

The Role of Extension Service in Risk Management in Poultry Production in Katsina Metropolis, Katsina State

Nabinta. R. T.¹, Tijjani, A. R.², Muntaka. M.³

¹⁻³Department of Agricultural Economics and Extension, Federal University Dutsinma, P.M.B. 5001, Dutsinma, Katsina State, Nigeria.

Abstract: The study analyzed the role of extension in risk management among poultry farmers in Katsina metropolis. Multi stage sampling technique was used to select 100 poultry farmers for the study. The analytical techniques used included descriptive statistics and ordinary least square regression model. Result revealed that 64% were male and the youthful ages (20-49) constitute 61%. Also, 52% of the farmers had tertiary education, 16% and 53% had access to credit and social participation respectively. More so, 57% had extension contact, 76% had experience in poultry production and 79% earned #100, 000: 00 yearly. The major hazards faced by farmers were heat stress, disease outbreak, ill health, and drought and market glut. Factors which positively and significantly ($p < 0.05, 0.01$) determine risk management included age, educational level, income, experience in poultry production, social participation and training. On the other hand, the extension contact is not significant (0.368). Therefore, extension services need to be intensified and risk behavior of farmers, factors influencing such should be considered in planning, design and development of future interventions.

Keywords: Role of extension, risk management, poultry production.

I. Introduction

The challenges of food insecurity and hunger worldwide particularly in developing countries like Nigeria have continued to receive attention from experts and Governments (Emaikwu et al., 2011). Consequently several conferences and World Food Summits on human nutrition have brought to fore for debate the issue of eradicating extreme poverty and hunger. FAO (1995) asserted that the most critical in the global food basket crises is animal protein. Studies by Okayeto (1992); CBN (1993); Egbunike (1997); and Ojo (2003) cited in Emaikwu et al. (2011) revealed that in spite of the numerous human and natural resources of Nigeria, it still remains among the least consumers of animal protein in Africa. For example, the protein intake of an average Nigerian is about 53.8% with only 6.0 to 8.4 g/head/day of animal origin compared to North America, Western and Eastern countries consume 66, 39 and 33 of animal protein g/head/day, while an average Nigerian consumes 7.5 g which is below the recommended level of 27 g/head/day. This therefore calls for urgent need to increase poultry production at both household and commercial holdings. A report by Okonkwo and Akubo (2001) quoted in Ohajianya *et al.* (2013) shows that about ten (10) percent of Nigerian population are engaged in poultry production, mostly on subsistence and small or medium – sized farms. Poultry production contributes to the nation's gross domestic product (GDP). Study conducted by Akpi and Akinwunmi (1979 in) Damisa and Hassan (2009) described the development of the poultry industry as the fastest means of bridging animal protein deficiency gap prevailing in Nigeria.

In Nigeria, production activities of poultry farmers are characterized by high level of risks. These include high costs of inputs and veterinary services which reduces productivity and net returns from the investment. In some cases, outbreak of diseases could wipe out the entire population of birds in a poultry leading to the collapse of the business enterprise itself, because they practice small scale farming with little opportunity for diversification and insurance Oparinde (2008) cited in Abinbola et al. (2013). As pointed by Babalola and Babalola (2013) cited in Babalola (2014), their attitude to risk often influence their adoption of new technologies and to a large extent determine the success of many rural development programs. Most agricultural entrepreneurs, in the process of taking business decision, adopt the 'safety-first' rule before taking any risk. Based on the rule, the security of generating returns large enough to cover subsistence needs influence the decision maker's productive resource-use efficiency. Miers (2008a) cited in Vu Thi Thu (2010) showed that after the avian influenza outbreak, in Indonesia, 59% of layer farmers and 91% of broiler farmers drew on their savings and some went into trade. In Lao PDR, the surveyed farms predominantly entered into fish farming, followed by cattle and pig production. Similarly, Dolberg (2005) asserted in Vu Thi Thu, (2010) shows that in Egypt, the female producers claimed that they had to remove their children from school to enhance poultry production. Meanwhile, other women accepted a low-income level and relied on husband's salaries or transfers. In Nigeria, the poultry farmers were forced to take loans to cover household expenditure after high pathogenic avian influenza (HPAI) outbreak. Ethiopian producers would cope with an HPAI outbreak by reducing non-

essential expenditure whilst not foregoing staple food purchase. In Vietnam, to cope with the loss by avian influenza, many households have reduced the expenditure on their children's education

