SOCIO-ECONOMIC FACTORS INFLUENCING EGG PRODUCTION IN IREPODUN LOCAL GOVERNMENT AREA OF KWARA STATE

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Abstract: The study on the analysis of socio-economic factors influencing egg production was carried out in Irepodun Local Government area of Kwara State, Nigeria. The specific objectives were to: describe the socio-economic characteristics of egg farmers; determine the effect of socio-economic variables on egg production and identify the constraints faced by poultry farmers in the study area. Purposive sampling technique was employed for the study. Structured questionnaire was administered to fifty-eight (58) poultry egg farmers. Descriptive statistics and multiple regression models were used as analytical technique. The findings indicated that most of the respondents (62%) were males and between 40-49 years of age and with an average of 7 years' experience in the business. Furthermore, egg production business in the area was found to be dominated by small scale poultry-egg farms which accounted for about 50% of the total farms. It was found that over 98.2% of the cost of production was on the variable inputs. Only the parameters estimate of flock size, feed intake and labour were of statistically significant, indicating that Flock size contributed incrementally to the total value of poultry-egg output in the study area. The study also revealed that farm size and extension contact were the major socio-economic variable that as a significant effect on the farmer's revenue. The study identified limited finance and high cost of inputs as the most serious constraints to the poultry-egg business in the area. It is recommended in the study that a modern feed mill should be established in the state by all stakeholders in the poultry sub-sector; extension agents should be encouraged; credit and inputs should be made available and affordable to poultry farm owners.

Keywords: Socio-economic, efficiency, multiple regression

Introduction

Poultry refers to all birds of economic value to man as source of meat, egg and fiber. Egg production involves the use of good layer birds for the purpose of table egg production (Ogunlade and Adebayo, 2007). Birds that are raised as poultry include fowls, turkey, ducks and geese, among others. Poultry production consists of two parts: poultry egg production and poultry meat production. Eggs are major sources of animal protein in human diet. According to Oji and Chukwuma (2007), poultry goes a long way in providing animal protein for the populace because it yields quickest returns and provides meat and eggs in a very short time. Esingmer (1991) and Banerjee (1992) added that poultry eggs nearly approach a perfect balance of all food nutrients. The yolk and albumen contain 17.5% and 10%, respectively protein by weight. It was also found by the Food and Agricultural Organization of the United Nations (FAO, 1990) that eggs rank second to cow milk in terms of nutritive value and is the most economically produced animal protein.

One of the major challenges facing Nigeria is the satisfaction of the ever-increasing demand for protein. Most Nigerian diets are deficient in animal protein. The FAO recommends that the minimum intake of protein by an average person should be 65 g per day; of this, 36 g (that is, 40%) should come from animal sources. The country is presently unable to meet this requirement. The animal protein consumption in Nigeria is 15 g per person per day (Tijjani *et al*., 2012) which is a far cry from the FAO recommendation. As a result, wide spread hunger, poor, and stunted growth as well as increase in spread of diseases are evident in the country. Animal protein is an essential part of human nutrition because of its biological significance. Animal protein sources include fish, egg, poultry meat, beef, milk, beacon, pork, and mutton; but they are not affordable. The common sources accessible to most Nigerians are frozen fish, beef, and local chickens. Many farmers are involved in poultry production especially in Kwara State Nigeria, but the level of the productivity still remain local and small-scale. Various studies (Tijjani *et al*., 2012; Nurudeen, 2012; FAO, 2010; Yusuf and Malomo, 2007; Ojo, 2003) reached a consensus that intensification of production of meat and eggs derived from prolific animals like poultry birds is germane to meeting animal protein requirements from domestic sources (Etim *et al*., 2005).

