

## Determinants of Poultry Farmers' Willingness to Participate in National Agricultural Insurance Scheme in Oyo State, Nigeria

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### ABSTRACT

*Poultry enterprise development in Nigeria is affected by high cost of feeds and feed ingredients, outbreak of diseases, constrained smallholder access to inputs, climate change and marketing. This study examined the determinants of poultry farmers' willingness to participate in National Agricultural Insurance Scheme (NAIS) in Oyo State, Nigeria. Primary data were collected from 136 respondents with the aid of structured questionnaire using multi-stage sampling techniques. Data were analyzed with descriptive statistics and Probit regression model. Results showed that the mean age of the respondents was 43.6 years while the majority of them (65.44%) were males and had tertiary education (58.8%). Mean years of experience in poultry farming stood at 13.5, while the mean value of stock of birds held was ₦1,984,660.61. The majorities of the farmers (60.29%) belong to at least one association, had access to credit (60.29%) and were not aware of NAIS (70.58%). Willingness to participate in the scheme increased significantly with experience in poultry enterprise (0.9828), awareness status (1.0031), access to credit (0.0018), and value of stock held (5.48e-07), but decreased with membership of association (0.1113). It was recommended that more awareness about the scheme should be created. Also, credit facilities should be made available to farmers at affordable rate.*

**Key words:** Willingness to participate, agricultural insurance scheme, poultry farmers, Oyo State, Nigeria

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### INTRODUCTION

The agricultural sector in Nigeria is the next important economic activity after oil, and the single largest employer of labour force, employing about 70% of the country's workforce (USDA, 2013; NBS, 2014). It contributed about 40.07% in 2010 and 22% in 2014 of Gross Domestic Product (GDP) (pre and post debasing respectively) (NBS, 2014). Agriculture is made up of four sub-sectors, namely: crop production, livestock, forestry and fishing. The proportion of each sub-sector in the agricultural sector are; Crops (87.53%), Livestock (8.89%), Fisheries (2.42%) and Forestry (1.13%) in 2015 (NBS, 2016). The Nigeria's livestock population consists of 16.3 million cattle; 40.8 million goats; 27 million sheep; 3.7 million pigs and 151 million poultry (Nasiru *et al.*, 2012). Going by this figure, poultry alone constitutes more than 60% of the total livestock population, indicating the dominance of poultry sub-sector in the livestock industry.

Poultry can be described as birds of economic value to man which provide meat and eggs. Meat production requires the use of fast growing birds that can convert feed to meat quickly in order to attain market weight early, while egg production requires using good laying birds to produce eggs (Ogunlade and Adebayo, 2009). The most important poultry species is the domestic fowl or chicken because it is readily available and offers nutritional delicacy. Turkey, duck, guinea fowl, goose and pigeon are other examples of birds grouped under poultry. The poultry industry plays important roles in the development of Nigerian economy. It serves as 'safety net' providing ready cash in emergency needs. Its role in rural livelihoods and food security is enormous. The industry provides employment opportunity for the populace, thereby serving as a source of income to the people. Also, it provides a good source of animal protein in meat and eggs which have a high nutritional value (Abedullah *et al.*,

2007; Nasiru *et al.*, 2012). Poultry meat (chicken) and eggs are palatable and generally acceptable with little or no cultural and religious boundaries in Nigeria. Chicken and egg contribute to a nutritious, balanced diet, which is especially important for children, pregnant and nursing mothers as well as people who are ill (Ahlers *et al.*, 2009). Egg is an excellent source of iron, zinc and vitamin A, all of which are essential for health, growth and well-being; egg is a complete protein with excellent quality (Tijani *et al.*, 2006).

