

## **Determinants of Farmers' Adoption of Agricultural Insurance: the Case of Poultry Farmers in Abeokuta Metropolis of Ogun State, Nigeria**

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**Abstract:** The study analyzed the determinants of poultry farmers' adoption of agricultural insurance in Abeokuta metropolis of Ogun state, Nigeria. The purposive sampling technique was used to select 80 poultry farmers for the study. Data collected with the use of questionnaire were analyzed using descriptive statistics and regression analysis. The results shows that 64% of the respondents had up to tertiary education, 53% have been in poultry business for 5 to 10 years, 60% perceived high risk associated with poultry business, 71% had experienced severe risk challenges in the past, 75% earned above N100, 000 (approx. \$ 625) monthly and 53% had access to credit facility. However, only 46% of the farmers were aware of the agricultural insurance policy and only 44% have adopted. Regression result showed that farmers' adoption of agricultural insurance will increase if there is increase in formal and extension education, higher level of awareness of insurance policy, more perception and concern for past experience with risk and less indifference resulting from too much confidence in their years of experience and alternative risk management strategies. It is recommended that government and other stakeholders' efforts should be directed towards policies and programmes that will further enhance those factors that increase farmers' adoption of agricultural insurance.

**Key words:** Risk • Agricultural Insurance • Adoption • Poultry • Abeokuta • Nigeria

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### **INTRODUCTION**

Risk has always been inherent to agriculture. Unlike the industrial sector, it is subject to the vagaries of weather natural catastrophe and disease outbreak [1, 2]. Farmers face a variety of market and production risks that makes their incomes unstable and unpredictable from year to year. This is particularly burdensome to small and medium-scale farmers in the developing countries [3]. According to Hazell [4], risk in agriculture, depending on degree, frequency and severity of attendant loss, may lead to long term poverty or even spill over into the rural non farm economy when people who earn incomes in the agricultural sector cannot afford to purchase other goods and services for their households.

Since the dangers of agricultural losses can be very devastating and crumbling, stakeholders have embarked on several structures and schemes, over the years, to prevent, manage or cope with this fearful phenomenon. In Nigerian poultry business, these risk management strategies include cooperatives participation, cutting back

household expenditure, diversification of enterprise, halting plans to expand business, borrowing and spending business reserves financial, formal and informal insurance among others [5- 7]. Despite this, grave production losses and market shocks still persist because of farmers' poor knowledge of appropriate coping strategy and attitude towards risks [8].

The co-variability of risks synonymous with agricultural enterprise reduces the efficacies of most of the risk management strategies, especially those that are traditional. The modern insurance sectors play a major role here and considerably strengthen the security of farmers [9, 10]. Even if risk preferences are fundamentally the same, those farmers who are able to insure their consumption against shocks take advantage of profitable, but risky, opportunities, while others may be limited to low-risk, low-return activities and lives of poverty [11- 14].

Agricultural insurance schemes are set up in Nigeria to help farmers in the cases of losses. The scheme was purposed to insure farmers against losses due to outbreak of pest, drought, or some natural catastrophe. Because of

the risk-prone nature of agricultural enterprises, the private sector have been largely reluctant to venture into agricultural insurance, the Nigerian Agricultural Insurance Corporation (NAIC) was set up by the government, as an insurance scheme effort, especially for the small scale farmers [6]. Unfortunately, the effort has not made much impact despite the fact that various governments introduced incentives to ensure that agricultural insurance is patronized and that it is sustainable and beneficial to the insurer, farmers and the public. A study, such as this, which assessed the factors influencing farmers' adoption of agricultural insurance scheme, has become very relevant for policy actions in Nigeria.

**The Nigeria Agricultural Insurance Scheme:** Generally, the insurance sector plays an important role in the development and sustenance of the economy [15]. The Federal Government of Nigeria introduced an agricultural insurance scheme in 1987. The broad aim of the scheme was to widen farmers' access to farm inputs, especially credit and to encourage farmers to adopt modern farming practices [16]. This aim was predicated on the belief that if the risks associated with the adoption of modern farming practices could be reduced, farmers could be encouraged to produce high value enterprises that had previously been abandoned and regarded as too risky to produce. The potential changes in farm practices would increase the quantity and quality of agricultural produce supplied to the market and subsequently improves the welfare of the people. The insurance scheme was operated as a commercial enterprise by The Nigerian Agricultural Insurance Company (NAIC) and offered a multi-peril insurance policy to cover agricultural enterprises. The scheme was designed to achieve the following objectives; to offer relief or compensation to farmers who suffer loss of crops or livestock resulting from the effect of natural hazards, to encourage financial institutions to become more liberal in providing credit to farmers, to enhance greater confidence in adopting new and improved farming practices and in making greater investment in agricultural industry and to prevent or at least reduce unemployment or underemployment among farmers [1, 16]. According to Oladele [16], agricultural insurance in Nigeria is designed basically to provide cover for financial loss incurred due to a reduction in expected outputs from agricultural products. The scheme was supposed to remain operative until the year 2000. Hence, in year 2001, a new policy document was launched. The new policy document bears most of the features of the old one, but with more focused direction

