



## Effect of Poultry Farmers' Socioeconomic Features on Selected Production Limiting Factors in Southwest Nigeria

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### ABSTRACT

Poultry farmers are faced with many problems that reduce their capacity utilisation. The challenges have made a lot of poultry entrepreneurs to leave the business compellingly. Many interventions have been applied to solve production problems of the poultry farmers but they have not given the desired results. Also, literatures on poultry production in Nigeria are many and growing focusing mainly on production, economic and marketing research questions. Few have linked the socio-economic factors of poultry farmers with production management and challenges. The research, therefore, analysed the effects of socio-economic characteristics of poultry farmers on selected problems of poultry farming. Two-stage sampling procedure was adopted. At the first stage, three states: Ekiti, Lagos and Ondo were purposefully selected and at the second stage, simple random sampling was used to select 320 poultry farmers in the three states out of which 307 were successful for analysis. Data were collected on 10 socio-economic characteristics and 5 production problems: adverse effect of climate change, disease incidence, high cost of transportation, high feeds cost and high cost of drugs. Frequency distribution, percentage and Probit model were used to analyse data. 76.55%, 63.84%, 68.73% and 67.10% of the farmers were male, married, into farming as main occupation and belonged to cooperative in that order. Poultry farmers using battery cage system have higher likelihood, 0.497, of facing adverse effect of climate change than the farmers using deep litter system while those in Ekiti State have lower likelihood (-0.506) of facing the problem of climate change than those in Ondo and Lagos States. The likelihood of having disease incidence declines with membership of cooperative and increase in years of experience among the poultry farmers with the coefficients of -0.705 and -0.035 respectively. Poultry farmers that are members of cooperative are less likely to have high transportation cost and high cost of feeds as problems from the coefficients of -0.525 and -0.726 correspondingly. Though the probability of having high cost of drugs as production problem increases with age of farmers, older farmers are less likely to have the problem and farmers that have poultry production as main occupation have higher probability of having high cost of drugs than those that are into poultry farming as secondary occupation with the coefficients of 0.156, -0.002 and 0.402 respectively. The study recommends that deep litter system of production should be encouraged among poultry farmers to reduce the adverse effects of climate change. Cooperative membership should be encouraged among the poultry farmers to reduce transportation cost and disease incidence on farms. Also, poultry drug related assistance should be given to the farmers that engage in the enterprise as main occupation which demands the identification of poultry farmers that are into the enterprise as main occupation.

**Key words:** Climate change, Cost of feeds, Cost of drug, Cost of transportation, Poultry, farmer, Southwest Nigeria

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## 1. INTRODUCTION

Poultry rearing as an enterprise is faced with many problems. A poultry production problem is any difficult situation that makes the farmer to use more than necessary level of input to get a unit amount of output, incur more cost than necessary to obtain a unit level of output, reduces capacity utilization, and limits the transformation of input to output and which the farmer must resolve or deal with to maximise meat or egg output (Ogunyemi & Orowole, 2020). The problems of poultry production in Nigeria have been identified by authors including management related problems like poor record keeping, poor management, wrong choice of breed, poor feed supply, inaccurate budgeting and starting too large project (Carter, 2005). Roys Farm (2016) reported poultry production problems as lack of productive breeds, poor housing, poor feeds and feeding, lack of access to drugs, poor management/care, poor training, poor record on expenses and income as well as poor transportation of poultry products. But Obidike (2011) mentioned poultry production problems as poor extension service, poor road network, lack of money to buy information media like newsletter, lack of processing and storage facilities, finance and unfavourable climatic conditions.

Some of these problems in Nigeria ((Alabi *et al.*, 2000) are similar with the report of Jamali *et al.*, (2011) for Pakistan. Perhaps, both being developing countries and poultry problems in the latter are inadequate modern poultry equipment, lack of adequate poultry knowledge rearing, absence of marketing knowledge, lack of modern communication facilities, inadequate infrastructure and logistic support, lack of financial credit, lack of private investment, absence of government help and guidance, problem of getting reasonable price, expensive poultry feed and ingredients as well as low capital base, inefficient and ineffective management, pricing and marketing to diseases. Additional studies of problems relating to farm operations, particularly poultry farm problems, include those of Shiferaw & Muricho (2011), Akinfiresoye & Agbetoye (2013), Adesiji *et al.* (2013), Meta Economics Consulting Group (2013), Alho (2015), Das (2015), Osakwe (2017), Liverpool-Tasie, Sanou & Tambo (2019), Food and Agricultural Organisation (2020), Bola-Badmus (2020) and Naira Land (2020).