The Agricultural sector is subject to risks and uncertainties arising principally from the effects of natural hazards such as drought, flood, fire, windstorm, lightning, pests and diseases. Virtually all the sub-sectors of agriculture including poultry are faced with these risks and uncertainties. The several challenges facing the poultry industry make it very difficult for expansion, while new producers find it hard to start a business. Such challenges include; high cost of feeds and feed ingredients, outbreak of diseases, constrained smallholder access to inputs, climate change and marketing problems. The poultry industry in Nigeria has suffered a great deal of losses, which has affected both farmers and consumers (Ogoke, 1990). 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 which has forced many small and medium scale poultry farms to close down. In a situation like this, insurance remains the only option to assist the farmers to go back to business. In general, insurance is a form of risk management used to hedge against a contingent loss

In recognition of the need for special supportive programme for agricultural development that addresses the fundamental problems of risks and uncertainties, the National Agricultural Insurance Scheme (NAIS) was launched in 1987 but took off in 1989 and the Nigerian Agricultural Insurance Corporation (NAIC) was subsequently established to manage it. Agricultural Insurance is a special line of property insurance applied to agricultural firms. In fact, the underlying theory justifying the institution of NAIS is that risks mitigation in the agricultural sector will stimulate its performance. This will be achieved by meeting the persistent demand by lending institutions and the Nigerian farmers for appropriate risks aversion measures. The major objective of the scheme was to reduce the impact of risks and uncertainties to an acceptable minimum. It was also intended to promote agricultural production by minimizing or eliminating the need for ad hoc assistance previously provided to farmers by governments during agricultural disasters. By the decree establishing it, the scheme is permitted to bear losses of up to 200% of its premium income (Epetimehin, 2011).

Despite the existence of insurance services rendered by NAIC and other private insurance firms in Nigeria, there has been a low level of participation of farmers buying insurance premium (Eleri *et al.*, 2012). In view of this, there is the need to examine the level of awareness of farmers about NAIS and the determinants of farmers' willingness to participate in the scheme, taking poultry farmers as the case study. Although researchers such as Farayola *et al.*, (2013), Babalola (2014), Akintunde (2015) have worked on poultry farmers' willingness to participate in agricultural insurance scheme, information from available literature indicates that no such research has been conducted in Oyo State. Akintunde (2015) carried out the study in Osun and Oyo States and covered only poultry egg farmers. This study distinguished itself from Akintunde (2015) by covering poultry farmers (layers and broilers) in Oyo State. According to Omodele and Okere (2014), Oyo State is one of the States in the country with high concentration of commercial poultry production. This study therefore examined the determinants of poultry farmers' willingness to participate in NAIS in Oyo State, Nigeria, with the intention of providing policy makers and implementers with practical tools for effective implementation and promotion of agricultural insurance programmes.

## METHODOLOGY

### *Study area*

The study was carried out in Oyo State. Oyo State is one of the 36 States of the Federal Republic of Nigeria with headquarters in Ibadan. It has a land area of 27,249 km<sup>2</sup> (Fajuyigbe *et al.*, 2007). The 2006 official population census for the State was 5,591,589 (NBS, 2009). For administrative convenience, Oyo State is divided into five geographical zones; Ibadan, Oke - Ogun, Ogbomoso, Oyo and Ibarapa (Oyo state Government, undated). Each of these zones is divided into: 11, 10, 5, 4 and 3 Local Government Areas (LGAs) respectively, resulting into 33 LGAs in the State. Nearly all of the 270 ethnic groups constituting the Nigerian nation are found in Oyo State making it a microcosm of Nigeria. The State is bounded in the north by Kwara State, in the south by Ogun State, in the east by Osun State, and in the west by Ogun State and by Republic of Benin. The vegetation pattern is that of rain forest in the south and guinea savannah in the north. Agriculture is the main occupation of the people resident in the State. Production of the major Nigerian food and cash crops is done all over the State. Animal husbandry, especially poultry production, is a common enterprise in all parts of the State especially in the areas characterized by savannah grassland. The types of poultry that are commonly reared in Oyo State are chickens, ducks, guinea fowls, turkeys, and pigeons. Those that are of commercial or economic importance however, are chickens and

turkeys, amongst which the chickens predominate (Adene and Oguntade, 2006).

