

## Assessment of Risks and Uncertainties in Poultry Farming in Kwara State, Nigeria

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Abstract	Article Information
<p>This study was designed to assess the risks and uncertainties encountered by poultry farmers in Kwara State, Nigeria. Specifically, the study describes the socio-economic characteristics of the farmers, identify the risks and uncertainties encountered by the farmers, determines the level of severity of the risks and uncertainties, and identifies the coping strategies employed by the farmers. Primary data obtained from 99 registered poultry farmers selected through multistage sampling technique were used for the study. These were complemented with data from published and grey literature. Descriptive statistics and 3-point Likert scale were used to analyze the data. The study shows that poultry farming in the study area is practiced mainly by young, small-scale farmers, who are married, with high level of formal education but had little access to extension services. The major sources of risks encountered by the farmers were severe weather fluctuation, lack of veterinary services, disease outbreak, transportation problems, parasites and severe price fluctuation of birds. The study further revealed that the severe risks encountered by the farmers were disease outbreak, poor parent stock, accumulation of dung, severe weather fluctuation, lack of veterinary services and transportation problems. The study therefore calls for improved extension services, good transportation facilities, adequate veterinary services, market information by government and relevant stakeholders as well as formation of cooperative societies by the farmers.</p>	<p><b>Article History:</b>  <b>Received</b> : 15-09-2014  <b>Revised</b> : 25-11-2014  <b>Accepted</b> : 18-12-2014</p> <hr/> <p><b>Keywords:</b>  Poultry  Risks  Farmers  Severity  Coping strategies</p> <hr/> <p><b>*Corresponding Author:</b>  <b>Ibrahim Kayode B</b>  <b>E-mail:</b>  frome2ukay@yahoo.com</p>
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### INTRODUCTION

The place of poultry in the livestock sector of any nation cannot be under rated. This is important not only in term of economic activities but also in the quest for attaining food security in term of protein consumption. Ojo (2003) noted that poultry birds are good converters of feed into useable protein in meat and eggs, and have low production cost per unit relative to other types of livestock. Also, the return to investment is high, thus farmers need just a small amount of capital to start a poultry farm especially the deep litter system of production. Egg, which is one of the major products of poultry production, is one of the most nutritious and complete foods known to man. Hence the poultry sector could be a panacea to protein deficiency which is a major challenge to food security and is particularly critical in Africa (NDHS, 2008). This is more so important in Nigeria where the current per capita consumption of animal protein is 10g/day as against the 34 g/day recommended by the FAO as the minimum for healthy living (FAO, 2014, Owen and Dike, 2013). The nutritional status of its populace could also be boosted by such product.

One of the problems confronting operation and progress in the agricultural sector today is risk and uncertainties. Risk is the probability of harmful consequences or expected losses resulting from interactions between natural or human-induced hazards and vulnerable conditions, whose probability and outcome can be predicted and measured in quantitative terms, hence it can be insured. While uncertainty is where there are more than one possible outcome to a course of action and the form of each possible outcome is not known (Dwivedi, 2003). In practice, both concepts are very much related and are used interchangeably, as there is no risk without some level of uncertainty and most uncertainties typically implies some level of risk (OECD, 2009). The menace of risk and uncertainties is enormous; it brings about colossal loss in monetary value, psychological displacement and even total failure in business (Hamid and Chiman, 2010), hence risk management becomes imperative.

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 (Claire, 2010). Since risk and uncertainties influence investment decisions, it is important to assess the risks and uncertainty situations surrounding one of the important livestock sectors (the poultry sector) with the aim of understanding and finding better ways of improving the enterprise. This paper therefore provides answers to the following questions:

- i. What are the socio-economic characteristics of the poultry farmers in the study area?
- ii. What are the risks and uncertainties situations facing the poultry farmers in the study area?
- iii. How severe are the risks and uncertainties encountered by the farmers?
- iv. What are the common risk management practices adopted by the farmers?

