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Accessibility of Agroforestry Farmers to Credit Facilities on Poultry Egg Production in Oyo State, Nigeria

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Authors' contributions

This work was carried out in collaboration between both authors. Author AFA designed the study, author IOO performed the statistical analysis, wrote the protocol, Author AFA wrote the first draft of the manuscript. Author IOO managed the analyses of the study. Both authors managed the literature searches, read and approved the final manuscript.

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ABSTRACT

Poultry egg production is an economically viable investment among Agroforestry farmers in Southwestern Nigeria but paucity of funds and high cost of inputs are major problems in their business operations. This study focused on the effects of accessibility and non-accessibility of Agroforestry farmers to credit on poultry egg production. Data were randomly collected from 120 poultry farmers with a structured questionnaire which comprised of 60 credit beneficiaries (CB) and 60 non-credit beneficiaries (NCB) Agroforestry farmers. The data were analyzed with mean, percentages, frequency distribution, logit and multiple regression analyses. The results of the analyses indicated that the mean age of the CB and NCB Agroforestry farmers were ±46 and ±56 years respectively. Majority of the farmers were married CB (77.4%) and NCB (81.0%). The logit regression analysis revealed that the age of the respondents had a positive relationship with access to credit at 5% level of significance. Multiple regression model for credit accessed farmers indicated that age, family size, drug quantity are positively related to output and are significant at

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10% and 1% levels. Multiple regression result for NCB farmers shows that the quantity of drug used is positively related to the egg output at 1% level. The hypotheses tested show that there was a significant relationship between socio-economic characteristics and the egg production in the study area and; between the output of farmers who are credit beneficiaries and non-credit beneficiaries. The major constraints to poultry production in Agroforestry system were limited finances, high cost of inputs and poor quality of day old chicks. Accessibility to formal credit facilities has a key role to play in Agroforestry poultry farming. Individuals, Governments and NGOs should therefore facilitate empowerment of youths in poultry egg production.

Keywords: Agroforestry farmers; accessibility; credit facilities; egg production; logit regression.

1. INTRODUCTION

The importance of Agroforestry to poultry production cannot be overemphasized as it underpins the complementary benefits that arise from the trees, the soil and the poultry birds in terms of sustainable development. According to Yates et al. [1] the main benefits arising from the use of trees to poultry birds are potential changes to the micro-climate and animal welfare in particular protection and possibly a sense of security from aerial predators. In the existing poultry production (egg or meat) systems among agroforestry farmers, birds are not allowed to range except when poultry houses are needed to be sanitized [2]. Moreover, rearing of poultry birds for meat and egg production are usually not meant to be carried out in a noisy environment. This is one of the essences of agroforestry contribution to poultry egg production with other associated benefits that offer welfare and/or environmental benefits. Poultry housing, local climatic conditions and breed differences will also interact with these changes**.** Despite this economic benefit from the integrated system of poultry production and Agroforestry, poultry practice by Agroforestry farmers still have challenges in egg production due to the problem of access to credit facility. Poultry practice has economic value to man as a source of meat, egg and fiber. It is a part of the subsistence agricultural system in Nigeria with egg as one of its major products. Egg production is most vital due to key contributions to the national economy in the spheres of generating employment opportunity, additional income and improving the nutritional level. Egg production involves the use of good layer birds for the purpose of table egg production [3]. Eggs are a major source of animal protein in human diet. According to Orji and Chukwuma [4] the poultry goes a long way in providing animal protein for the populace because it yields quickest returns and provides for meat and eggs in a very short time. Iwen [5] reported that proteins are required for the growth of young ones, formation of gametes in reproduction, formation of digestive juices, repair of worn-out tissues or cells, production of anti-bodies as well as enzymes and hormones in the body. Tijjani et al. [6] reaffirmed that animal proteins are more “biologically complete” than vegetable proteins with regards to their amino-acid composition. The dearth in the quantity and quality of protein supply in Nigeria is a challenge that is beyond dependence on plant protein alone. According to Fasasi [7], Nigeria has a total land area of 98.3 million hectares out of which 71.3 million hectares (72.5%) are cultivable, while 34.2 million hectares representing 48% of the cultivable area are actually being cultivated and less than 10% of the arable land is irrigated. It suffices, therefore, to explore quality protein of animal origin of which poultry egg is of prime importance. Nwaru and Onuoha [8] Further observed that when agricultural credit is properly extended and utilized, it encourages diversification which stabilizes and often increases resource productivity, agricultural production, value added and net incomes of farmers. Credit is therefore a necessary input in the various aspects of farm operations. Agricultural production needs to rise at least by some six percent per annum for Africa to be able to meet its food needs and for African agriculture to become a real motor for economic development [9,10]. Nigerian agriculture is abysmally under-financed. Currently agriculture accounts for about 40 percent of the GDP, yet it receives only one percent of total commercial bank loans [11].