and better articulation. Among the features better highlighted include more emphasis on reduction of risks and uncertainties in agriculture, to be achieved through the introduction of a more comprehensive agricultural insurance scheme to reduce the natural hazard factor militating against agricultural production and security of investment; a nationwide, unified and all-inclusive extension delivery system under the Agricultural Development Programs (ADPs). Despite the improvements made, the challenge posed by incessant losses and market uncertainties in agriculture persists and most farmers still suffer insecurity.

**Research Methodology:** The research work was carried out in Abeokuta metropolis of Ogun State.

The state is located in the South Western part of Nigeria. Apart from being the largest town in Ogun state, poultry production is more established in Abeokuta than any other town in the state. The purposive sampling technique was used to select 80 poultry farmers. Primary data gathered covered socio-economic and institutional variables. Descriptive statistics and logit regression analysis were employed in analyzing the data collected.

**Model Specification:** The choice of the logit model is because the dependent variable is a dummy. Where the dependent variable is a dummy, the two models often used are the logit and probit regression models. But as Amemiya [17] has observed, the statistical similarity between logit and probit models makes the choice between them difficult. The logit model is however, computationally easier, thus, it was selected for this study. Following Gujarati [18], the model is specified as follows:

$$\ln(P_i/(1-P_i)) = \beta_0 + \beta_1 X_1 + \dots + \beta_{10} X_{10} + e_i$$

where:

$P_i$  = probability of farmer's adoption of agricultural insurance

$1-P_i$  = probability of not adopting agricultural insurance

$\beta_0$  = Intercept

$\beta_i (1,2,3,\dots,10)$  = Regression coefficients,

$X_i (1,2,3,\dots,10)$  = Independent variables and

$e_i$  = error term.

The independent variables specified as factors affecting the adoption of agricultural insurance and are defined below:

- $X_1$  = Educational status (years)  
 $X_2$  = Working experience (years)  
 $X_3$  = Household size  
 $X_4$  = Extension education (Yes= 1, No= 0)  
 $X_5$  = Awareness of agricultural insurance (Yes= 1, No= 0)  
 $X_6$  = Cooperative membership (Yes= 1, No=0)  
 $X_7$  = Perception of risk (High =1, Low = 0)  
 $X_8$  = Past experience with risk (severe = 1, mild = 0)  
 $X_9$  = Income level (N)  
 $X_{10}$  = Use of alternative risk mgt strategies (Yes = 1, No = 0)

## RESULTS AND DISCUSSION

**Results of Descriptive Statistics:** Results in Table 1 shows that the majority of the poultry farmers in the study area are above 40 years old (90%) and they are mostly male (93%). The predominance of male farmers is an indication that agribusiness is generally labour intensive and still a strenuous enterprise in Nigeria. Furthermore, the tedious and time-consuming nature of poultry business discourages most prospective female entrances into the business. The majority of the respondents (64%) had tertiary education which shows that there is high literacy level among the farmers in the study area. This is expected to positively influence their adoption of innovations and insurance policy [19, 20]. Most of the farmers had household size of more than 5 members. This is slightly above the national average of approximately 5 [21]. Household size is expected to vary directly with expenditure [22, 23].

With increasing household size, the more traditional option of cutting down on expenditure in managing risk becomes more and more difficult giving way to farmers' seeking alternative modern methods such as insurance cover.

In corroboration with good literacy level, farmers' experience in farming is expected to increase quality and quantity of output by reducing bird and egg losses and increase the use of technology. Usually, farmers' tend to have more positive outlook on risk since they are able to reduce business uncertainties. Their reluctance to continue spending money on insurance premium is likely to increase. They rather prefer less financially involving measures. The results further showed that approximately 53 percent of the farmers have been in business for between five and ten years which is relatively long enough for them to have gained mastery of the enterprise having passed through more than five production cycles.