Statement of the problem

Hunger and malnutrition are among the most devastating problems facing the world Poor. The Food Insecurity Report by FAO (2002) estimated that 799 million people in 98 Developing nations are not getting enough food to live a normal, healthy and active live. The supply of agricultural products from any nation to satisfy human wants and resources used in their production are very vital, due to their limited supply and stiff competition for the resources by many enterprises (Fasasi, 2006). Most developing countries, including Nigeria have the problem of insufficient food production and protein deficiency. Nigerian agriculture belongs to the real sector of the economy and it is characterized by multitude of small-scale farmers scattered over wide expanse of land area, with small holdings ranging from 0.05 – 3.0 hectares per farm land, rudimentary farm systems, low capitalization and low yield per hectare (Fasasi, 2006). This may be one of the reasons why the egg of food in the country has not increased at the rate that can meet the increasing population. The Central Bank of Nigeria (2004) confirmed that while food production increases at a rate of 2.5%, food demand increases at a rate of more than 3.5% due to high rate of population growth (2.83%) leaving a food deficient of 1% currently experienced in the country. In another study by the Federal Ministry of Agriculture Water Resources and Rural Development (1988), it was revealed that Nigeria's agriculture, not only failed to meet up with its food

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production in order to meet the food requirement of the increasing population, its greatest problem is that of inadequate animal protein in the diets of a large proportion of the population especially in the rural areas which constitute over 70% of the Nigerian population. This is supported by Ikhatua (2000) who noted that in a nutrition profile on Nigeria, it was reported that the protein supply per caput was 44 grams out of which animal protein constituted less than 2%. He added that average value for Nigerian is estimated to be 7.5 g/head/day. The aforementioned reasons made it very difficult to ensure the attainment of FAO recommendation of thirty-five grams (35 gm) per caput of animal protein per day (Ojo, 2003). The current level of food insecurity calls for well-defined approaches in meeting the desired objectives. One of the generally adopted approaches is through increased production and productivity of the poultry sub-sector. Increasing productivity and efficiency within the agricultural sector particularly among small-scale poultry egg producers require a good knowledge of the current efficiency or inefficiency inherent in the subsector as well as factors responsible for this level of efficiency or inefficiency. This is because despite the growth in the egg production sub-sector since year 2000 in Nigeria (Tijjani *et al*., 2006), local demand has not been matched by local supply. It is against this background that this study analyzed the socio-economic factors influencing poultry egg production in Irepodun Local Government Area (LGA) of Kwara State while specific objectives were to describe the socio-economic characteristics of poultry farmers in the study area, determine the effect of socio-economic variables on egg production and to identify the constraints faced by egg farmers in the study area.

Hypotheses of the study

H_0- there is significant relationship between socio-economic variables and egg production.

H_1- there is no significant relationship between socio-economic variables and egg production.

Materials and Methods

The study area

Kwara State is one of the seven states created on 27th of May, 1967. It extends from longitude 7°45`N in its southern end, longitude 2°45`E to the west and longitude 6°40`E to south east. It covers an area of 35,705 km^2 and has a total population of 2,371,089 (NPC, 2007) with a population density of 66 people/km^2. The population of the state makes up 1.7% of Nigeria's total population. The state is basically agrarian. 80% of the population resides in the rural areas and 90% of these rural populace are farmers. Livestock production, including sheep, goat, and poultry are also popular in the state. Kwara State is divided into 16 Local Government Areas.

Method of data collection

The study made use of primary data. The primary data were collected by interview method using structured questionnaire. Information on egg output, inputs, inputs prices, output prices and socio-economic characteristics of the poultry egg farm owners as well as constraints faced by the farm owners in the study area were identified.

Analytical techniques

The analytical techniques that were used in this study include descriptive statistics and multiple regression models.

Descriptive statistics

The descriptive statistics that were used include; frequency, percentages and ranking order were used to achieve the objectives of the study.

Multiple regression model

Production function model was employed to determine the physical relationship between inputs and output. This would be used to achieve objective ii. The production technology of poultry-egg producers was assumed to be specified by the Cobb-Douglas Frontier production function (Tadesse and Krishnamoorthy, 1997), which was defined as:

$InY = \beta_o + \beta I\ InX1 + \beta2InX2 + \beta3InX3 + \beta4InX4 + \beta5InX5 + \beta6InX6 + \beta7InX7 + Ui$ ----- (7)

Where:

In = Natural logarithms; Y = Value of poultry outputs (value for eggs, poultry manure and spent/culled layers) (N)

X1 = Farm size (number of birds); X2 = Family labour (N)

X3 = Hired labour (N); X4 = Feed (N); X5 = Capital input (Depreciation of farm equipment and poultry house valued in Naira); X6 = Utilities and other expenses (made up of electricity, water supply, kerosene/gas, transportation in Naira); X7 = Veterinary services (drugs, vaccines).