Efforts to deliver formal credit and financial services to the poultry farmer in developing countries have failed over the years [12,13]. Commercial banks generally do not serve the needs of the poultry because of the perceived high risk and the high transaction costs associated with saving deposits and loans. To fill the gap, governments have tried to deliver formal credit to farmers by setting up special agricultural banks or directing commercial banks to give loans to borrowers. Despite this initiative,

agricultural credit still seems insufficient. This insufficiency was due to several problems on the side of the financial institution which could be as a result of supervision insufficiency, political interference, etc. [14]. More so, 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 who actually need it [12]. Another problem is increase in default rates of agricultural loans which have made the sector non-viable as it gives a negative margin [15]. High default rate was identified as one of the major reasons of bank's reluctance to give loans to farmers [16]. 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 remains a critical means through which many problems confronting poultry farmers can be resolved. Primarily, it assists in breaking the chains of the vicious circles of poverty which has been the main cause of low productivity and low income of the poultry farmers [17]. 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 has been highly limited. In modern farming business in Nigeria, beyond poor access, efficient utilization of credit is fast becoming a major factor limiting farm productivity and farmer's income [18]. One of the reasons why food security has not improved in the country may likely be because the amount of credit given to the farmers is not enough for them to improve their method of farming. Therefore, this study investigated the accessibility of Agroforestry farmers to credit facilities on poultry egg production in Oyo State Nigeria with the following objectives: describe the socio-economic characteristics of Agroforestry farmers in poultry egg production; determine the factors affecting access to credit; output of poultry egg production; and identify the constraints faced by poultry egg production in the study area.

2. METHODOLOGY

The study was carried out in Oyo state which is made up of thirty three (33) Local Government Areas (LGAs) with four (4) agricultural zones. Which are: Oyo, Ibadan-Ibarapa, Ogbomoso, and Saki Zones. Oyo State covers a total land area of about 27,249,000 square kilometers with a total population of about 5.6million (National Population Commission, 2006). It is situated between Latitude 7ºN and 19^{o}N and Longitude 2.5ºE and 5ºE of the meridian. It is located in South-Western Nigeria. The city has a population of 1,338,659 in 2006 and more than 96 per cent of the inhabitants are Yoruba. The capital is Ibadan which has a tropical wet and dry climate, with a lengthy wet season and relatively constant temperatures throughout the course of the year. This good weather condition makes poultry a thriving business among farmers in the study area. Primary data was collected through a well-structured questionnaire. A two-stage sampling technique was employed in selecting the respondents. The first stage involved purposive selection of six LGAs based on where Agroforestry is practiced with poultry production and these areas are Egbeda, Oluyole, Afijio, Surulere, Saki North and Ibarapa central LGAs. The Agroforestry farmers in poultry production were selected from the estimated numbers of poultry farms in the state. There is over 320 estimated poultry farms, most of which have not registered with Oyo State Branch of Poultry Farmers Association of Nigeria [19]. However, the second stage of the sampling procedure involved the random selection of respondents from the estimated poultry farms in the selected LGAs in proportionate to size. In all, 120 Agroforestry farmers were randomly selected through a questionnaire. Ten (10) poultry farmers with credit facility and another ten (10) without credit facility were selected from each of the selected Local Government areas (LGAs) for the study. Both descriptive and inferential analytical tools were used to analyze the data collected. Frequency and simple percentages as descriptive tools and logit multiple regression as the inferential tool employed.