Farmers' attitude towards risk and decision making can be divided into three general types:

- a. Risk averse
- b. Risk preferring
- c. Risk neutral.

A farmer can be in one of these types during a decision making process although he may not be in the same category for all decisions.

Risk averters are cautious individuals who prefer less risky sources of income or investments. They will sacrifice some amount of income to reduce the probability of low income or losses; this implies that they will forego some possible gains to reduce the probability of losses. This is referred to as his "risk premium" and it increases with the degree of risk aversion. Averting risk does not mean that the individual will bear no risk at all; instead he must be compensated for taking risks by receiving a return that is greater than what would be received if the outcome of an action choosing were certain. Risk preferring individuals however, would not be willing to give up the possibility of gains in order to reduce the probability of losses; he prefers more risky business alternatives. But a preference for risk does not mean that the individual will accept any risk regardless of the return; instead, it means that an individual will pay a premium or accept a return that is lower than would be expected if the outcome of a choice of action were certain in exchange for the opportunity to take a chance. Risk neutral individuals on the other hand make decisions based on the expected values of distributions of consequence. He selects the action with the highest expected value irrespective of the associated distribution of outcomes.

The extension service is seen as consisting of all the different activities that provide the information and services needed and demanded by farmers and other actors to assist them in developing their own technical, organizational, management skills and practices so as to improve their livelihoods and well-being. It envisions much broadened support to rural communities (beyond technology and information sharing). Inclusive is advice related to farm, organizational and business risk management; facilitation and brokerage in rural development Chikaire et al. (2014). This confirms Lawal et al. (2009) study that revealed that agricultural extension service has played a significant role in improving poultry production in Nigeria. The sector plays a pivotal role in ensuring the awareness and subsequent adoption of the contemporary methods of poultry production. Studies conducted on risk management in poultry production in Nigeria include; Ajetomobi and Binuomote (2006) in Ogbomosho Oyo State; Abimbola et al. (2013) in Oyo State and Babalola (2014) in Abeokuta Ogun State. However, no study has been conducted on the role of extension in risk management in poultry production in Katsina State, North-western Nigeria. The paucity of empirical evidence on the concept justifies further investigation.

The specific objectives are to:

1. Identify the socio-economic characteristics of poultry farmers.
2. Characterize the incidence of bird flu in the study area based on the causes, stage and type of birds affected
3. Determine the hazards confronted in poultry production
4. Ascertain the risk management behavior of poultry farmers.

II. Research Methodology

The research work was carried out in Katsina metropolis of Katsina State. Poultry production is more pronounce in Katsina metropolis compared to other town in the State. Purposive and random sampling techniques were used to select 100 poultry farmers keeping layers and broilers respectively. Data collected covered the following variables; socio-economic characteristics, incidences of bird flu based on the causes, stages and types of birds affected, sources of hazard in poultry production and risk management behavior. Ordinary least square regression model was used to analyze the data and determine the role of extension on farmers' attitudes towards risk management.

