# Determinants of Participation of Small Scale Commercial Poultry Farmers in Agricultural Insurance Scheme in Kwara State, Nigeria

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**Abstract**  Risks and uncertainties associated with poultry enterprises is great to an extent of undermined the productivity and sustainability of the sector by reducing the availability of institutional credit for investment in agriculture. This study was carried out to determine the factors influencing the level of poultry farmers' participation in agricultural insurance scheme in Kwara State, Nigeria. A multistage sampling procedure was employed to select a sample size of 150 farmers and structured questionnaire was used to elicit data from the farmers. The data collected from the farmers was analysed using descriptive statistics and logit regression model. The findings revealed that 74% of the farmers were aware of the existence of Agricultural insurance scheme but only 32.7% of the farmers participated in the agricultural insurance scheme. The logit regression showed that age, educational level, farm size and accessibility to credit were significant variables that influenced the probability of participation of the farmers in agricultural insurance scheme while household size, membership of association and contacts with extension agents were found to be insignificant in influencing the farmers' participation in agricultural insurance scheme. The major challenge faced by farmers in the course of their participation in agricultural insurance schemes was delay in indemnity payment. It is recommended that effective service delivery by insurance service providers will ensure continuity of farmers' participation in agricultural insurance and also participation by farmers who are yet to participate.

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## 1. Introduction

Poultry farming is one of the leading enterprises in Nigeria Agricultural sector. It has gained acceptance among the citizens of almost all the regions in Nigeria due to the prolific instincts and short-term rate of returns in forms of cash and kind benefits [1]. Unfortunately, many risks and uncertainties are involved as to all forms of enterprises. Risk may be defined as the potential deviation between expected and real outcomes. While the deviation may be positive or negative, a negative outcome has greater importance from practical point of view and is usually the focus in decision-makers [2]. Farmers face a number of risks which are often interconnected. Six types of risk are generally considered in agricultural enterprises, according to their sources: production risks, price and market risks, regulatory risks, technological risks, financial risks, and human resources risks [2,3]. Risk management in agriculture is important on several

grounds: even if reducing farming risk does not always improve farmers' welfare, failure to manage risks has direct repercussions on farmers' incomes, market stability and potentially food security. Nigerian farmers are increasingly faced with risk factors such as droughts, floods, diseases, pests, windstorms, accidents, fire, theft, damage and several other unplanned events whose occurrence cannot be readily predicted and therefore, poses serious threat to the success of farming enterprise in Nigeria [4,5] opined that since farmers cannot predict the probability of occurrence of any of these and cannot bear these risks and uncertainties alone, they are faced with the option of transferring or sharing the risks involved in the day-to-day management of their farms with one or more individuals or firms. In view of the risks and uncertainties of Agricultural production in Nigeria, the federal government of Nigeria launched the Nigerian Agricultural Insurance Scheme (NAIS) on the 15th December 1987 and Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL) on June, 2011 as part of governments' efforts to enhance food production in

Nigeria. Agricultural insurance looks into how risks and uncertainties can be effectively managed to the advantage of the farmers in the present and also in the future. Thou an insurance policy is not a method of risk transfer, it is only a document confirming the existing of the insurance cover. The insurance is a method, an economic device through which risk is transferred to the insurance company and then distributed onto the group of insured people or entities. This can help in stabilizing agriculture and in turn the economy at large. Agricultural insurance is therefore a necessary part of the institutional infrastructure essential for the development of agriculture, which is mainly a high risk enterprise. Also, to control lending environment for banks in which the agricultural value chain is well structured as it was realized that most efforts to promote food production have not yielded much results due largely to incidents of incremental weather conditions and the effects of natural hazards like flood, drought, fire, pests and diseases [6,7].