Model specification for inferential statistical tool:

$$\text{Yi} = \log \frac{Pi}{1-Pi} = \beta o + \beta i Xi + Ui$$

Yi = Access of ith poultry farmer to credit (1 = if acquired credit, 0 = if otherwise)
X_1 = Age (years)
X_2 = level of education
X_3 = Family size
X_4 = visitation by extension agent
Ui = Error term

Multiple regression analysis:

The multiple regression model was used to determine the factors affecting poultry egg production in the study area.

$Yi=\beta 0+\beta_1X_1+\beta_2X_2+\beta_3X_3+\beta_4X_4\ldots\ldots\ldots\ldots\ldots+\beta_{10}X_{10}+Ui$

Y = Output (Total Revenue)
X1 = Sex
X2 = Age
X3 = Marital Status
X4 = Level of Education
X5 = Family Size
X6 = Year of Experience
X7 = Extension Agent Visit
X8 = Feed Quantity
X9 = Drug quantity
X10 = Vaccine quantity
$ß_S$ = The Unidentified Parameter Estimated.
Ui = Error Term

3. RESULTS AND DISCUSSION

Table 1 revealed that the mean age of credit beneficiary and non-credit beneficiary poultry farmers in the study areas shows that the mean age of farmers with access to credit was ±46 years while that of non-credit access was ±56 years. Majority of the respondents were 41-50 years and 51-60 years for credit and non-credit beneficiaries' Agroforestry farmers respectively. This result is line with the findings of Aromolaran et al. [20] that small scale layers farming was common among aging farmers. The majority (77.4%) of the credit access farmers and most of the non-credit access farmers (81.0%) were married. This shows that agriculture, especially poultry production was the business of married people. This result corroborates that of Chioma et al. [21] that majority of poultry farmers are married individuals with responsibilities. Looking at the years of experience for both credit access and non-credit access farmers, 37.7% of the farmers with credit had been practicing egg production for between 11-15 years while those with no access to credit was 59.5%. It was expected that farmers with more years of poultry farming experience should be more efficient and that their chances of obtaining credit facilities were higher than farmers with only a few years of experience and this agrees with the findings of

Table 1. Socio-economic characteristics of the respondents with access and non access to credits

Variables	Credit (N=53)		Non-credit (N= 42)	
	Frequency	Percentage	Frequency	Percentage
Age range				
≤30	1	1.9	-	-
31-40	9	16.9	-	-
41-50	23	43.5	10	23.8
51-60	19	35.8	22	52.4
≥61	1	1.9	10	23.8
Level of education				
Primary education	-	-	1	2.4
Secondary education	16	30.2	9	21.4
Tertiary education	37	69.8	32	76.2
Year of experience				
1-5	6	11.3	1	2.4
6-10	14	26.5	1	2.4
11-15	20	37.7	6	14.3
16-20	9	17.0	25	59.5
≥ 20	4	7.5	9	21.4
Gender				
Male	39	73.6	31	73.8
Female	14	26.4	11	26.2
Family size				
1-3	6	11.3	-	-
4-6	32	60.4	12	28.6
7-9	15	28.3	29	69.0
>9	-	-	1	2.4
Cooperative				
Yes	53	100	41	97.6
No	-	-	1	2.4