Aromolaran, Ademiluyi & Itebu (2013) reported poultry problems in Ibadan, Oyo State, Nigeria, from the most to least as disease and pest attack, difficulty in credit and loan procurement processes, high cost of drugs and vaccination, market and price fluctuations, lack of technical-know-how in poultry handling, feed quality availability, high mortality of the birds, healthy breeds availability, high cost of feeds, accessibility of feed and poor infrastructure like water and electricity supply. Mentioning and rating the problems of an enterprise, as executed, are good efforts to give scale of priority in dealing with them by any institutions but may not be sufficient for resolving them. Analysing the problems along the socio-economic features of the farmers, such as shown in figures 1 and 2, is a veritable source of information since all farmers cannot have similar problems; which is the focus of this study.

Adebayo & Adeola (2005) reported that a lot of poultry entrepreneurs have left the business forcefully as a result of problems like high cost of feeds and drugs. Also, lack of foreign exchange in Nigeria to pay for imports is also adversely affecting the importation of feeds and drugs for livestock. All these pose great challenge to the survival and expansion of poultry business in Nigeria towards meeting protein requirements of the populace and assisting the government in achieving adequate local poultry production while sustaining the ban on poultry products importation.

Therefore, many interventions have been implemented to solve production problems of the poultry farmers but they have not given the desired results.



**Figure 1: Poultry Keeping Practices in Nigeria**  
Source: Dayo Adetiloye Business Hub (2022)



**Figure 2: Feeding Poultry Birds in Nigeria**  
Source: Adeite (2022)



This is because such interventions are applied in blanket without considering the specificity of the problems along socio-economic features of the farmers. All poultry farmers cannot face similar problems and where a problem is considered to be common, the perceptions of the farmers about it and its effects vary based on their socio-economic characteristics. The research, therefore, aimed at analysing the effects of socio-economic characteristics of poultry farmers on selected problems of poultry farming. Poultry entrepreneurs that face these problems are small-scale producers and any growth of the sub-sector will be largely through them though it is recognised, in line with (Oosthuysen, 2013), that poultry production systems are mix of family businesses and degrees of commercial operations from small to large scale with diverging modern technology in Nigeria and Africa in general.

The poultry production problems, for this study, are climate change adverse effect, disease incidence, high cost of medication, feeds and transportation as these are key factors in poultry production (Aromolaran, Ademiluyi & Itebu, 2013; Ogunyemi & Ajayi, 2016, Olorunwa, 2018). The socio-economic factors adopted follow those that have been used to analyse poultry production related studies (Oluwafemi, 2015; Jato, 2012; Yusuf & Bukunmi, 2015; Umunna, 2003) including but not limited to age, level of formal education, gender, experience, type of occupation, whether full-time farmer or part-time, household size, membership of social group, religion, marital status, poultry system, stock size and management system.

Since the 1960s literature on poultry production in Nigeria are many and still mounting focusing mainly on production, economic and marketing related studies. Only few, such as Adeola & Adebayo (2005) and Akintunde & Adeoti (2014) directly linked the socio-economic factors of poultry farmers with production and disease management. This research adds to existing literature on poultry study in directly linking production-limiting factors (problems) to the socioeconomic characteristics of poultry farmers. In terms of methodology, the study adopted Probit regression analysis in estimating the relationship between poultry production problems and the farmers' socio-economic characteristics. By analysing poultry production problems along the socio-economic characteristics of individual farmers, it adds to the national efforts of bridging protein deficiency gap, which can be obtained quicker through poultry business (Orakpo, 2011).

## **1.2 Theoretical Framework**

The study is guided by behavioural economic dual system theory. There are other behavioural theories like bounded rationality, rational choice, prospect theory and temporary dimensions which deal on decision taking amidst choices but are not applicable to this study. The dual system theory explains decision making as depending on information processing in two different paths (Behavioraleconomics.com, 2016; Evans & Stanovich, 2013; Psychology Glossary, 2016 and Samson, 2016). The first pathway called system 1 stipulates information processing as very fast, non-conscious and automatic and it is not detailed in terms of context and analysis. The system 2, second pathway, is the opposite of system 1 which specifies that information processing is slow, conscious, deliberate and voluntary. Further, Systems 2 agrees that decision making through information processing is explicit and detail using working memory. The poultry farmers are faced with decision making through information processing that can either follow either system 1 or system 2.



