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AN ASSESSMENT OF RISK MITIGATING STRATEGIES EMPLOYED BY POULTRY FARMERS IN KADUNA METROPOLIS OF KADUNA STATE, NIGERIA: ATTITUDINAL SCALE APPROACH

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ABSTRACT

The study focused on the mitigating strategies amongst poultry farmers in Kaduna Metropolis of Kaduna State, Northern Nigeria. Specifically, the study identified the mitigating strategies used by poultry farmers in the study area. A multi-stage sampling procedure was used to select 130 farmers. Primary data were collected using structured questionnaire and analysed using attitudinal scale approach. The result of the farmers risk attitude showed that 70% of them were categorized among probable risk averse individual. It was also observed that the risks mitigation strategies employed by the farm households in the study area were preventive medical treatment, quarantines / building rotation, off-farm income as important source of household income, birds from safe and known supplier, feed from safe and known source, diversification which accounted for a coefficient alpha for the 27 statements to 86%. The study established a high degree of risk aversion as revealed by the adoption of such risk mitigating strategy like water from safe and known source, no or controlled access to visitors, wash hand before/after handling, Not allow contact between poultry and wild birds. Hence, there is a strong tendency on the part of the farmers to mitigate the production risks at farm level by adapting appropriate measures. It is therefore, recommended that financial institutions should encourage collaboration with the insurance companies to insure agricultural credit facilities to indirectly insure poultry farms due to inevitable risk involve in poultry farming business and also government and private insurance companies should consider developing insurance product for poultry farmers to patronize and use as shock absorbers against uncertain events.

Keywords: Assessment; Risk; Mitigating Strategies; Poultry Farmers

INTRODUCTION

The poultry industry plays important roles in the development of Nigerian economy. It is a major source of eggs and meat which have a high nutritional value particularly in the supply of protein. Eggs are also important in the preparation of confectionary and vaccines. The poultry industry also provides employment opportunities for the populace, thereby serving as a source of income to the people (Akanni, 2007). The poultry industry is of considerable economic relevance because it serves as a source of food, income, employment and poverty alleviation (Bosnjak and Rodic, 2008; Hodges, 2009).

The Nigerian poultry sector experiences many problems such as a rise in the price of feed, avian influenza, floods, fire, the global financial crisis and inadequate credit, the poultry sector is characterized by a low level of production specialization, (FOA, 2006, Bello 2011). The events

of a number of periods of price uncertainty and movement (volatility) have caused companies to fall into bankruptcy, farmers leaving the business, farmers falling into semi-permanent poverty traps and consumers to face spiralling costs for food and consequently, decline in the growth of the poultry sector (Adeyemo and Onikoyi, 2012).

In agriculture, farmers express their risk mitigation in diverse ways, some of which are forward pricing, production practices, insurance, holding liquid reserves, diversification, and liability management or their combination, (Adejoro, 2000). Generally, these ways of risk mitigation have commanded substantial resources from farmers and researchers. In Nigeria, however, most poultry farms are small scale with little opportunity for diversification and insurance. Their attitudes to risk are nevertheless major determinants of the rate of diffusion of new technologies among the farmers and of the outcome of rural development programmes (Tonye *et al.*, 1977; Adejoro 2000). In developing countries, farmers also lack access to both modern instruments of risk management—such as agricultural insurance, futures contracts, or guarantee funds—and ex post emergency government assistance. Such farmers rely on different "traditional" coping strategies and risk-mitigation techniques, but most of these are inefficient (Wenner, 2010).

Farmers' risk attitudes can be divided into three general types:

i. Risk averse.
ii. Risk preferring.
iii. 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 choice 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.