Table 1: Distribution of farmers' characteristics

Characteristics	Frequency (n= 80)	Percentage (%)
<b>Gender</b>		
Male	74	92.5
Female	6	7.50
<b>Age</b>		
30-40	3	3.75
40-50	72	90.0
>50	5	6.25
<b>Educational level</b>		
Primary	3	3.75
Secondary	26	32.5
Tertiary	51	63.8
<b>Experience in poultry business (years)</b>		
<5	8	10.0
5-10	42	52.5
>10	30	37.5
<b>Participation in co-op</b>		
Access to credit	42	52.5
Access to Extension education	38	47.5
Awareness of agric insurance	37	46.3
<b>Experience with risk</b>		
Mild	23	28.7
Severe	57	71.3
<b>Perception of risk</b>		
Low	32	40.0
High	48	60.0
<b>Adoption of agric insurance</b>		
Household size	35	43.8
<b>Household size</b>		
≤ 5	33	41.3
> 5	47	58.8
<b>*Income per month</b>		
<50,000	8	10.0
50,000-100,000	12	15.0
>100,000	60	75.0

\*income in naira, N1~ \$ 0.00625

Source: Field survey (2013)

Some 60 percent of the farmers perceived that risks involved with poultry business are high and 71 percent of them have experienced severe risk challenges in the past. This might have influenced their adopting risk management measures. However, only 46 percent of the farmers were aware of the agricultural insurance policy and only 44 percent have adopted. Their poor access to extension services (48%) may be a contributing factor [24]. Although, 54 percent of the farmers participated and have benefited from cooperative membership, 46 percent still do not participate. The importance of cooperatives in credit access, education and risk aversion has been detailed by Nto *et al.* and Ayinde *et al.* [25, 6]. Most of the farmers (75%) earned above N100, 000 (approx. \$ 625) monthly and a good number of them (53%) have access to credit facility.

Table 2: Distribution of farmers' major alternative risk management strategies

Strategies	Frequency (%)
Increase staff working hours	77(96.3)
Cut back household spending/expenditure	75(93.8)
Diversification of farm enterprise	73(91.3)
Borrowing	71(88.7)
Off-farm investment	63(78.8)
Cooperative support	42(52.5)

\*multiple responses were recorded

Source: computed from field survey (2013)

Table 3: Logit regression for determinants of adoption of agricultural insurance

Variable	Beta coefficient	Standard error
Constant	0.867*	0.401
Formal education	0.784*	0.349
Experience	-0.278**	0.139
Household size	-0.600	0.425
Extension education	0.358*	0.720
Awareness of Insurance	1.890**	0.697
Cooperative membership	-0.722	1.011
Perception of risk	2.939**	1.069
Exp. with risk	1.977*	0.918
Income level	0.734	0.507
Use of alternative risk mgt strategies	-0.490*	0.226

-2 Log likelihood = -216.01\*\*\* chi-square = 98.307\*\*\*; Nagelkerke R<sup>2</sup> = 0.530

\*\*Significance at 1% \*Significance at 5%

Source: Field survey, 2012

### Farmers' Major Alternative Risk Management

**Strategies:** Aside the adoption of insurance policy, a number of alternative risk management strategies adopted by the sampled farmers have been summarized and presented in Table 2. Nearly all the respondents (96%) increase their staff working hours for the same wage as a measure for coping with business risk. This may likely increase staff turnover and even diminishing marginal productivity for labour.

Results also showed that significant proportion of the farmers cut back household spending/expenditure (94%), diversify farm enterprise (91%), result to borrow (89%), invest in off-farm business (79%) and seek cooperative support (53%) in order to cope with business risks. This result is consistent with the findings of Siyanbola and Ayinde *et al.* [26, 6]. Despite the fact that cooperative participation and use of insurance have been recommended as good strategies for reducing business risks [1, 7], apparently, they are not well used by a lot of the respondents.

### Factors Influencing Adoption of Agricultural Insurance:

The data on the determinants of the adoption of agricultural insurance were analyzed, using the logit regression model. A number of variables were

hypothesized to determine the farmers' decision to adopt of agricultural insurance in the study area such as socio-economic, institutional, awareness and risk perception variables. The result of the logit model analysis is presented in Table 3. The significance of the diagnostic statistics (chi-squared and log-likelihood value) shows a good fit for the model.

The results showed that the significant and positive determinants of adoption of agricultural insurance include formal education ( $p < 0.05$ ), extension education ( $p < 0.05$ ), awareness of insurance policy ( $p < 0.01$ ), perception of risk ( $p < 0.01$ ) and experience with risk ( $p < 0.05$ ).