The main objective of this study is to assess the risks and uncertainties associated with poultry farming in Kwara State, Nigeria. The specific objectives are to

- i. describe the socio-economic characteristics of the poultry farmers in the study area;
- ii. identify the risks and uncertainties encountered by the poultry farmers;
- iii. determine the level of severity of the risks encountered by the farmers; and
- iv. identify risks and uncertainty practices by the poultry farmers.

## MATERIALS AND METHODS

This study was conducted in Kwara State, Nigeria. The state is located in the North-Central zone of Nigeria with a population of about 2.37 million (National Population Commission, 2006). The state lies between latitude 7°15'N and longitude 6°18'E and covers a land area of about 32,500 km<sup>2</sup> (Kwara State Ministry of Information, 2002). The state has two main climate seasons: the dry and wet season. The natural vegetation comprises wooded and rainforest savanna, with annual rainfall ranging between 1000 to 1500 mm. The annual rainfall pattern across the state extends between the months of April and October with minimum temperature ranging from 21.1°C to 25°C while maximum average temperature ranges from 30°C to 35°C. The state is made of sixteen (16) Local Government Areas (LGAs) which are grouped into four (4) agricultural zones – A, B, C and D - by the state's Agricultural Development Project (ADP) based on agronomic and cultural characteristics. Agriculture is the mainstay of the economy of the state.

A multi-stage sampling technique was adopted for the study. The first stage involved purposive selection of Zone C out of the four agricultural zones in the state. Selection of the zone was premised on the aprior information obtained from the state's ADP that poultry farmers were more concentrated in the zone than any part of the state. The zone is made of five LGAs namely, Ilorin South, Ilorin West, Ilorin East, Asa and Moro. Second, twenty (20) poultry farm households were selected in each LGA based on the list of the registered poultry farmers obtained from the ADP. Thus, a sum of one hundred (100) respondents were selected and interviewed.

The research instrument used was structured questionnaire augmented with interview schedule. Information was gathered on the socio-economic

background of the respondents, sources and perceived level of risks encountered, and the coping strategies employed. The study was also complemented with data from published and grey literature.



Figure 1: Map of Nigeria indicating kwara state

Data obtained were analyzed with descriptive statistics and 3-point Likert Scale. The descriptive tools such as frequency count, percentage, mean and standard deviation was used to summarize the demographic profile of the respondents, sources of risks encountered and the coping strategies employed by them. Level of interference with risks was determined by making a list of possible risks and requesting the respondents to rate the degree of importance of the risks along a 3-point Likert type scale of least severe = 1, severe = 2, and very severe = 3. The mean of the response values which is 2.0 was taken as the cut-off point such that risks with mean score of 2.0 and above were regarded as severe, while those with mean score of below 2.0 were regarded as less severe risks.

## RESULTS AND DISCUSSIONS

### Socio-economic Characteristics of the Respondents

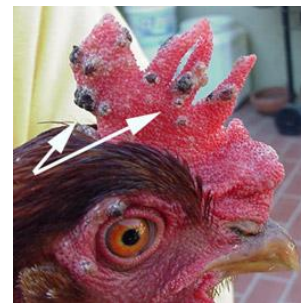
Table 1 shows the the socio-economic profile of the respondents. Majority (64.6%) of the respondents were male while 35.4% were female. The age of the respondents ranged from 21 to 67 years. The modal group of the respondents was 31 – 40 years. Analysis of the age of the respondents revealed that the mean age of the households was 43years. Most (87.9%) of the farmers were married while just 12.1% of them were single. The household size of the respondents ranged from 2 to 18 with most (67.7%) of them having a household size of two to five persons. About 98% of the respondents had formal education while just 2% had no formal education. The result of the educational status of the respondents further shows that majority (73.7%) of the farm households had tertiary education. The analysis further revealed that the educational status of the respondents tends towards higher education. The modal farming experience of the respondents ranged from 1 – 5years while the average was 5years. Most of the farmers engage in poultry farming on part-time basis and 81.8% of the respondents had a farm size of 1 - 1000 birds, with an average farm size of 343birds. The monthly household income of the respondents ranged from N10,000 to N72,000 with an average monthly household income of N26,623 (1 USD = N158). Investigations during survey revealed that 65.2% of the respondents earned at least N18,000 (USD 113.9), which is the current minimum wage in Nigeria. Just 32.3% of the respondents were members of cooperatives and majority (76.8%) of the respondents did not have access to agricultural extension services.