**Data collection and sampling procedure**

The data used for this study were obtained from primary source in 2014. The data were collected through the use of structured questionnaire by trained enumerators. A multistage sampling techniques was employed in selecting representative sample. The first stage involved a purposive selection of Ibadan and Oyo out of the five geographical zones. At the second stage, four LGAs out of eleven from Ibadan zone and all the four LGAs from Oyo zone were purposively selected. The selected LGAs are Egbeda, Akinyele, Lagelu and Ona-Ara from Ibadan zone while Afijio, Atiba, Oyo East, and Oyo West were selected from Oyo zone. The zones and LGAs were selected because they were ranked as areas with high prevalence of poultry production in the area by Oyo State Agricultural Development Project (ADP). The list of poultry farmers in the area was compiled by enumerators under the supervision of the researchers using snow ball method. The third and final stage of the sampling was the random selection of respondents from each of the selected LGAs proportionate to size. A total of 150 commercial poultry farmers were sampled, but only 136 were with complete information useful for this study. Data were collected on the socio-economic characteristics of the poultry farmers, awareness about NAIS and what NAIS has to offer and willingness of farmers to participate in it. The data collected were analysed using descriptive statistics and Probit regression model.

**Probit Regression model**

Probit regression was used to analyze the data for factors determining poultry farmers' willingness to participate in NAIS. The model uses the cumulative normal distribution and can be presented implicitly as:

$$y_i = \alpha + \sum_{i=1}^N \beta_i X_i + e_i \dots \dots \dots 1$$

In this model, the willingness to participate in NAIS is a dichotomous dependent variable (yi) with the value of 1 if willing to participate and 0 if otherwise.  $\alpha$  = constant term,  $X_1 \dots \dots \dots X_N$  represent the independent variables ,  $\beta_i$  are parameters to be estimated and  $e_i$  is the error term.

The empirical model for poultry farmer's interest to participate in insurance policy is explicitly formulated as:

$$y_i = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 + \beta_8 X_8 + \beta_9 X_9 + \beta_{10} X_{10} + e_i \dots \dots \dots 2$$

Where:

- X<sub>1</sub> = Age of farmer
- X<sub>2</sub> = Educational level
- X<sub>3</sub> = Sex
- X<sub>4</sub> = Marital status
- X<sub>5</sub> = Experience in poultry farming
- X<sub>6</sub> = Awareness status
- X<sub>7</sub> = Membership of association
- X<sub>8</sub> = Access to credit
- X<sub>9</sub> = Access to extension education
- X<sub>10</sub> = Value of the poultry stock held

The *a priori* expectations of the independent variables are presented in Table 1.

**RESULTS AND DISCUSSION**

**Poultry farmers' socio-economic characteristics**

The result of descriptive statistics of respondents' socio-economic characteristics is presented in Table 2. About 14% of the poultry farmers in the study area were below the age of 30 years, while about 40% were older than 49 years with mean age of about 44 years. This means that the respondents were fairly old but still economically active. About 75% of the farmers were males. This may be attributed to the fact that poultry enterprise is a highly risky venture, labour intensive and characterized by uncertainties which in most cases can only be handled by men as noted by (Ironkwe and Ajayi, 2007). The findings concur with those of Babatunde *et al.* (2012) and Babalola (2014) who reported that the majority of poultry farmers in Nigeria were males. All the poultry farmers in the study area had formal education, with over 50% having tertiary education. This implies that there is high literacy level among poultry farmers in Oyo state. This is expected to have positive influence on their decision to participate in insurance policy as opined by (Fawole and Fasina, 2005; Mohammed and Ortmann, 2005). The findings concur with that of Babalola (2014) who reported a high literacy rate among poultry farmers in Nigeria.