This implies that the more educated the farmer was, either formal or through extension agents' effort, the more likely was the decision to use insurance as risk management measure. This is in line with *a priori* expectation and consistent with previous studies [20, 27]. The descriptive results however, showed that farmers have poor access to extension education (Table 1). As the level of awareness of the farmers about insurance increase, the probability of adoption also increases. Similarly, as the perception of the farmers about business risk grows stronger, they likely seek insurance cover. The nexus between awareness, perception and adoption has been detailed in literature [28, 22, 7]. The descriptive results showed that farmers' awareness of agricultural insurance and their perception about risks in poultry business is low. Furthermore, farmers who hitherto had an experience with risk, depending on the severity of the risk, will have higher reasons for seeking insurance cover. They become good source of awareness and agent of change for other farmers with little or no experience once they adopt.

Farmers' experience in poultry business and use of alternative risk management strategies negatively and significantly influenced adoption of agricultural insurance at 0.01 and 0.05 levels respectively. An increase in these factors reduces the probability of adopting agricultural insurance. Farmers in the study area had moderately high farming experience (Table 1) which might have contributed to their proficiency in utilizing technologies and alternative risk management approaches [29]. There are a number of alternative risk management strategies used by the farmers (Table 2), whether or not they are effective is another ball game.

### CONCLUSION AND RECOMMENDATIONS

Poultry farmers usually have to deal with severe risk at some points in the management of the enterprise.

The main objective of this study was to assess the factors influencing farmers' adoption of agricultural insurance in Abeokuta metropolis of Ogun State in South western Nigeria.

The study showed that, in coping with risk, aside seeking insurance cover, alternative risk management strategies adopted by sampled farmers included increasing their staff working hours for the same wage, cutting back on household expenditure, diversification of farm enterprise, borrowing, investing in off-farm business and seeking cooperative support. Farmers' adoption of agricultural insurance will increase if there is increase in formal and extension education, higher level of awareness of insurance policy, more perception and concern for past experience with risk and less indifference resulting from too much confidence in their years of experience and alternative risk management strategies.

Based on the research findings, it is recommended that government and other stakeholders' efforts should be directed towards policies and programmes that will further enhance those factors that increase farmers' adoption of agricultural insurance. The extension agency, community based organizations and research institutes are well appropriate organs for educating and disseminating agro-allied information. Thus, in collaboration with the insurance policy providers, awareness and education on insurance role in risk management should be incorporated in their package for outreach to poultry farmers especially.

#### REFERENCES

1. Nnadi, F.N., J. Chikaire, R. Echetama, P. Ihenacho, C. Umunnakwe and C. O. Utazi, 2013. Agricultural insurance: A strategic tool for climate change adaptation in the agricultural sector. *Net Journal of Agricultural Science*, 1(1): 1-9.
2. Edeh, H.O., E.C. Eboh and B.N. Mbam, 2011. Analysis of environmental risk factors affecting rice farming in Ebonyi State, Southeastern Nigeria. *World Journal of Agricultural Sciences* 7 (1): 100-103, IDOSI Publications, ISSN 1817-3047
3. Loghman, R., 2013. Factors affecting on demand for agricultural crop insurance in West Azarbijan Province. *American-Eurasian J. Agric. & Environ. Sci.*, 13(2): 244-249, IDOSI Publications ISSN 1818-6769
4. Hazell, P., 1992. The appropriate role of agricultural insurance in developing countries. *Journal of International Development*, 4(6): 567-581.
5. Mishra, A.K. and M. Morehart, 2001. Off-farm investment of farm households: A logit Analysis. *Agricultural Finance Review*, pp: 87-101.
6. Ayinde, O.E., O.A. Omotesho and M.O. Adewumi, 2008. Risk attitudes and management strategies of small –scale crop producer in Kwara State, Nigeria: A ranking approach. *African Journal of Business Management*, 2(12): 217-221.
7. Aina, O.S and B.T. Omonona, 2012. Nigerian Agricultural Insurance Scheme (NAIS): Prospect, achievement and problems. *Global Adv Res J Agric Sci*, 1(5): 97-103.
8. Pennings, J., O. Isengildina-Massa, S.H. Irwin, P. Garcia and D. Good, 2008. Producers' complex risk management choices. *Agribusiness*, 24(1): 31-54.
9. UNCTAD, 1994. *Agricultural Insurance in Developing Countries*. United Nations Conference report on Trade and Development (UNCTAD), New York.
10. Eswaran, M. and A. Kotwal, 1990. Implications of credit constraints for risk behavior in less developed economies. *Oxford Economic Papers*, 42(2): 473-82.
11. Rosenzweig, M. and H. Binswanger, 1993. Wealth, weather risk and the composition and profitability of agricultural investments, *Economic Journal*, 103(416): 56-78.
12. Mosley, P. and A. Verschoor, 2005. Risk attitudes and vicious circle of poverty, *European Journal of Development Research*, 17(1): 55-88.
13. Dercon, S. and L. Christiaensen, 2007. Consumption risk, technology adoption and poverty traps: Evidence from Ethiopia. *World Bank Policy Research Working Paper 4257*. Washington, DC
14. Yesuf, M., M. Kassie and G. Köhlin, 2009. Risk implications of farm technology adoption in the Ethiopian Highlands. *Environment for Development Discussion Paper Series*. Efd-DP 09-13.
15. Wasim-ul-Rehman, Nabila Asghar and Hafeez ur Rehman, 2013. Intellectual capital efficiency and financial performance of insurance sector in Pakistan: a Panel Data Analysis. *Middle-East Journal of Scientific Research*, 17 (9): 1251-1259, IDOSI Publications ISSN 1990-9233.
16. Oladele, O.O., 1995. *Agricultural insurance as management option for risks and uncertainties in agricultural production: A case study of crop producers in Oyo State*, PhD thesis, Univ. of Ibadan, Nigeria.
17. Amemiya, A., 1981. Qualitative response models: A survey. *Journal of Economic Literature*, 19: 1483-1533.