A farmer can involuntarily or voluntarily consider a production limiting factor such as lack of/inadequate/ credit facility as her farm problem which affects the profit maximisation objective adversely. On one hand, a farmer, on hearing of a production problem can say that the problem is affecting or is not affecting his farm without deliberate and conscious processing of the information in tandem with his farm peculiarities. On the other hand, the farmer can carefully, consciously and in detail, process the information, before establishing that the production problem affects or does not affect his farm. These are the two pathways, involuntary and voluntary, of establishing the perception of a poultry farmer, as an entrepreneur, on all production problems in relation to his farm output. The same explanation of dual system theory goes for any production problem at every point in time on the farm; pre-, during and post- pandemic era.

The consideration of a production limiting factor as a farm problem consciously or unconsciously is related directly to the socio-economic internal and/or external factors of the farmer. The farmer may maintain the status quo, procrastinate or not control self while taking and implementing farm decision due to system 1 or system 2 effects with implicit or explicit knowledge respectively. Whatever decision the farmer takes against any production problem will be guided by his socio-economic characteristics. The characteristics will guide the farmer more during pandemic when the production-limiting factors are aggravated.

## 2. METHODOLOGY

The study area is the southwest Nigeria and the research adopted the survey design. Two-stage sampling technique was used. At the first stage, three states: Ekiti, Lagos and Ondo were purposefully selected in the study area based on population, growing poultry business and market availability. One of the reasons for the selection of the three states is the advantage of their participation in the World Bank/State Commercial Agriculture Project. Ogun State could have been chosen but most of the farmers are close to Lagos and more or less have similar characteristics with the poultry farmers in Lagos State.

The second stage is the simple random sampling of 320 poultry farmers in the three states out of which 307 were successful for analysis. Data were collected on the socio-economic characteristics and the production problems of the farmers. Frequency distribution and percentage were used to analyse data. Maximum Likelihood estimation of Probit model was used to analyse the probability of a farmer belonging to the group that a production problem affects adversely in line with Clamara, Pena & Tuesa (2014) and Tuesa *et al.*, (2015).

In the model, the endogenous variable is a binary response of the farmers (Yes or No) that an identified production problem affects her; taking the value of 1 or 0. Assuming that for a farmer to perceive a production problem as affecting her depends on the latent variable  $Y^*$  which is determined by the farmers' characteristics, the set of exogenous variables, that are included in the vector  $X_i$ .

The model is expressed as:

$$Y_i^* = X_i\beta + \mu_i \text{ ----- (1)}$$

for:  $Y_i = 1$  if  $Y_i^* > 0$ ; and  $Y_i = 0$  if  $Y_i^* \leq 0$

where, the subscript  $i$  stands for the individual farmers,  $\beta$  is a vector of parameters and  $\mu$  is normally distributed error term with mean 0 and variance 1. In the model,  $Y_i$  is the critical threshold such that if  $Y_i^*$  is greater than  $Y_i$  the production limiting factor is a problem of the farmer and takes on the value of 1 as stated in the model.

Though  $Y_i$  cannot be observed and by assumption, it is normally distributed with same mean and variance. It is therefore possible to estimate the parameters,  $\beta$ , to get information on  $Y_i^*$  in terms of probability. Thus

$$P_i = P(Y_i = 1 | X) = P(Y_i \leq Y_i^*) = P(Z_i \leq \beta X_i) = F(\beta X_i) \text{ ----- (2)}$$

where,  $Z$  is the standard normal variable,  $Z \sim N(0, \sigma^2)$  and  $F = \left(\frac{1}{\sqrt{2\pi}}\right) \int_{-\infty}^{\beta x_i} e^{-z^2/2} dz$  is the cumulative distribution function of a normal variable.

The socio-economic features,  $X_i$ , of the poultry farmers of interest include the following

$X_1$  = Age of Household Head (in years).

$X_1^2$  = Age Square

$X_2$  = Farmer's Household Size (number of individual in each household).

$X_3$  = Farmer's Formal Education in Years (No education = 0, Primary education = 6 years, Junior Secondary School = 9 years, Senior Secondary School = 12 years, NCE/ND = 15 years, HND/B.SC = 17 years, PGD/Master's degree = 18 years, Ph.D = 21 years).

$X_4$  = Farmer's Gender (Dummy: 1 = Female, 0 = Male).

$X_5$  = Farmer's Marital Status (Married Dummy: 1 = Married, 0 = Otherwise).

$X_6$  = Main Occupational Group Dummy (1 = Farming, 0 = Non-Farming).