$\beta1 - \beta1$ = Coefficients of parameters estimated.

To achieve objective (V) multiple regression model would be used to analyze the effect of socio-economic characteristics on the production of eggs:

$InY = \beta_o + \beta I\ InB1 + \beta2InB2 + \beta3InB3 + \beta4InB4 + \beta5InB5 + \beta6InB6 + \beta7InB7 + \beta8InB8 + \beta9InB9 + \beta10InB10 + Ui$

Where:

Y= Value of egg output

B1 = Age of Farmers (years)

B2 = Gender (sex = 1 for male and sex = 0 for female)

B3 = Marital status (MS= 1 for married and MS = 0 for single)

B4 = Education Level (Number of years of schooling)

B5 = Years of experience (Years of poultry egg farming)

B6 = Household size (number)

B7 = Access to credit (CA = 1 for access to credit and CA = 0 Otherwise).

B8 = Membership of poultry association (1= member & 0 = Not member).

B9 = Market outlets (number)

B10 = Number of extension contact.

Point Scale

Sampled poultry-egg producers were asked to rate the constraints to poultry-egg production on a 3-point numerical rating scale of very important problem=3, important problem=2, not important problem= 1. Respondents were expected to tick number between 1 and 3 against each constraint area, indicating the constraint area in poultry egg production.

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Results and Discussion

Socio-economic characteristics of poultry-egg farms owners

The results of the analysis of socio-economic characteristics of the poultry-egg farms owners in the study area are presented as follows:

Age

As indicated in Table 1, the results of the study revealed that, the average age of the decision makers of poultry egg enterprise was 40 years. This implies that egg production in the area was embarked upon by men and women who were physically strong and mentally alert to face challenges which poultry farming in the developing countries like Nigeria requires. Majority of the respondents were in the age range of (40-49) represented by 26% which in turn suggests high level of vitality for agricultural activities.

Educational status

Table 1 showed the level of education of the respondents in the study area. All the respondents attended at least primary school. It can be deduced that majority (64%) of the farmers had tertiary education, while those who had only secondary and primary education were 26 and 10% respectively. Educational level of farms owners is very important in the management of poultry and it is known to affect their farming activities. The high literacy level of the respondents would afford them the opportunity to understand and adopt modern farm practices thereby enhancing productivity and profitability. This agrees with the findings of Ikheola and Inedia (2005) which indicated a high literacy level of about 85% among poultry farms owners in Edo State.

Farming experience of the farmers

According to the result presented in Table 1, only 7% of the respondents had between 11-20 years of experience in poultry-egg enterprise and a total of 53% had between 6-10 years. The mean years of experience was found to be 7 years. This suggests that majority of the poultry-egg farms owners in the area were fairly new entrants into the business. It is generally expected that productivity increases with years of experienced. Experienced poultry-egg farms owners are likely to make better decisions to enhance productivity and income, because it is expected that experience in poultry-egg production usually determines the effectiveness of farmers' decision with respect to inputs combinations or resource allocation.

Gender

The results in Table 1 revealed that 36 of the respondents were males while 22 were females which account for about 62 and 38%, respectively. This indicates that egg production is basically male dominated. This is expected given the drudgery nature, physical and energy demand as well capital-intensive nature of investment required to establish poultry-egg farm enterprise.

Household size

Table 1 showed that poultry-egg farms owners in the study area had a mean household size of about 4 persons. Larger household size reduces labour constraint.

Marital status of the farmers

The results in Table 1 show that about three quarter (79%) of the respondents were married. The finding is almost in consonance with that of Ajala *et al.* (2007) who reported 86% (married) and 14% (single). The implication of this finding is

that majority of the respondents can be considered to be responsible in taking rational decision that can improve productivity and income.