The National Agricultural Extension and Research Liaison Services [7] identified the following as the benefits of agricultural insurance to farmers: (a) it protects farmers against financial disaster after suffering any of the insured risks for which indemnity (compensation) is paid. The farmer is not only able to continue in business but also the stability of his income is enhanced; (b) agricultural insurance empowers the farmers to obtain farm credit. Since insurance guarantees protection against crop and/or livestock failure, the insured farmer has greater confidence in obtaining loans; (c) it facilitates better planning and project implementation since there is a high level assurance for continuity in business; (d) it serves as an assurance to banks and other financial institutions who grant loan for agricultural purposes that loans given will be repaid; and (e) it build farmers confidence in using new technologies and making greater investments in agriculture Recognizing the benefits of agricultural insurance, the Nigerian Government in 1987 established the Nigerian Agricultural Insurance Scheme (NAIS) with the following objectives: (1) to provide relief or compensation to farmers in the event of crop or livestock losses resulting from natural disasters; (2) to encourage the provision of credit by financial institutions to farmers since agricultural insurance contract policies would be accepted as collaterals by them; (3) to minimize or eliminate the need for emergency assistance provided by government during agricultural disasters; (4) to promote agricultural production by encouraging the adoption of new and improved farming technologies and in making greater investments in the agricultural industry; and (5) to reduce unemployment or underemployment amongst farmers to the extent of which crop and livestock failures are contributing factors. According to [8], the NAIS to date covers a wide range of crops and livestock enterprises such as: maize, rice, yam, cassava, millet, groundnut, wheat, sorghum, cattle, pigs, sheep, goat, and poultry. The premium on insurance cases for these crops and livestock are subsidized at 50% by the government. The scheme is designed for all classes of farmers, namely small, medium and large-scale. The poultry industry in Nigeria has suffered a great deal of losses, which affect poultry farmers as well as poultry consumers [9]. Birds in general are prone to disease attack. A single attack can wipe out thousands of birds or even the entire farm. A case in point was the attack on the poultry industry in Nigeria by avian influenza in 2006. According to [10] the attack which almost closed the poultry industry in Nigeria claimed 44,000 layers, 32,000 broilers, 25 geese and 5 turkeys in Kaduna State. In Kano State, 43,000 layers, 15 broilers, 43 ducks, 28 geese, 20 turkeys and 2 ostriches were eliminated and in Katsina State 41,000 layers and broilers, 28,000 turkeys, 12 geese and 1 ostrich were killed. In a situation like this, insurance remains the only option to assist the farmers to go back to business.

Agricultural insurance policy is one of the notable methods by which farmers can share or transfer the risks and uncertainties associated with their farming enterprise as it encourages them to make greater investment in agricultural production, promotes their confidence in venturing into adoption of new and improved farming practices, enhances their accessibility to credit by financial institutions as the insurance cover as an added collateral and ultimately provide financial support to farmers in the form of indemnity which ensures continuity of their farming enterprise. Although insurance scheme exists in Nigeria, it covers less than 1% of the total population of farmers [4]. According to [11], Nigerian farmers are not very excited about taking an insurance policy. This can be traced to the less than satisfactory image of the insurance industry regarding loss compensations, and this problem has created mixed feelings towards agricultural insurance by prospective farmers and hence, the farmers become reluctant in their willingness to take an insurance cover; and also considering the very low incomes, the small sizes of holdings aimed at subsistence production, large scale ignorance and poverty and the adverse view of other people's experiences with activities of insurance companies in other sectors, peasant farmers are generally reluctant to patronize the insurance market, let alone willingly forgo a small payment in the form of premiums in exchange for their farm risks [12].

Despite the existence of insurance services rendered by Nigerian Agricultural Insurance Corporation and other private firms in Nigeria, there has been a low level of participation of farmers buying insurance premium and in view of this, there is the need to examine the level of awareness of farmers about agricultural insurance scheme and the factors influencing farmers' willingness to participate in agricultural insurance scheme. Therefore, the specific objectives of this study are: to examine the level of awareness and participation of poultry farmers' in agricultural insurance scheme; to determine the factors influencing poultry farmers' participation in agricultural insurance scheme; and to ascertain the constraints encountered by poultry farmers in participating in agricultural insurance scheme.