18. Gujurati, D.N., 1998. Basic econometrics. McGraw hill, New York, pp: 98-102.
19. Fawole, O.P. and O. Fasina, 2005. Factors predisposing farmers to organic fertilizer Use in Oyo State, Nigeria. *Journal of rural economics and development*, 14(2): 81-91.
20. Mohammed, M.A. and G. Ortmann, 2005. Factors influencing adoption of livestock insurance by commercial dairy farmers in three Zobatat of Eritrea. *Agrekon*, 44(2): 83-92.
21. NBS. 2006. Nigeria Bureau of Statistics Annual Abstract of Statistics report, pp: 30-34.
22. Babalola, D.A. and Y. Babalola, 2013. Economic effects of media campaign against pandemic diseases: The Case of Bird Flu (H5N1) on poultry business in Ogun state, Nigeria. *Arabian Journal of Business and Management Review*, 2(12): 80-88.
23. Gebremedehin, B and M.S. Scott, 2003. Investment in soil conservation in Northern Ethiopia: The role of land tenure security and public programs. *Agricultural Economics*, 29: 69-84.
24. Muhammad, A., L. Cui, Xia, Jia Li, S. Ghazanfar, Y. Mehmood, M. Nadeem Ishaq and Shah Saud, 2014. Effectiveness comparison between the Farmers Field School and the Training & Visit Approaches of agricultural extension in two districts of Pakistan. *American-Eurasian J. Agric. & Environ. Sci.*, 14(1): 33-39, IDOSI Publications ISSN 1818-6769.
25. Nto P.O., J.A. Mbanasor and J.C. Nwaru, 2011. Analysis of risk among agribusiness enterprises investment in Abia state, Nigeria. *Journal of Economics and International Finance*, 3(3): 187-194.
26. Siyanbola, A.A., 2012. Investigating the determinants of appropriate use of microcredit by poultry farmers in Western Nigeria. *British Journal of Poultry Sciences* 1(1): 01-04, IDOSI Publications, ISSN 1995-901X
27. Feder, G., R. Just and D. Zilberman, 1985. Adoption of agricultural innovation in developing countries: A survey. *Economic Development and Cultural Change*, 33(2): 255-298.
28. Augustine, C., A. Midau and M.R. Ja'afar-Furo, 2010. Effects of level of awareness of Pig rearers about Swine Flu on markets prices of Pigs in Mubi Zone, Nigeria. *American-Eurasian J. Agric. & Environ. Sci.*, 7 (5): 607-610, IDOSI Publications, ISSN 1818-676
29. Ugwumba, C.O., R.N. Okoh, P.C. Ike, E.L.C. Nnabuike and E.C. Orji, 2010. Integrated Farming System and its effect on farm cash income in Awka South agricultural zone of Anambra State, Nigeria. *American-Eurasian J. Agric. & Environ. Sci.*, 8(1): 01-06, IDOSI Publications, ISSN 1818-6769.