**Table 1:** Socio-economic characteristics of respondents (n = 99)

Characteristics	Category	Frequency	Percentage	Mean
Sex	Male	64	64.6	
	Female	35	35.4	
Age of household head	21 – 30	19	19.2	43 years
	31 – 40	32	32.3	
	41 – 50	30	30.3	
	51 – 60	12	12.1	
	>60	6	6.1	
Marital Status	Married	87	87.9	
	Single	12	12.1	
Household size	≤ 5	67	67.7	5
	6 – 10	27	27.3	
	11 – 15	3	3.0	
	16 – 20	2	2.0	
Educational Status of household head	No formal education	2	2.0	
	Primary education	2	2.0	
	Secondary education	22	22.2	
	Tertiary education	73	73.7	
Farming experience (years)	1 – 5	67	67.7	5 years
	6 – 10	27	27.3	
	11 – 15	3	3.0	
	16 – 20	2	2.0	
Nature of farming	Full-time	22	22.2	
	Part-time	77	77.8	
Stock size	1 – 1,000	81	81.8	343 birds
	1,001 – 2,000	12	12.1	
	2,001 - 3,000	4	4.0	
	>3000	2	2.0	
Household monthly income (N)	10,000 – 20,000	45	45.5	N26,623
	20,001 – 30,000	20	20.2	
	30,001 – 40,000	13	13.1	
	40,001 – 50,000	9	9.1	
Membership of cooperatives	Yes	32	32.3	
	No	67	67.7	
Access to extension services	Yes	23	23.2	
	No	76	76.8	

### Sources of Risks and Uncertainties Encountered by the Respondents

Table 2 presents the sources of risks and uncertainties faced by the respondents. About 90% of the respondents faced the risk of severe weather fluctuation, 81.8% encountered lack of veterinary services, 79.8% of them experienced disease outbreak, 76.8% faced transportation problems and 71.7% faced menace from parasitic attack on their birds. Severe fluctuation in prices of birds was encountered by 70.7% of the respondents while 66.7% of the them complained of severe fluctuations in prices of poultry products.

**Figure 2:** Fowl pox, a form of disease outbreak**Table 2:** Sources of risks encountered by the respondents (N = 99)

Variable	Frequency	Percentage	Ranking
Accumulation of dungs	58	58.6	8th
Severe weather fluctuation	89	89.9	1st
Shortage of water	48	48.5	10th
Shortage of feed	25	25.3	14th
Disease outbreak	79	79.8	3rd
Parasites	71	71.7	5th
Accident	28	28.3	12th
Lack of veterinary services	81	81.8	2nd
Failed vaccine	22	22.2	15th
Severe price fluctuation of birds	70	70.7	6th
Severe price fluctuation of products	66	66.7	7th
Poor parent stock	50	50.5	9th
Theft	16	16.2	16th
Rotting of eggs at storage	27	27.3	13th
Transportation problems	76	76.8	4th
Death of birds	37	37.4	11th

Accumulation of poultry dungs constituted a risk to 58.6% of the respondents, poor parent stock (50.5%), shortage of water (48.5%), death of birds (37.4%), accident (28.3%) and rotting of egg at storage (27.3%). Other risks and uncertainties experienced by the respondents were shortage of feed, failed vaccines and theft, and encountered by 25.3, 22.2 and 16.2 % of the respondents respectively.

#### Level of Interference with Risks and Uncertainties by the Respondents

The results of the 3-point likert scale used to assess the level of severity of the risks and uncertainties encountered by the respondents are shown in Table 3.