The model can be explicitly stated as:

$$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, e)$$

Where;

Y = Risk management

X1 = age of respondents in years

X2 = gender (male = 1; female = 0)

X3 = level of education in years

X4 = income per annum

X5 = social participation (yes=1, no=0)

X6 = access to credit (yes=1, no=0)

X7 = Extension Contact (yes=1, no=0)

X8=Training
 X9=experience in poultry production in yrs
 e = error term

III. Results And Discussion

Table 1 shows that majority of poultry farmers in the study area are males (64%). The age range of the respondents shows that majority (61.0%) are within the productive age (20- 49) years; the age cohort that is considered to be agile, keen and more receptive to innovative ideas. Again, (52.0%) had tertiary education which indicates that they have the capacity to make changes fast with regard to education. There is a general consensus that educational attainment is directly and positively related with acceptance and utilization of agricultural information. Farmers' ability to read and analyze agricultural information is enhanced through education Tadesse (2008) in Tijjani et al. (2015). Others are 37.0% secondary education, 9.0% primary education. The greater majority have disadvantage in terms of access to credit (84.0%) which reveals that they source their capital from informal sources. This could be due to the ease of obtaining loans, low interest rates and other benefits from such Informal Institutions or due to rigor procedures of obtaining loan from the Financial Institutions. On the other hand, the majority (53.0%) participates in cooperatives; the benefits derived include; credit facilities, loans, source of information. This corroborate with the findings of Nto et al. (2011) in Babalola (2014). Majority (57.0%) had extension contact, these results agree with Polson and Spencer (1991) that such contacts plays important roles on diffusion of innovations. Also, (76.0%) have experience in poultry production. This signifies that farmers are knowledgeable in poultry production, including hazards and risk management aspects which necessitate them to seek alternatives. The income of farmers revealed that (79.0%) earned #100,000 yearly.

Table 1 : Distribution of farmers characteristics

Characteristics	Frequency	(%)
Gender		
Male	64	64%
Female	36	36%
Age		
20-29	1	1%
30-39	14	14%
40-49	45	45%
50-59	33	33%
< 60	7	7%
Educational level		
Non a literate	2	2%
Elementary	9	9%
Secondary	37	37%
Tertiary Institutions	52	52%
Experience years		
5 years	80	80%
Participation cooperative	53	53%
Access to credit	16	16%
Extension contact	57	57%
Income (#100, 000) yearly	79	79%

Source: Field survey (2015)

Tale 2 indicates that majority (80.0%) of the respondents are aware of the causes of bird flu. (71.0%) and (83.0%) poultry farmers noticed the disease emerge at all stages of development and mostly attack chickens respectively. Their literacy level and experience helps them in seeking/ taking precautionary and preventive measures.

Table 2 : Causes, stages and type of birds affected by bird flu

Variable	Frequency	(%)
Causes		
Virus	80	80%
Stages of attack		
All stages	71	71%
Birds affected		
Chickens	83	83%

Source: field survey (2015)

Farmers face myriads of hazards and uncertainty in their farming business, Table 3 shows the hazards farmers' face in the study area. The major hazards faced by the respondents are that of heat stress (96.0%) which affects both the production and productivity of the enterprise. Another risk is the outbreak of disease (92.0%).

Disease outbreaks hinder the entire poultry enterprise and at times lead to total losses of the whole business. Also, ill-health (89.0%) is another tremendous impediment. A healthy farmer is a wealthy farmer. When a farmer is sound, it increases his output. A sick farmer does less. Other hazards in poultry farming business include drought (82.0%), market glut (81.0%), unpredictable exchange rate (78.0%), fire outbreak (75.0%), low capital (70.0%), high cost of input (69.0%), rain storm (68.0%), unstable institutional policy (59.0%), predators (50.0%) and theft (40.0%). Supporting the findings, Chistoplos (2010) asserted in Chikaire et al. (2014) posited that agricultural risk is associated with negative outcomes that stem from unpredictable biological, climatic and price variables. Natural hazards for example, pests/diseases, drought and floods are not within the control of farmers.