## 2. Materials and Methods

### 2.1. Study Area

The study was carried out in Kwara state, one of the six States in North Central region of Nigeria. The State has sixteen Local Government Areas (LGAs) which covers an area of 74,256sq km of the total area of Nigeria (923,768sq km, approximately one-twelfth). In the State, there are 247,975 farm families with 254,242 hectare of

cropped area. The State lies between latitude $7^0 45$'N and $9^0 30$'N and longitudes $2^0 30$'E and $6^0 35$'E. The annual rainfall pattern across the State extends between the month of April and October with minimum (600-1,500mm) with peak rains in May to June and September to October. The months of November to February are virtually without rainfall and the mean temperatures ranges from $20^0$C to $22^0$C. Humidity ranges from 50% in dry season and up to 85% in the wet season. The State is bordered in the north by Niger State, in the south by Oyo, Osun and Ekiti States, in the east by Kogi State and in the west by Benin Republic. Because of its unique geographical position, the State is referred to as the "gateway" between the north and the south of the country.

Agriculture is the main stay of the economy and the main crops are: sweetpotato, cassava, yam, cowpea, groundnut, maize, sorghum, wheat, melon, kola nut, sheanut, tobacco, benseed, palm produce, okro, melon, pepper, some leafy vegetables and livestock reared include poultry, goats, sheep and cattle, fishing is also prominent along the lower River Niger Basin [13]. The prevailing agricultural system combines bush fallow and mixed cropping with emphasis on subsistent farming, while some farmers engage in craft activities such as weaving, blacksmithing, bricklaying, carpentry and welding. Kwara State population is heterogeneous, attracting different ethnic groups including the Yoruba, Nupe, Baruba, Fulani and Hausa. The major ethnic groups in the State are the Yorubas and their language is widely spoken across the State.

## 2.2. Population, Sampling Procedure and Sample Size

The sixteen (16) LGAs were classified by Agricultural Development project (ADP) into four (A, B, C and D) Agricultural zones, 23 blocks and 184 cells [13]. Multistage random sampling technique was employed to select 150 poultry farmers which account for 10% of poultry farmers' household in the study area. Firstly, a purposive sampling technique was used to select zone C which comprises of 5 LGAs (Ilorin West, Ilorin East, Ilorin South, Moro, and Asa LGAs). Secondly, three LGAs (Ilorin West, Ilorin East and Ilorin South) was chosen based on predominance of registered poultry farmers as contained in the information from Poultry Association of Nigeria (PAN), Kwara State chapter. These three LGAs have the highest percentage share of poultry farmers in the state. A stratified random sampling technique was adopted in selecting 50 registered poultry farmers from each LGA to make up a total sample size of 150 respondents.

## 2.3. Research Instrument

Majority of the respondents are semi-illiterates; hence a structured interview schedule was used to collect information on personal and socio-economic characteristics from sampled poultry farmers.

## 2.4. Methods of Data Analysis

Primary data were employed in this study and the data was collected using a well structured questionnaire. The information obtained from the farmers include their socioeconomic characteristics such as farming experience,

household size, educational status, farm size, sex, marital status and membership of associations, information on level of awareness of insurance and information on the constraints encountered by the farmers in the process of participation in insurance scheme. Descriptive and inferential statistics was used for data analysis. The descriptive statistic was used to examine the level of farmers' awareness and participation in Agricultural insurance scheme and to ascertain the constraints encountered by farmers in participating in Agricultural insurance scheme, while inferential statistic used the logit regression model to determine the factors influencing farmers willingness to participate in Agricultural insurance scheme.

## 2.5. Analytical Framework

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. This was used to determine the factors affecting farmers' participation in agriculture insurance scheme. There are two reason for choosing Logit model for this study instead of linear probability and probit models according to [14]. 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 [15], it is expressed as:

$$P_i = E\left(Y = 1 / X_1\right) = \beta_1 + \beta_2 X_2 + \beta_3 Xi \qquad (1)$$

For ease of estimation, equation (1) is further expressed as:

$$P_i = \frac{1}{1 + e^{-z_i}} = \frac{e^z}{1 + e^z} \qquad (2)$$

Where: $P_i$ = Probability of an event occurring

$$Z_i = \beta_1 + \beta_2 X_i$$

The empirical model of the logistic regression for this study assumed that the probability of the farmers' participation in Agricultural insurance scheme is expressed as:

$$P_i = \frac{e^{\left(\begin{array}{c} b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 \\ + b_4 X_4 + ... + b_7 X_7 \end{array}\right)}}{1 + e^{\left(\begin{array}{c} b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 \\ + b_4 X_4 + ... + b_7 X_7 \end{array}\right)}} \qquad (3)$$