$X_7$  = Membership of Socio Group - Cooperative (Membership Dummy: 1 = Membership, 0 = Non-Membership).

$X_8$  = Farmer's location (Lagos State Dummy: 1 = Lagos, 0 = Otherwise if Ekiti or Ondo).

$X_9$  = Farm location (Ekiti State Dummy: 1 = Ekiti, 0 = Otherwise if Lagos or Ondo).

$X_{10}$  = Poultry System (Battery Cage Dummy: 1 = Battery Cage, 0 = Otherwise)

$X_{11}$  = Farming experience in Years

The coefficient represents the change in probability of a farmer having a production limiting factor as a problem, when  $X_i \in \{X\}$  change, *ceteris paribus*. The analysis enabled the determination of those farmers' factors that affect the likelihood of a production limiting factor as a farmer's problem by using significant coefficients. The analysis was done for each of the identified problems of poultry production.



### 3. RESULTS AND DISCUSSION

#### 3.1 Socio-Economic Characteristics of Respondents

Table 1 shows the socio-economic characteristics of respondents in terms of gender, marital status, age, main occupation, socio-group membership, type of production method and farming experience. From the table, 76.55 and 23.45 per cent were male and female; 36.16 and 63.84 per cent were single and married respectively. 68.73 and 31.27 per cent had farming and non-farming as their main occupation in that order. These results are comparable with Adesiji *et al.* (2013) and Olorunwa (2018). On age, 0.65, 31.60, 35.83, 16.29, 12.70 and 2.93 per cent of the respondents were less than or equal to 20 years, within 21 to 30, 31 to 40, 41 to 50, 51 to 60 and greater than or equal to 61 years of age respectively. These imply that the respondents were mostly adults with families.

Moreover, 67.10% belonged to farmers' cooperative group and 32.90% did not belong to any farmer's cooperative. This implies that some farmers are yet to be part of group to harness socio-capital. It is possible that such farmers had been members of socio-group before the research survey but ceased to be members due to one reason or the other. Most of the farmers (84.36%) were using battery cage system of production while 15.64% were using deep litter system. In addition, majority of the farmers [65.47%] were of 1 to 6 years poultry experience, only 2 farmers representing 0.65% had less than 1 year experience while 23.78% had 7 to 12 years of experience with 1.63, 2.93 and 3.58 having 13 to 18, 19 to 24 and 25 to 30 years of experience. Six of the farmers, 1.95 per cent had more than 30 years of experience. The implication of this is that the farmers are knowledgeable in poultry problems such that they could report on poultry production problems as they are affected in relation to their socio-economic features.

#### 3.2 Poultry Production Limiting Factors and Socio-Economic Features of the Farmers.

##### 3.2.1 Adverse Effect of Climate Change as a Problem among the Poultry Farmers

From table 2, among the 11 factors considered to be affecting the probability of adverse effect of climate change as problem poultry farmers, only two factors, farmers' location of Ekiti State dummy and type of poultry system are significant at 10% and 5% with the coefficients of -0.506 and 0.497 respectively. Going by the sign of the coefficient, poultry farmers in Ekiti State have lower probability of facing adverse effect of climate change than their counterparts in Lagos and Ondo State. This may not be unconnected with the geographical location of the states. It is noteworthy that Ekiti State is not a coastal area but Lagos and Ondo States are littoral states bounded in the south by the Atlantic Ocean. Paice and Chambers (2020) reported that air temperature is higher and more frequent in coastal areas.

Also, poultry farmers using the battery cage system have higher probability of facing adverse effect of climate change, chiefly high temperature, as a problem, as shown by the positive sign of the coefficient of 0.497. Conversely, farmers using deep litter are less likely to be experiencing adverse effect of climate change. This is due to the deep litter having the capacity to provide extra insulation in colder temperatures and extra heat from the decomposing litter. According to Liverpool-Tasie, Sanou & Tambo (2019) the more the number of times litter is changed and pen is cleaned during heat period, the less the build-up of heat on the farm; as chicken waste accumulation declines leading to reduction in methane production which exposed birds to higher temperatures in pens.