Furthermore, the mean years of experience of poultry farmers in the study area was 13.5. This indicates that the respondents have stayed relatively long enough for them to have gained practical experience about some of the risks and uncertainties associated with poultry production. Given the high risks and uncertainties that poultry farming

is associated with, high literacy level coupled with farmers experience in poultry farming is expected to have positive impact on their decision to participate in NAIS. About 61% of the respondents had household size of between 3 and 5 people, with mean household size of 5. The mean household size in the study area is a little higher than the estimated national average of four (Alabi and Haruna, 2005). This study is in consonant with Otunaiya *et al.* (2015) who revealed that the average family size of poultry farmers in Ibadan, Oyo state was five. Close to 75% of the farmers belonged to one or more association such as Poultry Association of Nigeria and cooperative societies. This may however have a positive effect on their willingness to participate in NAIS because the two associations as well as others would be useful channels of informing and educating their members about government policies.

Less than 36% of the respondents had access to extension services. This may be responsible for the low adoption of

NAIS by the poultry farmers. Farayola *et al.*, (2013) and Babalola (2014) also reported low participation of poultry farmers in NAIS. The major pre-occupation of the extension worker is the education of farmers about government policies and their effects on their farming business. That the farmers were not adequately covered by the extension agents may be partly due to high farmer-extension worker ratio in the country. Muhammad *et al.* (2014), opined that access to extension services by farmers in Nigeria is poor. About 71% of the respondents were not aware of NAIS and what it entails, implying that the majority of the respondents were not aware of the scheme. Expectedly, farmers' awareness of NAIS would positively influence their decision to participate in it. This finding however contradicts the results of Farayola, *et al.* (2013), who reported that the majority of poultry farmers in Kwara State were aware of NAIS. About 41% of the poultry farmers held stocks that were worth between 1 million and 2 million Naira while only about 18% of them had stocks that were worth 3 million Naira or more.

**Table 1:** *a priori* expectation of the independent variables used in the determinants of poultry farmers' willingness to participate in NAIS

| Variable                         | Description | Measurement            | Expected sign | References  |
|----------------------------------|-------------|------------------------|---------------|---|
| Age                              | Continuous  | Years                  | -             | Oyinbo <i>et al.</i> , 2012   |
| Sex                              | Categorical | 1 if male, 0 otherwise | +/-           |   |
| Marital status                   | Categorical | 1 if male, 0 otherwise | +/-           | Danso- Abbeam <i>et al.</i> , 2014; Farayola <i>et al.</i> , 2013                           |
| Education                        | Continuous  | Years                  | +             | Danso- Abbeam <i>et al.</i> , 2014; Babalola 2014; Oyinbo <i>et al.</i> , 2012              |
| Household size                   | Continuous  | Number                 | +/-           | Danso- Abbeam <i>et al.</i> , 2014  |
| Experience in poultry enterprise | Categorical | 1 if male, 0 otherwise | +/-           | Danso- Abbeam <i>et al.</i> , 2014, Kouame & Koumenan 2012; Babalola, 2014; Akintunde, 2015 |
| Membership of association        | Categorical | 1 if yes, 0 otherwise  | +             |   |
| Access to credit                 | Categorical | 1 if yes, 0 otherwise  | +             | Olubiyo <i>et al.</i> , 2009; Oyinbo <i>et al.</i> , 2012; Farayola <i>et al.</i> , 2013    |
| Access to extension education    | Categorical | 1 if yes, 0 otherwise  | +             | Farayola <i>et al.</i> , 2013; Babalola, 2014; Akintunde, 2015                              |
| Awareness about the policy       | Categorical | 1 if yes, 0 otherwise  |               | Danso-Abbeam <i>et al.</i> , 2014; Babalola, 2014   |
| Value of the poultry stock       | Continuous  | Nigeria naira (₦)      | +             | Akintunde, 2015   |