Production risk occurs because agribusiness enterprise is affected by many uncontrollable events that are often related to weather such as unlimited rain or drought, diseases and pests (especially in poultry business), random physical hazards and technological failure of the production process. Yield variability has an effect on the goal of meeting rising aggregate demand and on price and market stability (Aneke, 2007). It leads to unstable farmer income,

unstable household food production, variable supplies and prices to consumers. All these risks collectively affect the farmers' technical and profit efficiency (Barry and Baker, 1984; Bauer and Bushe, 2003; Aneke, 2007) thus they need to be managed. Farm size, age, innovativeness and risk aversion determine the choice of risk management strategy by farmers (Pennings *et al*., 2008). The identification of the sources of risk is important because it helps to choose the appropriate management strategy

More concrete risk management strategies can be grouped into three categories (Holzmann and Jogersen, 2001): prevention strategies to reduce the probability of an adverse event occurring, mitigation strategies to reduce the potential impact of an adverse event, and coping strategies to relieve the impact of the risky event once it has occurred. Prevention and mitigation strategies focus on income smoothing, while coping strategies focus on consumption smoothing. Strategies can be based on arrangements made at different institutional levels: farm household or community arrangements, market based mechanisms and government policies.

Risk and uncertainty is an inherent feature of modern poultry production. The poultry production decision environment is characterized by risk and the absence of perfect and complete information. The poultry industry in Nigeria has suffered a great deal of losses which affects poultry farmers as well as consumers (Ogoke, 2009). It should be emphasized that many poultry farmers in Nigeria are less equipped to mitigate risks associated with production, consumption, income, assets and their health. This could lead to eventual collapse of poultry industry if intensive and collaborative efforts are not made by government and stakeholders to salvage the situation (Abimbola, *et al.,* 2009). In particular, the failure to rise up to this challenge to saving the industry could lead to a serious reduction in poultry production and protein intake of people. This results into malnutrition and ill health, lower productivity and output (Bamiro *et al.,* 2009). The need for the management of risk and uncertainty associated with poultry production will be better appreciated when it is realized that 70% of the Nigerian population are farmers (Ekong, 2010). These farmers do not have the understanding of risks and uncertainties as well as risk management skills or approach to manage problems and reduce consequences of risks and uncertainties. The study therefore, assess the risk mitigating strategies employed by poultry farmers in Kaduna State, Nigeria. Specifically to assess risk mitigating strategies employed by poultry farmers, the attitudinal scale approach (ASA) was used to collect their responses.

MATERIALS AND METHOD

The Study Area

The study was conducted in Kaduna State. The State lies between latitudes 11°32 and 09°02 N and longitudes 08°50 and 06°15 E (FOS, 1996). Kaduna state shares boundaries with Katsina and Kano states to the north, Plateau State to the north east, Nassarawa and Abuja to the south, and Niger and Zamfara States to the west (KADP, 2012). The State occupies an area of approximately 48,473.2 square kilometres and has a projected population of 6.67 million based on annual population growth index of 3.2% (NPC, 2006). The projected population for 2014 is 8377520 based on annual population growth index of 3.2%. Involvement in small, medium and large – scale livestock production such as rearing of chickens, ducks, goats, sheep and pigs as well as marketing of their products are predominant in the State. The people live mostly in organized settlements, towns and cities (NBS, 2005).

Sampling Procedure

A multi-stage sampling technique was used to select the sample. First stage, two local governments from the twenty three Local Government Areas in Kaduna State were purposively selected, based on the number of registered poultry farmers in the state. These are Kaduna south and Kaduna north local governments. Second stage, purposive selection of five and four districts each from the two LGAs (Kaduna South LGA and Kaduna North LGA) respectively, based on the number of poultry producers in the respective villages. These are Ungwan Rimi, Ungwan Sarki, Kawo, and Ungwan Liman for Kaduna North LGA, while Television, Barnawa, Kakuri (Kurmin Gwari), Kurmin mashi and Tudun Wada for Kaduna South LGA. The pre–study visit to the respective study areas informed the population of 327 registered producers (both broiler and layers) out of which a sample size of 130 respondents (70 farmers, from Kaduna South and 60 farmers from Kaduna North) were randomly drawn from poultry producers in the study area. The difference in sample size between the two LGAs is because of the unequal population of poultry producers in the two LGAs. These two Local Government Areas were selected because of their high level of involvement in poultry farming (Emaikwu K. K *et al*., 2011).