**Table 1: Socio-Economic Characteristics Of Respondents**

Characteristic	Frequency	Per cent
<b>Gender:</b>		
Male	235	76.55
Female	72	23.45
Total	307	100.00
<b>Marital Status:</b>		
Single	111	36.16
Married	196	63.84
Total	307	100.00
<b>Main Occupation:</b>		
Farming	211	68.73
Non-farming	96	31.27
Total	307	100.00
<b>Age (years)</b>		
≤ 20	2	0.65
21 – 30	97	31.60
31 – 40	110	35.83
41 – 50	50	16.29
51 – 60	39	12.70
≥ 61	9	2.93
Total	307	100.00
<b>Membership of Cooperative:</b>		
Membership	206	67.10
Non-membership	101	32.90
Total	307	100.00
<b>Type of Production method:</b>		
Deep litter	48	15.64
Battery cage	259	84.36
Total	307	100.00
<b>Poultry farming experience (years):</b>		
< 1	2	0.65
1 – 6	201	65.47
7 – 12	73	23.78
13 – 18	5	1.63
19 – 24	9	2.93
25 – 30	11	3.58
> 30	6	1.95
Total	307	100.00

Source: Field Survey (2019)

### 3.2.2 Disease Incidence, High Cost of Transportation and Feeds as Problems among the Poultry Farmers

For disease incidence, according to Table 2, only the coefficients of membership of socio-group and farming experience of -0.705 and -0.035 respectively are significant at 1% and 10% respectively. These means that being a member of a socio-economic group reduces the probability of farmers having disease incidence as a problem and that an increase in the years of experience of farmers declines their probability of facing disease incidence as production limiting factor. Through socio-economic group, farmers have the opportunity of sharing knowledge on poultry management that include disease prevention and control. In addition, farmers acquire more skills on disease prevention and control as year of experience increases.

From the regression results on high cost of transportation as shown in table 2, only membership of cooperative is significant at 1% level with a coefficient of -0.525. This indicates that farmers that are members of cooperative, a socio-economic group, have lower probability of having high cost of transportation as a problem than their counterparts, those that are not members of socio-economic group. This reason for this is that with group membership, farmers can easily buy inputs in bulk as a group and distribute according to individual farmer's purchase bookings.

**Table 2: Regression Results of the Effects of Socio-Economic Features of Poultry Farmers on Selected Production Limiting Factors or Problems.**

Factors	Climate Change adverse effect	Disease incidence	High of- transportation Cost	High cost of feeds Cost	High cost of drugs
	Coefficient (P>/z/)	Coefficient (P>/z/)	Coefficient (P>/z/)	Coefficient (P>/z/)	Coefficient (P>/z/)
Age (X <sub>1</sub> )	0.067 (0.315)	0.084 (0.144)	0.069 (0.176)	0.061 (0.261)	0.156 (0.014)**
Age Square (X <sub>1</sub> <sup>2</sup> )	-0.001 (0.202)	-0.001 (0.256)	-0.001 (0.256)	-0.001 (0.340)	-0.002 (0.018)**
Farmer's Household Size (X <sub>2</sub> )	0.039 (0.554)	-0.003 (0.965)	0.038 (0.470)	0.026 (0.647)	0.043 (0.427)
Farmer's Formal Education (X <sub>3</sub> )	-0.150 (0.199)	0.060 (0.512)	0.081 (0.310)	0.098 (0.253)	0.108 (0.193)
Farmer's Gender (X <sub>4</sub> )	0.404 (0.169)	0.330 (0.159)	-0.128 (0.511)	-0.013 (0.951)	-0.063 (0.752)
Farmer's Marital Status (X <sub>5</sub> )	0.217 (0.480)	-0.136 (0.592)	-0.312 (0.178)	-0.126 (0.611)	-0.205 (0.389)
Main Occupational Group (X <sub>6</sub> )	0.049 (0.833)	0.300 (0.160)	0.339 (0.067)	0.400 (0.052)	0.402 (0.033)*
Membership of Cooperative (X <sub>7</sub> )	-0.395 (0.089)	-0.705 (0.001)***	-0.525 (0.003)***	-0.726 (0.000)***	-0.326 (0.066)