Table 3 : Sources of hazard in poultry production

<u>Risk sources</u>	<u>Freq(%)</u>
Heat stress	96 (90.0%)
Disease outbreak	92 (92.0%)
Ill-health	89 (89.0%)
Drought	82 (82.0%)
Market glut	81 (81.0%)
Unpredictable exchange rate	78 (78.0%)
Fire outbreak	75 (75.0%)
Low capital	70 (70.0%)
High cost of input	69 (69.0%)
Rain storm	68 (68.0%)
Unstable institutional policy	59 (59.0%)
Predators	50 (50.0%)
Theft	40 (40.0%)

Multiple response: Source: field survey (2015)

Table 4 shows that majority (64.0%) of the farmers have positive risk coefficients and were therefore categorized as risk averse. Farmers' attitude towards risk explains many observed economic decisions. Therefore, knowledge of farmers' attitude towards risk has important implications for the adoption of new farm technologies and the success of rural development programs Wik et al, (2004) quoted in Babalola (2014). The finding contradicts Ayinde et al, (2008) that stated that many farmers are not risk averse.

Table 4: Distribution of farmers attitude toward risk management

<u>Category</u>	<u>Freq.</u>	<u>Percentage</u>
Risk aversion	64	64%
Risk preferring	19	19%
Risk neutral	17	17%

Multiple response: Source: computed from field survey (2015)

Regression analysis was conducted on the variables to determine the contributions of each of independent variables to the risk management employed by poultry farmers. The result is presented in (Table 5). The adjusted coefficient of determination (R^2) value is 0.298 revealing that the variables in the regression model put together explained about 30% of the variation in the specified dependent variable. The value of the F-statistics was found to be significant at 1%. This result shows that all the independent variables had a joint impact on the dependent variable. The variables that were significant at 0.05% are age, education, income, social participation and training. All except training and gender have a positive coefficient. This implies that, risk management techniques of the poultry farmers moves positively with their age, educational level, income and social participation. It further means the higher the age and educational level the better the risk management techniques. Likewise, the active the Farmers participate in cooperative activities the better also the risk management techniques. Also, the higher the income the more risk management innovations purchased. However, the coefficient of training is negative which implies that an increase in farmers' training will bring about a decrease in farmers' risk management capability in poultry production. This is not in line with the expected. This might be due to the inefficiencies of the training in creating a meaningful impact on the poultry farmers in the area. Experience in poultry production was statistically significant at 0.01% indicating that the higher the years of experience in poultry production, the higher the risk management strategies adopted.

Table 5: Regression for socioeconomic determinants of farmers' on risk management

Variable	Coefficient	P-value
Gender	-0.173	0.318
Age	0.016	0.071*
Education level	0.020	0.064*
Credit access	0.193	0.186
Income	0.113	0.051*
Social Participation	0.344	0.045*
Extension contact	0.199	0.368
Training	-0.720	0.029*
Experience in Poultry production	0.059	0.005**

*significant at 5%, **significant at 1%, $R^2 = 0.293$

Sources computed from field survey (2015)

The regression result on Table 5 further reveals that the extension contact is not significant despite the fact that descriptive results showed the majority (57.0%) had extension contact. This may be possible that contacts and trainings may not specifically focus on risk management in poultry production. More so, considering the current status of extension agent/farmer ratio of 1:2000 in the study area this is far above the World Bank recommendation of extension agent/farmer ratio of 1:1000 (Restoration Project, 2015). This creates inaccessibility and information gap between extension agents and farmers on diffusion and adoption of innovations.

IV. Conclusion And Recommendations

The study focused on the role of extension in risk management in poultry production in Katsina metropolis of Katsina State in North western Nigeria. The study revealed that most of the farmers were at the productive age, majority had tertiary education, extension contact and social participation, while majority earned #100,000 yearly. On the other hand, greater majority had no access to credit and farmers' were confronted with several hazards such as; heat stress, disease and ill-health, drought and market glut. The greater percentages are aware of the parasitic virus causing avian influenza and it affects all birds' at all developmental stages. Most of the farmers are risk averse and the factors which determined the risk averse include their age, level of education, income, social participation, experience in poultry production and training. All these factors have been found to positively and negatively influence farmers' aversion for risk.