$P_i$ 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:

$$Z_i = \ln\left(\frac{P_i}{1 - P_i}\right)$$
$$= b_0 + b_1 X_1 + b_2 X_2 + ... + b_7 X_7 + u \qquad (4)$$

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 was expressed as:

$$Y = b_0 + b_1 X_1 + b_2 X_2 + b_3 X_3 \\ + b_4 X_4 + ... + b_7 X_7 + u \qquad (5)$$

Where: Y = dichotomous response variable (1 for farmers who participated in Agricultural insurance scheme; 0 otherwise)

$X_1$ = Age of farmers (Years)

$X_2$ = Educational level of farmers (years of schooling)

$X_3$ = Farm size of farmers (hectares)

$X_4$ = Household size (number)

$X_5$ = Membership of associations (number of associations a farmer belongs to)

$X_6$ = Accessibility to credit (amount of loans a farmer accessed)

$X_7$ = Contact with extension agents (number of contacts)

$b_1 - b_2$ = coefficients of stimulus variables

$b_0$ = constant term

$u$ = error term

# 3. Results and Discussion

## 3.1. Awareness and Participation of Poultry Farmers in Agricultural Insurance Scheme

Majority of the poultry farmers (74%) were aware of agricultural insurance scheme while 26% was not aware of the scheme as indicated in Table 1.

However, only half of those aware respondents (32.7%) participated in the insurance scheme as indicated in Table 2. Thus 67.3% of the farmers did not participate in the agricultural insurance scheme and this implies that the non - awareness of the agricultural insurance scheme by some of the respondents deprived them the opportunity of participating in the insurance scheme. Most of the farmers who participated in the Agricultural insurance scheme revealed that they were compelled to do so by the banks from whom they obtained agricultural loans.

**Table 1. Distribution of poultry farmers according to their awareness of Agricultural Insurance Scheme**

| Awareness | Number of Respondents | Percentage |
|---|---|---|
| Yes | 111 | 74.0 |
| No | 39 | 26.0 |
| Total | 150 | 100.0 |

**Source: Field survey, 2013**

## 3.2. Determinants of Poultry Farmers' Participation in Agricultural Insurance Scheme

The parameters of the logit regression model were estimated using Shazam statistical package. The Chi square statistic of 65.246 (p < 0.1) showed that the model gave a good fit for the analysis. The result of the logit regression in Table 3 shows that Age, Educational level and Accessibility to credit were significant variables that influenced the participation of the farmers in agricultural insurance scheme at 10% significance level and also, farm size was a significant variable at 5% significance level.

**Table 2. Distribution of poultry farmers according to their participation in Agricultural Insurance Scheme**

| Participation | Number of Respondents | Percentage |
|---|---|---|
| Yes | 49 | 32.7 |
| No | 101 | 67.3 |
| Total | 150 | 100.0 |

**Source: Field survey, 2013**

**Table 3. Logit Regression Result**

| Variables | Coefficients | Z - Statistic | Exp (b) |
|---|---|---|---|
| Age ($X_1$) | -2.424 (1.143) | 2.120** | 0.086 |
| Educational level ($X_2$) | 0.507 (0.194) | 2.915** | 1.660 |
| Farm size ($X_3$) | 0.063 (0.032) | 1.650* | 1.065 |
| Household size ($X_4$) | -0.460 (0.038) | 1.210 | 0.631 |
| Membership of association ($X_5$) | 1.957 (1.260) | 1.553 | 7.078 |
| Accessibility to credit ($X_6$) | 0.568 (0.197) | 2.877** | 1.765 |
| Contacts with extension agents ($X_7$) | -0.783 (0.640) | 1.212 | 0.457 |