Table 1: Distribution of socio-economic characteristics of the respondents

Variables	Frequency	%
Age		
20 – 29	7	12
30 -39	14	24
40 – 49	37	26
50 – 59	0	0
60 -69	0	0
Total	58	100
Level of education		
Primary education	6	10
Secondary education	15	26
Tertiary education	37	64
Total	58	100
Years of experience		
1-5	23	40
6-10	31	53
11-20	4	7
Total	58	100
Mean	7	
Gender		
Male	36	62
Female	22	38
Total	58	100
Household size		
1-5	44	76
6-10	14	24
<11	0	0
Total	58	100
Mean	4	
Marital status		
Married	46	79
Single	12	21
Total	58	
Cooperative membership		
Member	20	34
Non-member	38	66
Total	58	100

Membership of cooperative society

Table 1 showed that majority of the respondents (66%) did not belong to any cooperative society, while the remaining (34%) belong to one or more cooperative societies. Membership of cooperative societies is believed to enhance the sharing of information on improved technologies through interactions as well as easing inputs acquisition and utilization constraints faced by decision makers (Effiong, 2005; Kebede, 2001). The outcome of this research evidently showed that sizable percentage of the respondents were co-operatives member of society which means that they stand to benefit from some collective actions of co-operative groupings.

Scale of operation of egg production in the study area

The study revealed that about 50% of the respondents keep less than 1000 birds, 43% keep between 1000-2000 birds while only 7% of the respondents keep above 2000 birds and above (Table 2). This result implies that poultry- egg enterprise in the LGA was dominated by small scale farms category based on the classification of Omotosho and Ladele (1988) and as adopted in this work. Table 2 showed the

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feature of the different scales of operation in the study area. It can be seen that the mean flock size for the three categories (small, medium and large farms) were found to be 657, 2084 and 5375 birds, respectively. The minimum size and maximum size for small farms in the study area were 279 and 950 birds, respectively, for medium farms minimum and maximum stock size were 1000 and 4550 birds, while in the case of large scale 5000 and 6000 birds were obtained, respectively.

Table 2: Size distribution of poultry egg farms in Irepodun LGA

Farm size (no of birds)	Frequency	%	Min No.	Max No.	Average No.
Small farm (<1000)	29	50	279	950	657
Medium farm (1000<5000)	25	43	1000	4550	2084
Large farm (5000 and above)	4	7	5000	6000	5375
Total	**58**	**100**			

Table 3: Computation of the regression analysis for small farm (<1000)

Variables	Coefficients	Standard errors	t-values
Constants	-1324507	3700857	(-0.3)
Flock size	23336.41	11705.94	(1.99)**
Family labour	-27.68531	42.12017	(-0.66)
Hired labour	-56.85911	44.61981	(-1.27)
Feed	-1.488583	1.642935	(-0.91)
Depreciating cost of equipment	12.73134	33.76197	(0.38)
Utilities/other expenses	126.078	245.6475	(0.51)
Veterinary services	34.77656	72.2286	(0.48)

Diagnostics statistics: R^2 =0.3742; F- value = 1.88; N= 30; 5%- **

Table 4: Computation of Regression analysis after the test of multicollinearity and heteroscedasticity of Small farm (<1000)

Variables	Coefficients	Robu. Standard Errors	t-values
Constants	-1324507	1767974	(-0.75)
Flock size	23336.41	4604.699	(5.07) *
Family labour	-27.68531	20.19409	(-1.37)
Hired labour	-56.85911	35.53736	(-1.60)
Feed	-1.488583	.7679417	(-1.94) ***
Depreciating Cost of Equipment	12.73134	23.19591	(0.55)
Utilities/other expenses	126.078	137.2564	(0.92)
Veterinary services	34.77656	24.72373	(1.41)

Diagnostic statistic: R-squared = 0.3742; F-value = 7.07; N = 30; 10%- *; 1%- ***

Table 5: Computation of Regression Analysis for Medium Farm size (1000<5000).

Variables	Coefficients	Standard Errors	t-values
Constants	-5086708	2270675	(-2.24) **
Flock size	12897.46	1408.073	(9.16) *
Family labour	20.12673	8.840752	(2.28) **
Hired labour	20.02489	11.9766	(1.67) ***
Feed	.0277734	.2693796	(0.10)
Depreciating Cost of Equipment	-4.272247	7.907162	(-0.54)
Utilities/other expenses	130.2122	112.6506	(1.16)
Veterinary services	-46.64094	36.52136	(-1.28)

Diagnostic statistic: R-squared = 0.9676; F-value = 72.43; N = 25; 1%- ***; 5%- **; 10%- *

Table 6: computation of regression analysis for medium farm after the test of multicollinearity using the variance inflation factor and heteroscedasticity using Breusch-pagan test