Methods of Data Collection

Primary data were used for this study. These were collected with the aid of structured questionnaire. Information was collected on the poultry farmer's responses to each of the statements correspond to the socio-psychological attribute and his rating of the item conveys his attitude towards risk, based on his proclivity to adopt the particular risk management tool that the item reflects.

Analytical Techniques

Attitudinal Scale Approach was used to assess the risk mitigating strategies employed by poultry farmers in the study area.

Attitudinal Scale Approach (ASA)

An aggregate score based on farmer's responses to a total of 32 statements (items), each representing a risk management tool in poultry farming was estimated. The responses to each of the statements correspond to the socio-psychological attribute of the individual farmer and his rating of the items conveys his attitude towards risk, based on his proclivity to adopt the particular risk management tool that the item reflects. This methodology of developing a risk attitudinal scale was used by Bard and Berry (2000), Lagerkvist (2005) and Meuwissen *et al* (1999). The underlying assumption in this method of measuring the risk attitude is that if attitude towards risk is a determinant of risk management strategy adopted by the farmers, the farmer's response to specific risk management tool was an indicator of their risk attitude. The respondent's rating of the items were summed up to yield an aggregate score for the respondent, which was a quantitative measure of his attitude. The responses were measured on a 5-point scale. Strongly disagreement (score of 1) implied the willingness of farmer to adopt the risk Management practice is negative. On the other hand, strong agreement (score of 5) indicated that a risk taking attitude is positive. In-between the two extremes, disagreement (score of 2), undecided/neutral (Score of 3) and agreement (score of 4) were included as alternative responses. Thus, a lower total for the respondent is then hypothesized to correspond to higher degree of risk aversion. While administering the schedule, both positive and negative statements were included to avoid response bias.

RESULTS AND DISCUSSION

The perceived risk attitude of the poultry farmers in the Study Area

A set of 32 statements put before the farmers to ascertain their risk attitudes and the mean score of each statement for each category of farmers, and also for all categories combined are given in Table 1. The statements are negatively worded and the scoring of options were done in such a way that the option of strongly disagreeing got a score of 1, while that of strongly agreeing was assigned a score of 5. Thus, the lower the score for an individual statement, more likely the farmer is going to adopt or utilize the risk management tool that the statement reflects, due to his risk-averse attitude.

Poultry farm households in Kaduna Metropolis face numerous natural, market and institutional risks in generating means of survival. Yield risk, price risk and risk of unready market, risk of illness and injuries are common risks prevalent in poultry farming business. As a result, farm households' economic decisions are overshadowed by risk. Their attitude towards risk, therefore, tends to display an explanation for the many observed economic decisions. Knowledge of farmers' attitude toward risk has important implications for the adoption of new production technologies and the success of rural development programmes (Wik and Holden, 1998; Grisley and Kellog, 1987).

Result from Table 1, the result showed that 70.1% of the respondents were categorized among probable risk averse individual, while, 6.9% of the respondents were categorized as neutral to risk and 23.0% of the respondents were categorized as risk preference individual. This findings agrees with the findings of Dadzie and Acquah (2012) who reported that majority (67.5%) of the farmers had risk-averse attitude and few (10.0%) had risk-taking attitude. Also almost one-fourth of the farmers had risk-neutral decision behaviour. In production decision under risk, most of the farmer's decision behaviour is inconsistent with allocative efficiency on production value such that if that value occurs, the largest possible profit could be obtained and if otherwise, a substantial loss would be incurred (Ellis, 2000). Thus most poultry farmers interviewed either would not prefer to take a chance at the possible profit though it may have a probability of happening than taking a safer position with a lesser possibility of incurring a large loss; or would prefer to operate in position consistent with the average outcome of 'good' and 'bad' happening together. Similarly, the findings of Ayinde *et al*. (2008) stated that many farmers are not risk averse as it been reported in literature.

