Research in: Agricultural & Veterinary Sciences
Vol.1, No.3, 2017, pp.163-171

PERCEIVED EFFECTS OF CLIMATE CHANGE ON COMMERCIAL POULTRY FARMING IN OYO STATE, NIGERIA

G.L. Adebisi[1*], L.A. Oyebode[2], I.I. Owosibo[3]

[1]Federal College of Animal Health and Production Technology, Moor Plantation, Ibadan, Nigeria
[2]Department of Agriculture, Wesley University, Ondo, Ondo State, Nigeria
[3]Federal College of Agriculture, Moor Plantation, Ibadan, Nigeria

Abstract. This study assessed the perceived effects of climate change on poultry farming among commercial poultry farmers in Oyo State. Simple random sampling technique was used to select 120 commercial poultry farmers among the registered poultry farmers association of Nigeria and data were collected through the use of questionnaires which were analyzed using descriptive and inferential statistics. Results reveal that majority (90.8%) of the respondents were married, male (87.5%) and had tertiary education (61.7%). Source of information on climate change among the respondents was television (87.5%) and their level of knowledge on effects of climate change on poultry farming was high (70.0%). Perceived effects of climate change on poultry farming among commercial poultry farmers were on the high side of which many of them affirmed that climate change decreases the feed intake of poultry birds (97.6%), causes dehydration of the birds (91.7%), reduces poultry fertility (90.9%) and increases water intake of the bird (90.8%). At 0.05 level of significant, there was a significant relationship between the respondents age (r=0.242; p=0.004); knowledge of climate change (r= -0.465; p=0.001); level of education (X2=4.245; p=0.007) and perceived effects of climate change. Based on the foregoing it is recommended that training workshops should be organized among the farmers on how best they can cope with the effects of climate change and improve technology that is simple and compatible with environmental factors should be developed.

Keywords: *perceived effects, climate change, commercial, poultry farming.*

Corresponding Author: *G.L. Adebisi, Federal College of Animal Health and Production Technology, Moor Plantation, Ibadan, Nigeria, Tel.: (+977)+2348067093595, e-mail: adebisigbadebo2014@gmail.com*

Manuscript received: *8 May 2017*

1. Introduction

Poultry are birds that include fowl, turkey, duck, goose, ostrich, guinea fowl which render not only economic services but contribute significantly to human food as a primary supplier of meat, egg, raw materials to industries, source of income and employment to people compared to other domestic animals [5]. Poultry play important economic, nutritional and socio-cultural role in the livelihood of households in many developing countries, the return on investment is high and the production cost per unit is low when compared to other types of livestock, but greater losses result from low feed intake and a less efficient conversion of feed to meat which consequently affects the poultry health and productivity. According to [9], climate change determines the level of feed intake of the birds because ingestion of food is directly related to heat production and any change in feed intake and energy density of the diet will change the

amount of heat produced by the birds and this will automatically affect the growth of animal thereby causing low income for the farmers.

Elijah and Adedapo (2006) [7], further asserted that the environmental conditions affecting the performance, health and productivity of poultry include temperature, relative humidity, light, sunshine prevailing at a given time, housing system and ventilation. It was further reported in his study that high rainfall and relative humidity provides conducive environment for breeding of parasites that causes outbreak of diseases which invariably reduces egg production.

Poultry flocks are particularly vulnerable to climate change because there is a range of thermal conditions within which animals are able to maintain a relatively stable body temperature in their behavioral and physiological activities, hence birds can only tolerate narrow temperature ranges to sustain the peak of their production for human consumption and any unpredictable climatic change will therefore trigger a series of adjustment and readjustments by poultry birds in the struggle for survival which may have negative consequence on the viability of poultry production.

The issue of climate change has become more threatening not only to the development of socio-economic and agricultural activities of any nation but to the totality of human existence [1]. Climate change is the primary determinant of various agriculture productivity and its adaptive capacities and knowledge are low [3]. Many African countries, which have their economies largely based on weather-sensitive agriculture productions like Nigeria's, are particularly vulnerable to climate change [6].

Climate change is the most severe problem that is been faced by poultry farmers in this present day, it exposes the birds to tough weather situation especially drought, poor quality feed ingredient, exposure to diseases, pest and other environmental dangers [4]. Poultry farming is a notable means of livelihood among household in Nigeria, thus, challenges posed by climate change cannot be neglected to ensure sustenance of the this venture.

It is important and imperative to assess the effects of climate change because it has been recognized that people mostly make decision about their environment based on how they perceive it. The perception of poultry farmers on climate change has the tendency of influencing their coping strategies which ultimately determine the extent to which climate change impacts their productivity [2]. The issue of impact of climate change on poultry farming is also important considering the fact that agriculture is the mainstay of about 60-70% of the Nigerians, in which poultry farming represent a reasonable percentage [3]. The consequence of climate change as it was stated above is worrisome to many farmers in Africa and it is on this premise that the research was carried out in Oyo State, Nigeria.