Variables	Coefficients	Robu. Standard Errors	t-values
Constants	-5086708	2556343	(-1.99)
Flock size	12897.46	2138.651	(6.03) *
Family labour	20.12673	9.13226	(2.20) **
Hired labour	20.02489	9.704718	(2.06) **
Feed	.0277734	.2739313	(0.10)
Depreciating Cost of Equipment	-4.272247	7.935273	(-0.54)
Utilities/other expenses	130.2122	77.38159	(1.68)
Veterinary services	-46.64094	29.05056	(-1.61)

Diagnostic statistic: R-squared = 0.9676; F-value = 59.64; N = 25; 1% ***; 5% **; 10% *

Table 7: A robust linear regression model of the three farm sizes pulled together

Variables	Coefficient	t-values
Farm size	14830.35	6.15*
Family labour	-3.024269	-0.23
Hired labour	-4.698641	-0.38
Feed	-0.4922966	-1.18
Depreciation	-1.14491	-0.17
Utilities	86.31107	1.06
Veterinary	4.47471	0.14
Constant	-856205.5	-0.71

Diagnostic statistic: R-squared = 0.9417; F-value = 115.45; N = 58; 10%- *

Effect of socio-economic characteristics on egg production
The result below in Table 3 shows the factors that influence the output of egg production of the sampled farms which are the farm size and extension contact, which both show positive coefficient and significant at 5% each. The positive coefficient implies that there is a direct relationship between them and the farmers output of egg production. A percentage increase in these factors will yield 18374.74% and 3032733% increase in egg production in the study area. The result showed that Poultry-egg producers access to extension in this model clearly illustrate that those who had been regularly trained and visited by extension agent, trained and participated in some demonstration trials were more technically efficient. This is

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probably because extension agents frequently introduce packages and information which enhance the productivity of the farms and promote their efficiency. Similar result was gotten by Amaza (2002). In Table 8 shows that Flock size, Education, and Market outlet had positive coefficient and were significant at 10, 5, and 5%. This implies that an increase in these variables would lead to a significant increase in Egg production. The more educated the farmers are in the study area the more productive they are leading to increase egg production in the study area, this is also true about flock size and market outlet.

Table 8: Regression result showing the effect of socio-economic characteristics on egg production of small farm in the study area

Variable	Coefficient	*Standard error	t-values
Age	-15844.4	204436.4	-0.08
Gender	-3233617	2099795	-1.54
Marital status	-580836.8	2964060	-0.20
Education	3488829	2466793	1.41
Farming Exper.	401168.5	365690.2	1.10
Household size	-941547.74	723308.8	(-1.30)
Farm size	18374.74	8147.359	(2.26) **
Credit access	1500862	2915150	0.51
Market outlet	-1932217	3146857	(-0.61)
No. of Extension C.	3032733	1374265	(2.21) **

Diagnostic statistic: R-squared = 0.5986; F-value = 2.68; N = 29; 5%- **

Table 9: Computation regression analysis to show the effect of socio-economic characteristics on egg production in the study area of medium farm

Variable	Coefficient	Standard error	t-values
Age	158423.6	137423.2	1.15
Gender	14011374	1987224	0.71
Marital status	-2013730	2593127	-0.78
Education	3072103	1402020	2.19**
Farming Expr.	60293.32	323381.9	0.19
Household size	767432	500748	1.53
Farm size	12030.15	694.419	17.32*
Credit access	-27775.58	1638118	-0.02
Market outlet	2438806	1178861	2.07**
No. of Extension C.	157312.3	774160.8	0.20

Diagnostic statistic: R-squared = 0.9780; F-value = 62.14; N = 25; 10%- *; 5%- **

Due to the small number of large farms in the study area, the effect of their socio-economic characteristics on egg production could not be studied, so the three farm sizes were pulled together it was found that only the farm size and educational status of poultry farmers was significant at 10 and 1%, respectively they both had a positive coefficient showing a direct positive relationship with the farmers output of egg production as shown in the Table 9.