Table 1: Distribution of aggregate score measuring risk attitude of the respondents

Probable Risk Category	Frequency	Percentage (%)
Risk Aversion(32<=Ya<=95)	91	70.1
Risk Neutral(Yn=96)	9	6.9
Risk Preference (97<=Yp<=160)	30	23.0

Mitigating Strategies used by Poultry Farmers.

Results from Tables 2 presents each statement's corrected item-scale correlation, the coefficient alpha calculated with that particular statement excluded from the scale of the remaining 27 statements, and the overall coefficient alpha for all 32 statements. The overall coefficient alpha of

0.787 indicates that the 32 statements account for 78% of the total variation. The overall coefficient alpha of 0.863 indicates that the 27 statements account for 86% of the total variation. This value is much higher than the minimally acceptable alpha value of 0.65 as proposed by Devillis (1991). This value of the coefficient alpha 0.86 indicates that a communal variation of 86% is caused by risk attitudes, which is higher than what were reported by Bard and Berry, 2000, (69%) and Lagerkvist, 2005 (83%).

Thus, risk mitigation strategies such as preventive medical treatment, quarantines / building rotation, off-farm income, young animals from own breeding, birds from safe and known supplier, feed from safe and known source, diversification, disinfection of premises, keep extra cash at hand for emergencies, attending workshops on poultry, proper ventilation of houses, use of saw dust in beddings and appropriate nutrition were utilized as valid risk mitigation strategies among the poultry farmers in the study area.

Table 2: Reliability Testing of Attitude

Statements-items	**Corrected Item Scale (CIS)**	**Cronbach's Alpha(α)**
1.I do not use Preventive medical treatment	0.448	0.781
2.I never Quarantines / Building rotation	0.502	0.771
3.Young animals from own breeding is important	0.324	0.780
4.Birds from safe and known supplier	0.667	0.771
5.I do Diversification (practising poultry with other livestock farming)	0.157	0.787
6.I do not keep live in-dead out	0.430	0.774
7.Off farm income is not important	0.522	0.769
8.I never Insure my poultry birds	0.677	0.763
9.I never take Future market	0.514	0.770
10.Separation of birds by age is not important	0.200	0.786
11.Separation of birds by species is not important	0.430	0.774
12.I get my feed from safe and known source	0.085	0.791
13.I do not disinfect my poultry premises	0.078	0.787
14.Changing shoes when entering is not important	0.469	0.772
15.Attending extension workshops on poultry	0.187	0.785
16.Production of feed by self is never done	0.143	0.786
17.I keep extra cash at hand for emergencies	0.210	0.784
18.I never have steady market/Integrator or distributor	0.593	0.769
19.I avoid overcrowding	0.307	0.781
20.Proper ventilation of housing is needed	0.765	0.763
21.Locating poultry house away from residential buildings	0.369	0.779
22.Proper record keeping is important	0.605	0.768
23.Use of saw dust in beddings is not important	0.539	0.772
24.Rodent and pest control is not important	0.391	0.776
25.Clean/disinfection of all crates used in poultry farms	0.088	0.791
26.Appropriate nutrition in feeds is not important	0.521	0.769
27. Others	0.420	0.764
Coefficient Alpha for the entire 32 statements		0.789
Coefficient Alpha for the entire 27 statements		0.863

CONCLUSION AND RECOMMENDATIONS

The study established a high degree of risk aversion as revealed by the adoption of such risk mitigating strategy like water from safe and known source, no or controlled access to visitors, wash hand before/after handling, Not allow contact between poultry and wild birds. Hence, there is a strong tendency on the part of the farmers to mitigate the production risks at farm level by adapting appropriate measures. Although some poultry farmers were found to be risk- neutral and risk-preferring. It is therefore, recommended that financial institutions should encourage collaboration with the insurance companies to insure agricultural credit facilities to indirectly insure poultry farms due to inevitable risk involve in poultry farming business and also government and private insurance companies should consider developing insurance product for poultry farmers to patronize and use as shock absorbers against uncertain events.

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