2. Objectives of the study

The broad objective of this study is to assess the perceived effects of climate change on commercial poultry farming in the study area while the specific objectives were to:

- describe the socio-economic characteristics of the respondents.
- determine the enterprise characteristics of the respondents
- identify the respondents' source of information on climate change.
- ascertain the knowledge of the poultry farmers on climate change.

- assess the perceive effects of climate change on commercial poultry farming.

3. Methodology

The study was carried out in Oyo state, South-Western Nigeria. It is bounded in the north by Kwara State, in the East by Osun State, in the South by Ogun State and in the West partly by Republic of Benin. The study area is located between latitude 7045N, longitude 4015E and it covers a total land area of 28.454 square kilometers.

The climate is equatorial, notably having dry season and wet season, relatively high humidity and average daily temperature ranges between 25^0C (77^0F) and 35^0C (95^0F), almost throughout the year. The study population consists of registered poultry farmers in Oyo State, these are members of poultry farmers association of Nigeria (PAN) Oyo State. Out of 320 registered poultry farmers, 120 members were sampled using simple random giving a total sample size of 120 respondents. Data was collected using interview schedule while descriptive and inferential statistics were used in data analyses and interpretation.

4. Results and Discussion

Respondents socio-economic characteristics

Table 1 shows data on the socio-economic characteristics of commercial poultry farmers. Results indicate that majority of the respondents (70.8%) were within the age range of 41-55 years and are male (87.5%). It was also indicated that majority of the respondents (90.8%) were married, and practice Christianity as religion (73.3%) and level of education they attained was tertiary education (61.7%). Finding also revealed that 67.5% of the respondents had average monthly income of ₦171,033.33with 64.2% of them had between 5-7 persons in their families.

Table 1. Socio-economic characteristics of the respondents

Variables	Frequency	Percentage	Mean
AGE (Years)			
<25	2	1.7	
26-40	17	14.2	49.53
41-55	85	70.8	
>55	16	13.3	
SEX			
Male	105	87.5	
Female	15	12.5	
MARITAL STATUS			
Single	2	1.7	
Married	109	90.8	
Divorced	6	5.0	
Widowed	3	2.5	
RELIGION			
Islam	30	25.0	

Christian	88	73.3	
Traditional	2	1.7	
EDUCATIONAL LEVEL			
No Formal Education	4	3.3	
Primary Education	9	7.5	
Secondary Education	33	27.5	
Tertiary Education	74	61.7	
INCOME/MONTH (₦)			
<90,000	3	2.5	
90,000-120,000	16	12.5	
120,001-150,000	15	12.5	
150,001-180,000	6	5.0	
>180,000	81	67.5	#171033.33
HOUSEHOLD SIZE			
2-4	29	24.2	
5-7	77	64.2	
8-10	14	11.6	

Respondents enterprise characteristics

The result in table 2 shows that 64.2% of the respondents had 17 to 22 years of poultry experience, 57.5% of them had flock size ranging between 3001 to 3501 and poultry species engaged with were chicken (88.3%). It was also indicated from the results obtained that 90.8% of the respondents engaged in the use of battery cage system for poultry keeping, their source of labour were paid labour (91.7%) while their source of finance was through bank (75.0%).

Table 2. Enterprise characteristics of the respondents

Production Enterprise	**Frequency**	**Percentage**	**Mean**
FARMING EXPERIENCE (YEARS)			
>5	4	3.3	
5-10	16	13.3	
11-16	12	10.0	
17-22	77	64.2	
>22	11	9.2	13.48
FLOCK SIZE			
1500-2000	11	9.2	
2001-2500	19	15.8	
2501-3000	21	17.5	
3001-3501	69	57.5	

POULTRY SPECIES		
Chicken	106	88.3
Turkey	2	1.7
Quail	1	0.8
Chicken and Turkey	11	9.2
REARING SYSTEM		
Battery Cage	109	90.8
Deep Liter & Battery Cage	11	9.2
SOURCES OF LABOUR		
Family Labour	10	8.3
Paid Labour	110	91.7
SOURCES OF FINANCE		
Self	22	18.3
Family Member	8	6.7
Bank	90	75.0

Respondents sources of information on climate change

Table 3 shows the respondents sources of information on climate change. Majority of the respondents (87.5%) indicated television was source of the information on climate change, radio (85.8%), fellow farmers association (77.6%), newspaper and internet (68.3%) respectively. The implication of this result shows that majority of the respondents are literates.

Table 3. Sources of information on climate change

Sources	**Yes** **F (%)**	**NO** **F (%)**
Radio	103(85.8)	17(14.2)
Television	105(87.5)	15(12.5)
Fellow Farmers Association	93(77.6)	27(22.5)
Newspaper	82(68.3)	38(31.7)
Agricultural Extension Agents	45(37.5)	75(62.5)
Friends	40(33.3)	80(66.7)
Internet	82(68.3)	38(31.7)

Knowledge of climate change by the respondents

Knowledge of climate change by the respondents is presented in Table 4. Majority of the respondents were of the opinion that climate change is about change in timing of

rains or periods of rain (93.3%), climate change is about increase in the number of days of dry spell (90.0%), increase in the number of hot days during dry season (85.0%), delay in rainfall season can't be attributed to climate change (84.2%), climate change brings about planet warms (81.7%) and climate change is about changes in turning of warming (80.0%).