Otunaiya et al. [22]. A majority of both Agroforestry farmers with access to credit (73.6%) and those with non-access to credit (73.8%) were male indicating that poultry egg production is basically male dominated agribusiness. This was expected, given the drudgery nature, physical and energy demand as well as capital intensive nature of investment required to establish poultry-egg enterprise. Majority (60.4%) of credit access farmers had family sizes of (4-6) persons, while most (69.0%) of non-credit farmers had household size of (7-9) persons. Effiong and Onuekwusi [23] and Idiong [24] reported that relatively large household size enhances the availability of labour, although, large household size may rob a farmer the opportunity of obtaining financial help in form of credit, as this credit may be directed to some other family matters. Also, all (100%) of credit access farmers and (97.6%) of non-credit farmers belong to different co-operative societies, while (2.4%) of non-credit farmers did not belong to co-operative societies. The essence of co-operative was to help educate the members and support them to be financially stable. This is in line with [22] that over 80% of egg farmers were members of cooperative societies in Oyo State which helps them in solving some of their problems.

The analysis in Table 2 revealed the result of logit model used to determine the factors affecting access to credit in the study area. The result shows that age of respondents has significant and positive relationship with access to credit by the poultry egg farmers at 5% level of significance. This implies that, as the age of Agroforestry farmer's increases, so also the tendency to gain more access to credit facilities. This is line with [21] that most of the farmers in Ogun State had access to credit facility which corresponds with the age of farmers in poultry business.

From Table 3, the result revealed that the factors affecting output of poultry egg. It shows that age, family size and drug quantity are positively related to output at 10% and 1% level of significance. This implied that as age, family size and drug quantity used increases, the output of Agroforestry poultry farmers also increases. Marital status (singles) has negative significance

Table 2. Logit regression results on factor affecting access to credit in the study area

Sex	Coefficient	Std. Err.	z	P>|z|
X_1 Age of farmer	.0902277**	.0451034	2.00	0.045
X_2 Level of educ	.6057318	.5945613	1.02	0.308
X_3 Family size	-.1179183	.2038809	-0.58	0.563
X_4 Extension	.1686712	.248674	0.68	0.498
Constant	-5.412192	2.857995	-1.89	0.058

*LR chi2 (4) = 7.26; Prob > chi2 = 0.1230; Log likelihood = -30.853653; Pseudo R^2 = 0.1052; **Sig at 5%*

Table 3. Determinants of egg production among agroforestry farmers with access to credit

	Coefficients				
Model	**Unstandardized coefficients**		**Standardized coefficients**	**T**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	-16263.342	19703.56		-.825	.421
Sex	-1822.140	5420.843	-.017	-.336	.741
Age	1022.371*	518.335	.197	1.972	.066
Marital status	-7214.321*	3625.607	-.099	-1.990	.064
Level of education	-839.354	5721.680	-.008	-.147	.885
Family size	2687.434*	1395.594	.092	1.926	.072
Years of experience	-624.224	852.969	-.069	-.732	.475
Extension agent visit	-3340.544	1938.892	-.081	-1.723	.104
Feed quantity	-.204	.982	-.013	-.208	.838
Drug quantity	314.483***	54.838	.839	5.735	.000
Vaccine quantity	875.604	1373.566	.093	.637	.533

*R^2 = 0.874, *Sig at 10%, **Sig at 5%, ***Sig at 1%; Adjusted R^2 = 0.858*

on the farmers' output. This implies that the married farmers have significant relationship with increasing output than with unmarried farmers. The R^2 value of 0.874 implied that the regressors accounted for 87.4% of the variations in the total output of credit access among Agroforestry farmers in poultry egg production. The result also revealed that access to credit facility and socio-economic characteristics had positive coefficient and significantly related to the output. This is in line with [25] that as the socioeconomic characteristics level increases, the output efficiency in egg production also increases.

Table 4 shows the determinant of egg production among Agroforestry poultry farmers without access to credit. Drug quantity used was positively related to the egg production output and significant at 1% level. This implies that, as the drug quantity used by the poultry farmers increases so also is the total output of the farmer increases. Family size has a negative significant relationship with the total output at 5%. The R^2 value of 0.829 implies that the regressors accounted for 82.9% of the variations in the output of Agroforestry farmers without access to credit facility which influences positively some socio-economic characteristics especially the quantity of drug used while 17.1% could be explained by the error term.