Source: Authors' compilation from literature

**Table 2:** Socio-economic characteristics of the poultry farmers in Oyo State

| Variables                              | Frequency | Percentage | Mean         | Standard deviation |
|--|-----------|------------|--------------|--------------------|
| Age                                    |           |            | 43.63        | 11.3156            |
| <30                                    | 19        | 13.97      |              |                    |
| 30-39                                  | 25        | 18.38      |              |                    |
| 40-49                                  | 39        | 28.68      |              |                    |
| >49                                    | 53        | 38.97      |              |                    |
| Sex                                    |           |            |              |                    |
| Male                                   | 89        | 65.44      |              |                    |
| Female                                 | 47        | 34.56      |              |                    |
| Education                              |           |            |              |                    |
| No formal education                    | 0         | 0.00       |              |                    |
| Primary                                | 9         | 6.62       |              |                    |
| Secondary                              | 47        | 34.56      |              |                    |
| Polytechnic//NCE                       | 52        | 38.24      |              |                    |
| University graduate                    | 28        | 20.59      |              |                    |
| Years of experience in poultry farming |           |            | 13.46        | 8.2703             |
| <10                                    | 54        | 39.71      |              |                    |
| 10-19                                  | 39        | 28.68      |              |                    |
| >19                                    | 43        | 31.62      |              |                    |
| Household size                         |           |            | 4.81         | 1.9520             |
| <3                                     | 9         | 6.62       |              |                    |
| 3-5                                    | 83        | 61.03      |              |                    |
| >5                                     | 44        | 32.35      |              |                    |
| Other means of livelihood              |           |            |              |                    |
| Yes                                    | 120       | 88.23      |              |                    |
| No                                     | 16        | 11.76      |              |                    |
| Membership of association              |           |            |              |                    |
| Yes                                    | 100       | 73.53      |              |                    |
| No                                     | 36        | 26.47      |              |                    |
| Access to credit                       |           |            |              |                    |
| Yes                                    | 82        | 60.29      |              |                    |
| No                                     | 54        | 39.71      |              |                    |
| Access to extension services           |           |            |              |                    |
| Yes                                    | 48        | 35.29      |              |                    |
| No                                     | 88        | 64.71      |              |                    |
| Awareness status                       |           |            |              |                    |
| Yes                                    | 40        | 29.42      |              |                    |
| No                                     | 96        | 70.58      |              |                    |
| Value of poultry stock (₦)             |           |            | 1,984,660.61 | 1,111,268.00       |
| <1,000,000                             | 22        | 16.18      |              |                    |
| 1,000,000-1,999,999                    | 56        | 41.18      |              |                    |
| 2,000,000-2,999,999                    | 34        | 25.00      |              |                    |
| >2,999,999                             | 24        | 17.65      |              |                    |

Source: Authors' estimations from field survey, 2014

**Table 3:** Probit regression estimates of determinants of poultry farmers' willingness to participate in NAIS

| Variable                         | Coefficient | Std. Err. | P value  |
|----------------------------------|-------------|-----------|----------|
| Age                              | -0.0180     | 0.0225    | 0.423    |
| Education                        | 0.0391      | 0.0711    | 0.582    |
| Sex                              | -0.5221     | 0.3402    | 0.125    |
| Marital status                   | 0.0146      | 0.0293    | 0.619    |
| Experience in poultry enterprise | 0.9828      | 0.4422    | 0.026**  |
| Awareness status                 | 1.0031      | 0.5565    | 0.071*   |
| Membership of association        | -0.1113     | 0.0540    | 0.037**  |
| Access to credit                 | 0.0188      | 0.033     | 0.001*** |
| Access to extension education    | 0.2988      | 0.2993    | 0.318    |
| Value of poultry stock           | 5.48E-07    | 2.55E-07  | 0.032**  |
| Constant                         | 0.2369      | 0.0173    | 0.0840   |

Note: \*, \*\*, \*\*\* - Variable is significant at 10%, 5%, 1% respectively.