**Source: Field survey, 2013**

Nagelkere R-squared (R2)  87%
-2log likelihood  97.245
Chi square (X2)  65.246

**Note: *P < 0.1 **p < 0.05 Values in parentheses = Standard errors**

Household size, membership of association and contacts with extension agents were found to be insignificant in influencing the farmers' participation in agricultural insurance scheme. The coefficient of age of the farmers which was found to be negative and significant at 10% implies that the older the farmers, the lower their participation in agricultural insurance scheme and this could be largely due to less receptivity of older farmers to innovation unlike young educated farmers who have high receptivity to innovation. This result is consistent with the result of similar study by [16] in revenue insurance purchase decisions of farmers that the older they are the less innovative they are in their operational decision. The coefficient of educational level of the farmers was found to be positive and significant at 10% and this conforms to the *a priori* expectation that the higher the educational level of farmers, the higher their participation in agricultural insurance scheme. The coefficient of accessibility to credit by the farmers was found to be positive and significant at 5% implying that the higher the access to credit by the farmers, the higher their participation in agricultural insurance; which was evident in the response of most farmers that access to loans from banks is better facilitated when they have insurance cover and therefore, they subscribe to insurance scheme so as to increase their accessibility to loans.

## 3.3. Constraints Encountered by Poultry Farmers in Their Participation in Agricultural Insurance Scheme

The major problem encountered by the farmers under Agricultural insurance scheme is that of delay in indemnity and is ranked first. The payment of indemnity

by insurance companies was indicated to be untimely and inadequate by most of the farmers and this affected their perception of Agricultural insurance scheme as they tend to believe that insurance companies are only interested in collecting premium and not paying indemnity when due. Administrative bottlenecks which stems from excessive bureaucracy is ranked second as a constraint faced by farmers in participating in agricultural insurance and this constraint has the tendency of making the farmers withdraw from insurance scheme because of the excessive bureaucratic processes in the operation of insurance. Untimely assessment of losses by insurance companies is ranked as the third problem faced by the farmers in their participation in insurance scheme. The other constraints encountered by the farmers as shown in Table 4 are rigorous procedures in claim settlement, inaccessibility to insurance personnel and inadequate information dissemination.

**Table 4. Distribution of Poultry Farmers According to their Challenges in Participating in Agricultural Insurance Scheme**

| Constraints | *Nos. of Respondents | Percentage | Rank |
|---|---|---|---|
| Delay in indemnity payment | 105.00 | 21.9 | 1st |
| Administrative bottlenecks | 92.00 | 19.2 | 2nd |
| Delay in assessment of losses | 80.00 | 16.7 | 3rd |
| Rigorous procedures in claim settlement | 78.00 | 16.3 | 4th |
| Inaccessibility to insurance personnel | 64.00 | 13.3 | 5th |
| Inadequate information dissemination | 61.00 | 12.7 | 6th |

**Source: Field survey, 2013**
**\*Insurance Scheme (Multiple Responses n = 150)**

## 4. Conclusion

The findings of this study showed that majority of the respondents (74%) was aware of Agricultural insurance scheme but only 32.7% of the respondents participated in insurance Agricultural scheme. The result of the logit regression analysis showed the coefficients of age, educational level and accessibility to credit were significant variables that influenced the participation of the farmers in Agricultural insurance scheme at 10% level of significant and also, farm size was a significant variable at 5% level of significant while household size, membership of association and contacts with extension agents were found to be insignificant in influencing the farmers' participation in Agricultural insurance scheme. The major challenges faced by farmers in the course of their participation in Agricultural insurance were delay in indemnity payment, administrative bottlenecks, delay in assessment of losses, rigorous procedures in claim settlement, accessibility to insurance personnel and inadequate information dissemination. It is recommended that to ensure continuity of farmers participation in Agricultural insurance and also participation by farmers who are yet to participate, there is the need for proper

sensitization of farmers on the importance of insurance policy by Government, non – governmental agro services providers and insurance corporations; and also the insurance corporations should ensure prompt delivery of their services to farmers by endeavouring to keep religiously to contractual arrangements. Also, government should make agricultural insurance more affordable to poultry farmers by increasing the present level of subsidy granted for agricultural insurance cover. Lastly, a special loan scheme for poultry farmers should be established by government to enable the farmers cope with the financial requirement involved in taking an agricultural insurance cover.

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