Disease outbreak had a mean score (M) of 2.51, poor parent stock had a mean score of 2.42 while accumulation of dungs had mean score of 2.41. The mean scores of severe weather fluctuation, lack of veterinary services, transportation problems and failed vaccine had a mean score of 2.21, 2.20, 2.01 and 1.72 respectively. A mean score of 1.70 was obtained for rotting of eggs at storage, a score of 1.55 was obtained for parasites, 1.54 for death of birds and a mean score of 1.36 for accident. Shortage of water, fluctuation in prices of birds and products all had a mean score of 1.29 each while shortage of feed, theft and cannibalism had a mean score of 1.28, 1.25 and 1.21 respectively.

**Table 3:** Level of interference with risks and uncertainties by the respondents (n = 99)

Risk	Very severe		Severe		Less severe		Men	SD	Remark	Ranking
	Freq	%	Freq	%	Freq	%				
<b>Environmental risks</b>										
Shortage of feed	1	1.0	5	5.1	19	19.2	1.28	0.73	LS	15
Shortage of water	3	3.0	8	8.1	37	37.4	1.29	0.76	LS	12
Severe weather fluctuation	22	22.2	64	64.6	3	3.0	2.21	0.70	S	4
<b>Health risks</b>										
Accumulation of dungs	34	34.3	14	14.1	10	10.1	2.41	0.88	S	3
Disease outbreak	45	45.5	29	29.3	5	5.1	2.51	0.79	S	1
Parasite	8	8.1	23	23.2	40	40.4	1.55	0.83	LS	9
Lack of veterinary services	23	23.2	53	53.5	5	5.1	2.20	0.74	S	5
Accident	2	2.0	6	6.1	20	20.2	1.36	0.79	LS	11
Failed vaccine	1	1.0	14	14.1	7	7.1	1.72	0.74	LS	7
<b>Marketing risks</b>										
Severe price fluctuation of birds	4	4.0	12	12.1	54	54.5	1.29	0.75	LS	12
Severe price fluctuation of products	5	5.1	9	9.1	52	52.5	1.29	0.78	LS	12
Transportation problems	22	22.2	33	33.3	21	21.2	2.01	0.87	S	6
Rotting of eggs at storage	5	5.1	9	9.1	13	13.1	1.70	0.88	LS	8
<b>Insecurity risks</b>										
Death of birds	4	4.0	12	12.1	21	21.2	1.54	0.83	LS	10
Theft	1	1.0	2	2.0	13	13.1	1.25	0.76	LS	16
<b>Production risks</b>										
Poor parent stock	33	33.3	5	5.1	12	12.1	2.42	0.93	S	2

Freq. = Frequency, S = Severe, LS = Less severe

#### Coping Strategies Practiced by the Respondents

The coping the strategies practised by the respondents are presented in Table 4. About 37% of the farmers dewormed their birds, 82.2% adopted culling of birds, 45.5% practised vaccination, 71.7% debeaked their birds, 91.9% used constant water supply while 80.8% adopted the use of quarantine. Other methods of coping with risks and uncertainties adopted by the farmers were caponizing (11.1%), Constant feeding (46.5%) dubbing (4.0%) and wind-breakers (9.1%).

**Table 4:** Coping Strategies Practiced by the Respondents (n = 99)

Coping strategies	*Frequency	Percentage
Deworming	37	37.4
Culling	82	82.2
Vaccination	45	45.5
Debeaking	71	71.7
Dubbing	4	4.0
Constant feeding	46	46.5
Caponizing	11	11.1
Quarantine	78	78.8
Wind-breaker	9	9.1
Disinfectant	80	80.8
Constant water supply	91	91.9

Note: \* Multiple response

#### DISCUSSION

##### Socio-economic Characteristics of the Poultry Farmers

The socio-economic profile of the respondents showed that there were more male in poultry production than the female in the study area. This could be attributed to the tedious nature of poultry production particularly in the aspect of management. The age profile of the farmers shows that 93.9% of the farmers were still in their active age. This is also supported by the mean age of 43years obtained in the study. Thus, the bulk of the farmers were still energetic and should be enterprising, which according to Falola *et al.* (2012) has a lot of positive implications for agricultural production. *Ceteris paribus*, these farmers should be able to accept farm innovations more easily and vigorously than their aged counterparts. As noted by Nwaru *et al.* (2010), the risk bearing abilities and innovativeness of a farmer, his mental capacity to cope with the daily challenges and demands of farm production activities and his ability to do manual decreases with advancing age. Majority of the farmers were married. This suggests that poultry farming is a means of making ends meet and catering for the family in the study area. This is in consonance with reports by Meyer and Boon (2003), Edeoghon and Oria-Arebutun (2011) and Falola *et al.* (2012).