Source: Authors' estimations from field survey, 2014

### Determinants of poultry farmers' willingness to participate in NAIS

The results of the probit regression estimates of the determinants of poultry farmers' willingness to participate in NAIS are presented in Table 3. The statistical diagnostic test showed that the estimated model had a good fit with chi-square statistics significant at 1% level of significance. This implies that the variables specified in the model are relevant in explaining the participation decision of the respondents. Also, the Log-likelihood statistic ratio (LR) of 51.73 was significant, meaning that the independent variables included in the model jointly explained the probability of the poultry farmers' decision to participate in NAIS. Virtually all the included variables satisfied the *a priori* expectation as presented in Table 1, but the significant ones among them were experience in poultry enterprise, adequate awareness status, access to credit, value of poultry stock held by the farmers and membership of association.,

Experience in poultry enterprise (0.9828) was significant at 5% significance level and directly related to the probability of farmers being interested in NAIS. This may be due to the fact that farmers with greater number of years in poultry business might understand the effect of disasters on their businesses and standard of living better than their counterparts with less experience in the industry and are therefore more likely to be interested in NAIS. Also, they may have even suffered some kinds of disasters in the past and experience is the best teacher. This finding is in consonant with those of Danso-Abbeam *et al.* (2014), Kouame and Koumenan (2012) who showed a direct correlation between years of experience and probability of adopting new technology. However, this is in sharp contrast with that of Babalola (2014) who reported an indirect correlation between experience and probability of adoption of insurance scheme.

Another important determinant of poultry farmers' decision to participate in NAIS is adequate knowledge (awareness) of the scheme and its prospects. The results further revealed that awareness status (1.0031) is positively linked with probability of decision to participate in the scheme, and it is statistically significant at 10% confidence level. This is not surprising because awareness implies having some knowledge of the scheme and its economic importance. This observation confirms that information on any subject is key to decision making process. Babalola (2014) and Danso-Abbeam *et al.* (2014) indicated that awareness status and probability of decision to adopt new technology are positively related.

In addition, access to credit (0.0188) of the poultry farmers was directly correlated with probability of decision to participate in NAIS at 1% level of significance. The implication is that farmers that have access to credit are more likely to participate in the programme than their members who do not have access to credit. This was evident in the response of most farmers that access to loans from banks is better facilitated when they have insurance certificate and therefore, they subscribed to insurance scheme so as to increase their accessibility to loans. This concurs with the submission of (Olubiyo *et al.*, 2009; Oyinbo *et al.*, 2012; Farayola *et al.*, 2013). They all submitted that access to credit and decision to participate in the scheme were positively correlated.

It is also evident from Table 3 that the value of the birds kept (5.48E-07) is a strong determinant of poultry farmers' willingness to participate in NAIS. This variable is positively correlated with farmers' participation in the scheme, thus implying that farmers who invested more in their businesses have a higher probability of insuring their farms than their colleagues with lower levels of investments. This is understandable because, the farmer

that has invested heavily will want to insure the farm to prevent a situation whereby the whole investment will go down the drain in case of any disaster which is not uncommon with the poultry enterprise. Also, most of the large scale poultry farmers have access to credit facilities and they have to insure their farms as one of the conditions to obtain the loans. The result is consistent with the submissions of Akintunde (2015) and Danso-Abbeam *et al.* (2014) who reported that level of investment in agricultural enterprise and farmers' decision to participate in insurance scheme were directly related. It however contradicted the submission of Nimoh *et al.* (2011) who showed a negative relationship.

Finally, membership of association (0.1113) is negatively correlated with the probability that a poultry farmer will participate in NAIS at 5% level of significance. This implies that poultry farmers who are members of one association or the other are more likely not to participate in NAIS compared with their counterparts who do not belong to any association.

## CONCLUSION AND RECOMMENDATIONS

This study examined the determinants of poultry farmers' willingness to participate in National Agricultural Insurance Scheme. The results showed that years of experience in poultry enterprise, awareness status, access to credit and value of poultry stock held positively influenced poultry farmers' willingness to participate in agricultural insurance policy. Membership of association is the only negative determining factor. To ensure that poultry farmers participate in NAIS, there is the need for proper awareness creation about the scheme and what it stands for. The federal and state government should employ more extension workers to educate more farmers about the need to have agricultural insurance to safeguard their investments since agriculture is a risky business. Also, more credit facilities should be made available to poultry farmers through the Bank of Agriculture and other commercial banks at very low interest rates.

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