)

X₃ = Education (years)

X₄ = Access to Insurance (dummy = 1 if yes, 0 otherwise)

X₅ = Poultry rearing experience (years)

Poultry farms' characteristics:

X₆ = Stock size (number of layers stocked)

X₇ = Biosecurity Index

b₁-b₇ = Coefficients of stimulus variables

b₀ = Constant term u = Error term

Table 1: Socio-Economic Characteristics of Poultry Egg Farmers

Characteristics	Frequency	Percentage (%)
Age (Years)		
<30	23	6.7
30-39	101	29.5
40-49	136	39.7
≥ 50	83	24.2
Mean = 42	S.D = 8.86	
Sex		
Male	255	74.3
Female	88	25.7
Marital Status		
Married	288	84.0
Single	36	10.5
Divorced	7	2.0
Widowed	12	3.5
Household Size		
1-3	53	15.5
4-6	244	71.1
>6	46	13.4
Mean = 5	S.D = 2.0	
Level of Education		
Adult Literacy Training	4	1.7
Some Primary Education	2	0.9
Completed Primary Education	30	8.8
Some Secondary Education	4	1.2
Completed Secondary Education	105	30.6
Post-Secondary Education	193	56.3
Koranic	5	1.5
Poultry Farming Experience (Years)		
<5	50	14.6
5-10	218	63.6
11-16	46	13.4
>16	29	8.5
Mean = 9	S.D = 5.4	
Access to Credit		
No	7	2.0
Yes	336	98.0
Use of Livestock Insurance		
No	336	98.0
Yes	7	2.0
Access to Livestock Extension		
No	100	29.2
Yes	243	70.9

Results

Socio-economic characteristics of poultry egg farmers: Table 1 presents socio-economic characteristics of poultry egg farmers. Majority (74.3%) of the poultry egg farmers were male. The average age of chicken egg farmers in the study area was 42 ± 8.9 years with majority (75.9%) below 50 years. Majority (84.0%) of the poultry egg farmers were married as indicated in Table 1. Average household size of the poultry egg farmers was 5.0 ± 2.0 persons. More than half (57.8%) of the farmers were educated above secondary education. More than half (63.6%) of the farmers had between 5-10 years of layers rearing experience with the mean years of experience being 9.0 ± 5.4 years. Majority (98.0%) of the poultry egg farmers had access to credit while the remaining (2.0%) were discovered not to have access to any source of credit. Only 2% of the farmers insured their poultry farms as shown on Table 1. Majority (70.9%) of the

farmers had access to disease control and medication advisory services.

Determinants of poultry egg farmers' access to credit

The factors determining the poultry egg farmers' access to credit are presented in Table 2. The diagnostics statistics revealed that the chi square distribution which was used to test the overall model adequacy was significant at 1% ($\chi^2 = 37.56$, $p < 0.0000$) and log likelihood function of -211.5659. The variables that had significant co-efficient are gender (X_2), years of education (X_3), access to livestock insurance (X_4), stock size (X_6) and biosecurity level (X_7). Gender was significant at 1% level while years of education, stock size and biosecurity level were all significant at 5% level. Also, access to livestock insurance was significant at 10%. Only stock size had negative co-efficient while all other three variables had positive co-efficient.

Table 2: Determinants of poultry egg farmers' access to credit

Explanatory variables	Marginal/probability coefficients	Standard error	t-value
Age of poultry farmers	0.0038	0.0035	1.11
Gender (female = 1)	0.2189	0.0592	3.70****
Years of formal education	0.0183	0.0074	2.49**
Access to Insurance	0.2442	0.1412	1.73***
Stock size	-0.00006	0.00003	-2.32**
Poultry rearing experience	0.0898	0.0607	1.48
Biosecurity Index	0.3731	0.1818	2.05**

Source: Field Survey Data, 2018.

*Significant at 10% level; ** Significant at 5% level; *** Significant at 1%

Discussion

Majority (75.9%) of the poultry egg farmers were below 50 years which implied that most of these poultry farmers were in their active and productive years who can easily understand and adopt new innovations that

could assist to enhance their productivity. Majority (74.3%) of the poultry egg farmers were male which indicates that poultry egg farming is still predominantly a male occupation likely because of the high level of risk involved. Consistent with this finding are

the findings of 20; 21; 22. More than half (57.8%) of the farmers were educated above

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expected to affect their attitude towards adoption of scientific techniques positively in order to improve their level of operation on the farm. Average poultry egg farming experience was nine years. This was expected to manifest in high level of poultry management as the longer the years of layer rearing experience, the more exposed the farmer becomes and the more efficient the farmer is expected to be in poultry management. There was low participation in livestock insurance as only few (2%) of the farmers insured their poultry farms. This indicates that poultry egg farming are vulnerable to risks without a formal mitigation option especially livestock insurance. Almost all (98%) of the poultry farmers had access to credit which indicates finance is not a problem to the poultry farmers in the study area.

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with the relationship between sex of poultry farmer and access to credit implied that *ceteris*

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poultry farmer will be above any given level, 0.2 times higher for a male poultry farmer than for a female poultry farmer. This can be explained by the fact that culturally in, Southwestern Nigeria, men own and have more access to resources than women.

Conclusion and Applications

1. Poultry egg farming is dominated by male farmers.
2. More than half of the poultry egg farmers were educated above secondary education.
3. Majority of the poultry egg farmers had access to credit while almost all of the farmers did not insure their farm.
4. Factors that influenced the poultry farmers' access to credit include gender, years of education, stock size and biosecurity level.
5. The study recommends that the government should formulate a policy that will be assisting the poultry farmers to get more funds at the lowest rate of interest in order to assist them in production expansion.

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