3.1 Constraints to Poultry Egg Production among Agroforestry farmers in the Study Area

From Table 5, constraints to poultry egg production in order of importance in terms of severity of the challenges. Limited finance was the major problem confronting poultry farmers in egg production. This result is in tandem with the submission of [26] that lack of finance is often a major problem to both extensive and semi-intensive poultry production among poultry producers in Delta State Nigeria. This could be the major challenge to farmers from not being able to acquire the necessary inputs, especially fixed inputs for large scale production which attracts higher profit and efficiency. This is also supported by the submission of [27] that technical efficiency of production was highly influenced by financial constraints. This was because in addition to the quantity of inputs

Table 4. Determinants of egg production among agroforestry farmers without access to credit

Coefficients					
Model	**Unstandardized coefficients**		**Standardized coefficients**	**T**	**Sig.**
	B	**Std. error**	**Beta**		
(Constant)	76533.371	46883.11		1.632	.119
Sex	-455.206	7462.633	-.004	-.061	.952
Age	1028.995	623.277	.136	1.651	.115
Marital status	-4082.389	4411.530	-.069	-.925	.366
Level of education	-9648.249	7990.910	-.084	-1.207	.242
Family size	-6203.229**	2663.314	-.190	-2.329	.031
Year of experience	-1736.480	1276.162	-.125	-1.361	.190
Extension agent visit	2266.173	2722.286	.058	.832	.415
Feed quantity	-.396	1.471	-.024	-.269	.791
Drug quantity	289.743***	66.986	.815	4.325	.000
Vaccine quantity	1028.491	1639.260	.108	.627	.538

*Dependent Variable: Total Output; R^2 = 0.829; Adjusted R^2 = 0.791; Source: analysis from field survey 2016; *Sig at 10%, **Sig at 5%, ***Sig at 1%*

Table 5. Distribution of challenges encountered in egg production by agroforestry farmers

Constraint	Very severe	Severe	Moderate	Rank
Limited finance	15	2	21	1st
High cost of input	17	8	10	2nd
Poor quality of day old chicks	16	10	12	3rd
Scarcity of raw materials for chicks	9	18		4th
Lack of storage facilities	10	11		5th
Marketing of product	2	10		6th

used, the timing of input usage also affects farm output. High Cost of Inputs was the next severe constraint identified by the respondents and it makes it very difficult for the existing farms to expand their scale of operation while the upcoming ones are reluctant to go into the business. Also stocking of poor breeds of poultry was tantamount to waste of efforts because such breeds are positioned to get infected with diseases than good breeds due to high cost of input.

4. CONCLUSION

It is therefore concluded that level of education, years of experience and membership of cooperative society play significant roles in credit used on poultry egg production and the major source of credit to poultry farmers was from their personal savings. From the result of the regression analysis, the determinants of poultry egg production are age, family size, drug quantity and marital status for farmers with access to credit as well as drug quantity and family size among poultry farmers without access to credit while the major problem encountered by Agroforestry farmers was limited capital in poultry egg production.

5. RECOMMENDATIONS

i. The study identified poor saving ability of the farmers as the reason for credit inequality. Therefore, enhancing mobilization of savings and access to savings facilities to enable Agroforestry farmers to demonstrate financial stability and credit-worthiness. Savings enhance poor people's self-reliance and act as a safeguard against risk in times of emergency.

ii. Government should enact policy that would promote both formal and informal rural financial institutions to extend equal credits to farmers as this will help to improve poor people's access to appropriate and sustainable credit.

iii. Any measure adopted to reduce the cost of drug used in egg production will lead to increased profitability.

iv. Research should focus on developing drug production at affordable cost for agroforestry poultry egg producers.

v. Governments and NGOs should therefore facilitate empowerment of youths in poultry egg production.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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