Factors	Climate Change adverse effect	Disease incidences	High of- transportation Cost	High cost of feeds Cost	High cost of drugs
	Coefficient (P>/z/)	Coefficient (P>/z/)	Coefficient (P>/z/)	Coefficient (P>/z/)	Coefficient (P>/z/)
Farmer's location (X <sub>8</sub> ) - Lagos State Dummy	0.141 (0.647)	-0.220 (0.328)	-0.144 (0.479)	0.113 (0.605)	0.023 (0.912)
Farmer's -location (X <sub>9</sub> ) - Ekiti State Dummy	-0.506 (0.044)*	-0.127 (0.573)	-0.162 (0.420)	0.030 (0.890)	-0.117 (0.561)
Poultry System (X <sub>10</sub> )	0.497 (0.025)**	-0.114 (0.566)	-0.037 (0.838)	0.024 (0.899)	-0.083 (0.646)
Farming experience (X <sub>11</sub> )	0.005 (0.779)	-0.035 (0.033)*	-0.021 (0.137)	-0.028 (0.081)	-0.019 (0.208)
Constant	0.241 (0.861)	-0.441 (0.717)	-0.719 (0.511)	-0.431 (0.712)	-2.707 (0.044)
Model Features:					
Loglikelihood	-91.441	-135.976	-170.494	-144.221	-164.408
No. of Observation	307	307	307	307	307
LR Chi Square (12)	26.64	34.18	25.03	31.14	29.52
Prob > Chi Square	0.009	0.001	0.015	0.002	0.003
Pseudo R-Square	0.127	0.112	0.068	0.097	0.082

Level of Significant: \*Significant at 10% \*\*Significant at 5% \*\*\*Significant at 1%

Source: Field Survey (2019)

This will accord the poultry farmers lower unit cost of transportation for all inputs purchased in bulk, which would not have been possible individually as the farmers are mostly small to medium scale farmers.

Similarly, on high cost of feeds, only the coefficient of membership of socio-economic group is significant at 1% level with the value -0.726. This implies that farmers that are members of socio-economic group have lower probability of having high cost of feeds as a production challenge if compared with those that are not members of socio-economic group. Through socio-group, farmers do interact and exchange information on available poultry feeds, their sources and where to get the feeds at cheaper cost. Farmers do teach one another how to compound feeds that can serve the farm profitably. Farmers can also buy as a group to take advantage of reduced unit cost through bulk purchase. This is line with Alho (2015) and Shiferaw & Muricho (2011) that membership of cooperative enhances farmers access to input and output markets.



**3.2.3 High cost of drugs as problem among the poultry farmers:** Also from table 2, among all the variables considered to explain the variation of high cost of drugs as a problem among the poultry farmers, age and main occupation of farmers with coefficients of 0.156 and 0.402 are the only significant variables at 5% and 10% levels respectively. An increase in age of farmers increases the probability of the farmers having high cost of drugs as problem. However, considering age square that has negative coefficient of -0.002 and significant at 5% level, older farmers are less likely to have high cost of drugs as problem. More attention would need to be given to younger farmer who are less experienced in drug procurement.

Moreover, a respondent having poultry farming as main occupation increases the probability of having high cost of drugs as production problem. A farmer that is into poultry farming, as main occupation, will incur more cost on drugs due to higher scale and frequency of operation than farmers that engage in poultry farming on part-time basis or as secondary source of income.

#### 4. CONCLUSION

The study reveals that majority of the poultry farmers are male and adults with varying level of farming experience and a number of production limiting factors are confronting poultry farmers in southwest Nigeria. The poultry production problems of the farmers considered in the study are adverse effect of climate change that breeds warmer temperature, disease incidence, high cost of transportation, high feeds cost and high cost of drugs. The study shows that these challenges vary among the farmer along their socio-economic features. Farmers in Ekiti State have lower likelihood of facing the problem of climate change than those in the other two littoral states, Ondo and Lagos. Similarly, farmers using battery cage system have higher likelihood of facing adverse effect of climate change, such as higher temperature, than the farmers using deep litter system.

The likelihood of having disease incidence declines with membership of socio-group and increase in years of experience among the poultry farmers. In addition, poultry farmers that are members of socio-economic group, like cooperative, are less likely to have high transportation cost and high cost of feeds as problems. Though the probability of having high cost of drugs as production problem increases with age of farmers, older farmers are less likely to have the problem and farmers that have poultry production as main occupation have higher probability of having high cost of drugs than those that are into poultry farming as secondary occupation. From the study, deep litter system of production should be encouraged among poultry farmers to reduce the adverse effects of climate change, most especially higher temperature.

Poultry farmers in the coastal states, Ondo and Lagos, should be aware that they are more prone to the adverse effect of climate change than those in Ekiti state for necessary mitigating measures. Cooperative membership should be encouraged among the poultry farmers to reduce transportation cost and disease incidence on farms. Also, poultry drug related assistance should be given to the farmers that engage in the enterprise as main occupation; this requires identifying poultry farmers that are into the enterprise as main occupation in the sub-region and given priority over those that are into poultry production as secondary occupation. Similar study should be conducted to establish the relationship between farmers' socio-economic features and the impact of pandemic on their business.



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