Based on the research findings, it is recommended that extension advisory services need to be invigorated in order to support farmers risk management initiatives through facilitation, networking and brokering for risk management. Efforts should be directed towards policies and interventions that will further enhance farmers' participation and utilization of cooperatives in ameliorating production and marketing risks. Financial Institutions, either Government or Private, are encouraged to collaborate with insurance companies in ensuring agricultural credit facilities to indirectly insure farms against risks. Efforts should be geared towards the development of programs and institutions that would reduce all forms of risk resulting to losses emanating from poultry production. Furthermore, Government intervention policies targeting poultry production should put into consideration the major sources of hazards as identified in this study in order to provide a workable solution.

References

- [1]. Abimbola, L. O., Adepoju, O. A. T., and Abayomi, S. O. (2013). Risk coping behavior of small scale poultry farmers in Ogun State, Nigeria. *Asian Jour. of Ani and Vet. Advances*, (8): 786-795.
- [2]. Ajetomobi, J.O. and Binuomote, S.O. (2006). Risk aversion among poultry egg producers in Southwestern Nigeria. *International Journal of Poultry Science* 5 (6): 562-565
- [3]. Ayinde. O. E., Omotosho. O. A. and Adewumi. M. O. (2008). Risk attitude and management strategies of small-scale crop producers in Kwara State, Nigeria: A ranking approach. *African Journal of Business Management* 2(12): 217-221
- [4]. Babalola D. A. (2014). Risk preferences and coping strategies among poultry farmers in Abeokuta Metropolis, Nigeria. *Global Journal of Science Frontier Research: D Agriculture and Veterinary* Volume 14(5).
- [5]. Chikaire, J. U., Ani, A. O., Atoma, C. N., and Tijjani. A. R. (2014). Extension services for effective agricultural risk management in Orlu Agricultural Zone of Imo State, Nigeria. *Sch. J. Agric. Vet. Sci.* 2(1A): 310-317.
- [6]. Damisa, M. A. and Hassan, M. B. (2009). Analysis of factors influencing the consumption of poultry meat in the Zaria Emirate of Kaduna State, Nigeria. *European Journal of Educational Studies* 1(1)
- [7]. Emaikwu, K. K., Chikwendu D. O. and Sani A. S. (2011). Determinants of flock size in broiler production in Kaduna State of Nigeria. *Journal of Agricultural Extension and Rural Development* Vol. 3(11): 202-211
- [8]. Food and Agricultural Organization (1995). *A Hand book on development in Nigeria from 1996 – 2003*, Rome, 210 p.
- [9]. Katsina State Agriculture Restoration Project (2015). *A report submitted to Katsina State Government on Restoration of Agriculture*. Pp. 1-150.
- [10]. Lawal, B. D., Torimoro, D. O. and Makunjuola, B. A. (2009). Impact of agricultural extension practices on the Nigerian poultry farmers' standard of living: A perceptual analysis. *Tropical and Subtropical Agro-ecosystem* (10): 465-473.

- [11]. Ohajianya, D. O., Mgbada, J. U. Onu, P. N. and Enyia, C. O. (2013). Technical and Economic Efficiencies in Poultry Production in Imo State, Nigeria. *American Journal of Experimental Agriculture* 3(4): 927-938
- [12]. Polson, R. A. and Spencer, D.S.C. (1991). The technology adoption process in subsistence agriculture: The case of cassava in Southwestern Nigeria. *Agricultural Systems* (36): 65-77.
- [13]. Tijjani, A. R., Akpoko, J. G., and Abdullahi, K. A. (2015). Sources of agricultural information used by cowpea farmers in Rimi Local Government Area of Katsina State. *Journal of Agriculture and Crop Research* 3(2): 21-26.
- [14]. Vu Thi Thu. H. (2010). The effects of avian influenza on rural poultry farmers' livelihood: A case study of Yen Son and Tam Binh communes – Tan Diep town – Ninh Binh province, Vietnam. Unpublished M.Sc. Thesis, Department of Urban and Rural Development. Faculty of Natural Resources and Agricultural Sciences. Swedish University of Agricultural Sciences.