Household size is an important factor in risk management by farmers. The household size reflects the consumption needs of household members and amount of family available for agricultural production as well as risk management activities. The larger the household size the higher the subsistence consumption need and given a limited amount of agricultural resources, the lower the willingness of the farmers to take risk (Ayinde, 2008). On the contrast, an average farmer first exhausts all sources of labour in his household before hiring labour in order to save cost of production (Muhammad-Lawal *et al.*, 2009). Thus, the mean household size of five persons obtained in the study indicates that family labour is less available in the study area.

The fact that most (98%) of the farmers had formal education and 73.7% of them had tertiary education likely suggests a high level of eagerness for risk management by the farmers. This is in line with the notion that well-educated producers have the human capital to more fully comprehend and utilize the nuances of effectively utilizing risk management strategies (Goodwin and Schroeder, 1994; Smith and Baquet, 1996; Mishra and El-Osta, 2002; Ayinde, 2008; Margerita *et al.*, 2009).

The number of years that farmers have in farming business can imply their extent of farming knowledge on how to cope with risks and uncertainties. As shown in Table 1, the farmers had been in poultry farming for an average of five years implying that these farmers are much likely to be knowledgeable on sources of risks to their operations. These farmers are also expected to be well acquainted with coping strategies to 'fight' the risks.

Majority of the farmers engaged in poultry farming on part-time basis. Survey revealed that 77.8% of the farmers majored in other activities such as civil service, crop production, carpentry, trading, bricklaying and so on. This pluriactivity by the farmers could result from the quest to improve household income and develop a standard well-being (Fuller, 1990; Evans and Ilbery, 1993; Fakayode *et al.*, 2011). Notwithstanding, pluriactivity minimizes the risk of specialization (Stark and Levhari, 1982). Thus the part-time poultry farmers may have a positive disposition to risk management through alternative sources of income. On the other hand, the full-time farmers would likely take and manage more risks in poultry than their part-time counterparts (Ayinde, 2008).

Distribution of the respondents according to their stock size shows that most of the poultry farms in the study area were in the small scale category. The farm size was classified following Omotosho and Oladele (1988), Subhash *et al.* (1999), Ojo (2003) and Olasunkanmi (2008), which classified farms having <1000 birds as small farms, 1000-3000 as medium farms while those having 3000 and above birds as large farms.

It is expected that household income will influence farmer's ability to manage risks positively. The mean monthly household income obtained in the study likely indicates a good ability of the poultry farmers to finance risk coping strategies. This however depends on other subsistence needs of the farmers as posited by Ayinde (2008).

Cooperatives and extension services are good means of disseminating of information on agricultural

management practices, including risk management strategies, awareness of technical know-how and provision of improved services. The result shows that majority of the farmers did have access to these variables, indicating that most of the farmers would not benefit from these services. This finding affirms previous studies which that farmers participation in cooperative societies and access to extension services are lacking in developing countries, including Nigeria (ICS-Nigeria, 2005; Budak *et al.*, 2010; Falola *et al.*, 2012).

#### Sources of Risks Encountered by the Farmers

Table 2 reveals that severe weather fluctuation was the main source of risks encountered by most of the farmers. This was followed by lack of veterinary attention, disease outbreak, transportation problems, parasites, severe price fluctuation of birds and fluctuation of price of price of poultry products (in order of farmers that were affected). Other sources of risks encountered by a good number of the farmers were accumulation of poultry dungs, poor parent stock, shortage of water and death of birds.