Table 10: Regression analysis showing the effect of socio-economic characteristics on egg production of all the farm sizes in the study area

Variables	Coefficient	t-values	Sign.
Age	120432.7	0.82	
Gender	-1873246	-1.05	
Marital status	-566404.3	-0.23	
Education	2849577	1.76***	
Farming experience	22374.18	0.07	
Cooperative soc.	-1311228	-0.47	
Household size	-46158.93	-0.08	
Farm size	12657.85	22.04*	
Credit Access	444464.6	0.15	
Mem. Poultry, Ass	855807.3	0.40	
Market outlet	-228709.6	-0.17	
No of ext. contact	158623	0.18	
Occupation	281574.1	0.54	
Constant	-1.21e+07	-1.91	

Diagnostic statistic: R-squared = 0.9417; F-value = 261.58; N = 58; 1%- *; 10%- ***

Table 11: Problems associated with egg production

Major problems	Rank order	Mean score
Disease and pest attack	1	2.91
Cost of feed	2	2.81
Availability of labour	3	2.78
Cost of drugs and vaccinations	4	2.67
Rate of mortality of layers	4	2.67
Environmental factor	6	2.66
Poaching of poultry eggs	7	2.64
Land space availability	8	2.59
Access to feed	9	2.55
Technical know how	10	2.50
Loan and credit proc.	11	2.45
Market price fluct.	12	2.36

Identification of constraint faced by farmers
The major constraints faced by farmers engaged in poultry egg production in the study area were ranked. The findings are as shown in Table 11. The table shows that disease and pest attack was the major problem as indicated by the mean score 2.91 of the poultry farmers in the study area. The findings also revealed that high cost of feed was the second major problem as indicated by the mean score 2.81 of the poultry farmers in the study area. High cost of feed such as grower, finisher, and layer mesh etc. were the second most pronounced problem associated with poultry production in the study area. It might be due to high cost of feed that has made most of the farmers in the study area to be small-scale farmers. The result also shows that availability of labour was a constraint as indicated by the mean score 2.78 of poultry farmers. Inadequate supply of labour would reduce productivity of poultry egg production. The result also shows that cost of drugs and vaccination was a major problem as indicated by the mean score 2.67 of poultry farmers in the study area. This finding is in line with the report by Tijjani *et al.* (2012). The finding also indicates that high mortality rate was a major problem faced by farmers in the study area as indicated by the mean score 2.67. High mortality rate can lead to reduction in flock size leading to reduction in egg production of farmers. Unavailability of land/space, accessibility of feed, technical know- how in handling poultry, loan procurement processes, environmental factor, poaching of poultry eggs, market price fluctuation were problems also indicated by 2.59, 2.55, 2.50, 2.45, 2.66, 2.64, 2.36, respectively of the respondent in the study area.

Conclusion
The finding reveals that poultry egg production is influence by socio economic factors in the study area. Analysis of the result also showed that inputs such as family labour, hired labour, flock size, feed, depreciating cost of equipment and operating expenses have significant relationship with poultry egg output

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in the study area. Disease and pest attack, high cost of feed, financial constraint and high mortality rate were the major problems associated with poultry egg production in the study area. Based on the findings from the study, it can be concluded that the largest proportion of poultry-egg producers in the area operated on a small-scale and that egg production was a profitable venture across scale of operation.

Recommendations
Based on the finding, the following recommendations are made:
 i.   Farmers should form agricultural cooperative groups that will enable them obtain credit from government and financial institutions.
 ii. Farmers should be provided loan and credit facilities at low interest rate in order to help them boost their poultry egg production level in the study area.
 iii. Availability of farm input such as drugs and vaccine to the farmers at the right time and at subsidized prices.
 iv. Extension agents in the state should be properly trained and provided with all necessary technological packages required to teach and guide farmers on improved poultry egg production.
 v.   It is recommended that poultry-egg producers be encouraged to increase their scale of production for increased profitability. This could be achieved if small scale farmers can come together and pool their resources together in cooperatives.
 vi. Any measure adopted to reduce the cost of feed will lead to increased profitability. Therefore, there is need for the poultry-egg producer's associations and corporate bodies to establish at least a modern feed mill in the state to provide feeds to the farms at affordable rates. Research should focus on developing feed using local materials available in the country so as to make feed available and affordable to the poultry-egg producers.
 vii. It is also recommended that stakeholders in the sector should encourage extension agents through the provision of incentives such as in-services training, scholarship and better salaries. This will enhance the efficiency of the extension service provides and in the long run, a better profit margin for producers.

Conflict of Interest
The authors declare that there is no conflict of interest related to this study.

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