#### Level of Interference with Risks and Uncertainties by the Farmers

The results of the 3-point Likert scale on the level of interference of the farmers with risks (Table 3) shows that disease outbreak (mean = 2.51), poor parent stock (mean = 2.42), accumulation of poultry dung (M = 2.41), severe weather fluctuation (M = 2.21), lack of veterinary attention (M = 2.20) and transportation problems (mean = 2.01) were the severe risks faced by the farmers. Investigations revealed that some of the diseases usually encountered by the farmers were coccidiosis, aspergillosis, newcastle disease, cannibalism and infectious bronchitis. The farmers lamented that risk on disease outbreak was usually considered even before undertaking the poultry enterprise.

On the issue of poor parent stock, the respondents complained that sometimes, they had good set of chicks from the hatchery and the reverse was the case on other occasions. As regards accumulation of poultry dung, the poultry farmers affirmed that the crop farmers in the study area lack the technical know-how on use of poultry dung as organic manure. Those whose farms were close to residential areas also revealed that the poultry dung usually constituted environmental pollution in the communities, thus making it a risk in their operation. The respondents also asserted severe weather fluctuation was experienced in form of high temperature, delayed onset of rainfall and incidence of drought. This agrees with earlier findings by Falola *et al.* (2012) that climate change affects livestock production in the study area.

Lack of veterinary services was another severe risk encountered by the farmers. In the study area, veterinary personnel were lacking. Most of the farmers used to administer drugs and vaccines to their birds themselves. The fact that majority of the farmers did not have access to agricultural extension services (Table 1) could also exacerbate the level of lack of veterinary attention in the study area.

Table 3 also shows that transportation problems constituted a severe risk in the study area. Interview with the respondents revealed that the transportation problems in the study area include bad roads, inadequate fleets of

buses or trucks for conveyance of birds and their products.

### Coping Strategies Practiced by the Farmers

Table 4 shows that the major coping strategies practiced by the farmers were provision of constant water supply to birds, culling, use of disinfectant, quarantine and debeaking. Vaccination, caponization and deworming were only practiced by 45.5%, 37.4% and 11.1% respectively. This could result from the severe nature of lack of veterinary services experienced in the study area (Table 3). Inadequate access to extension services by the farmers (Table 1) may also explain why dubbing was less practised by the farmers.

### CONCLUSIONS

It can be inferred from the study that, poultry farming is practiced mainly by young, male individuals who are married, with high level of formal education. The poultry sector in the study area is made up mainly of small-scale farmers who engage in the farming on part-time basis, had little access to extension services and were not members of cooperatives. The major sources of risks encountered by the farmers were severe weather fluctuation, lack of veterinary services, disease outbreak, transportation problems, parasitization and severe price fluctuation of birds. The study further revealed that the severe risks encountered by the farmers were disease outbreak, poor parent stock, accumulation of dung, severe weather fluctuation, lack of veterinary services and transportation problems. Also, the coping strategies that involve veterinary attention were less practiced by the farmers. Based on the findings of this study, therefore, the following suggestions are offered in order to overcome the shortcomings in risk management strategies adopted by the poultry farmers.

Efforts should be made by government, non-governmental organizations and agricultural development agencies to overhaul extension services on risk management in poultry farming. Area of concentration by these agencies should include education of farmers on adaptation and mitigation strategies on severe weather fluctuation, poultry diseases and sources of good parent stock. Farmers could also be educated on the use of poultry dung for useful purposes, such as organic manure. This could enable the poultry farmers manage the risk on accumulation of dung. Also, attention should be paid by government and relevant stakeholders to provision of veterinary services in the area.

Besides, transportation facilities should be provided in the study area to make conveyance of birds and poultry products easy. This will entail the construction, expansion and maintenance of roads. Government should create a conducive environment that would encourage private vehicle owners to set up commercial transportation services. Duties on new vehicles and spare parts should be reduced to make them affordable to intending transporters.

Moreover, access to improved market information for effective arbitrage should also be provided by instituting a unit in the local government authority and state Ministry of Agriculture (in collaboration with research agencies and universities) to collect, analyze and disseminate timely information on prices, demand and supply situation of birds. This could be through radio, newspapers and

bulletins. This will assist the farmers in managing price fluctuation of birds.

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