Table 4a. Knowledge of climate change by the respondents

Statements	**Yes** F (%)	**No** F (%)
Climate change is about increase in the number of days of dry spell	108(90%)	12(10%)
Climate change is about change in timing of rains or periods of rain	112(93.3%)	8(6.7%)
A delay in rainfall season cannot be attributed to climate change	101(84.2%)	19(5.8%)
Changes in timing of warning	96(80%)	24(20%)
A shorter rainfall season	93(77.5%)	27(22.5%)
Increase in the number of hot days during dry season	102(85%)	18(15%)
Decrease in the number of hot days during rainy season	89(74.2%)	31(25.8%)
Climate change is about unpredictable season	86(71.7%)	34(28.3%)
Climate change is never about rainfall patterns shift	92(76.7%)	28(23.2%)
Climate change is about increase or decrease in temperature compared to previous years	98(81.7%)	22(18.3%)
Climate change brings about planet warms	75(62.3%)	45(37.7%)
Climate is about normal rainy season and dry season	87(72.5%)	33(27.5%)
Unchanged in a new climate state	86(71.7%)	34(28.3%)

Respondents level of knowledge on climate change

The result of the analysis on the farmers level of knowledge on climate change revealed that 70.0% of the respondents have high knowledge of climate change while 30.0% of the respondents have low knowledge of climate change. The level was measured by scored the correct response one (1) and incorrect response zero (0), the minimum score was six (6) and maximum score was thirteen (13) with a mean score of 10.8.Respondents with a mean score below 10.8 were categorized as having low level of knowledge about climate change and respondents with a mean score of 10.8 and above were categorized as having high level of knowledge about climate change.

Table 4b. Respondents level of knowledge on climate change

Variables	**Frequency**	**Percentage**	**Minimum**	**Maximum**	**Mean**
Low	36	30.0	6.00	13.00	10.8
High	84	70.0			
Total	**120**	**100.0**			

Perceived effects of climate change on commercial poultry farming

Respondent's perception about the effect of climate change on poultry farming was measured by presenting perceptional statements on a 5 point scale to them and the weighted mean were determined. Result analysis on table 5 shows that majority of the respondents affirmed that climate change decreases the feed intake of poultry birds (97.6%), causes dehydration of the birds (91.7%), reduces poultry fertility (90.9%), increases water intake of the bird (90.8%), increases cost of production (83.3%), reduces hatchability of eggs (80.0%), alters appropriates timing of rearing the birds (79.2%). The implication of these results signified that perceived effects of climate change on poultry production is unfavourable.

Relationship between respondent's socioeconomic characteristics and their perceived effects of climate change

Table 6 shows the relationship between socio-economic characteristics of the respondents and their perceived effects of climate change. The result reveals that age (r=0.242; p=0.004); level of education (X2=4.245; p=0.007) were significant to perceived effects of climate change on poultry farming. This implies that as the age increases the experience of farmers on the effects of climate change is increasing, however the level of education help the farmers to have a better understanding of effects of climate change on their enterprise.

Table 5. Perceived Effects of Climate Change on Commercial Poultry

Statement	Strongly Agree	Agree	Undecided	Disagree	Strongly disagree	Weighted Mean
It causes dehydration of the birds	69(57.5%)	41(34.2%)	6(5.0%)	2(1.7%)	2(1.7%)	1.55
Climate change increases water intake of the poultry birds	58(48.3%)	51(42.5%)	7(5.8%)	3(2.5%)	1(0.8%)	1.65
It decreases the feed intake of the poultry birds	75(62.4%)	42(35.2%)	2(1.7%)	1(0.8%)	0(0%)	1.66
Climate change alter appropriate timing of rearing of the birds	36(30.0%)	59(49.2%)	10(8.3%)	10(8.3%)	5(4.1%)	3.93
Climate change causes water stress	45(37.5%)	45(37.5%)	15(12.5%)	4(3.3%)	11(9.2%)	2.09
It affects the rearing pattern of the birds	37(30.8%)	68(56.7%)	11(9.2%)	3(2.5%)	1(0.8%)	4.14
It increases the cost of production	45(37.5%)	55(45.8%)	10(8.3%)	7(5.8%)	3(2.5%)	1.90
Intense heat reduces potency of vaccines in poultry	45(37.5%)	59(49.2%)	2(1.7%)	4(3.3%)	10(8.3%)	1.71
Climate change brings about cold related infection in	50(41.7%)	51(42.5%)	10(8.3%)	5(4.1%)	4(3.3%)	1.85

poultry birds						
Climate change brings about poultry vices such as cannibalism, pecking, feather pulling, heat stroke	56(46.7%)	41(34.2%)	15(12.5%)	4(3.3%)	4(3.3%)	1.83
It reduces poultry fertility	41(34.2%)	68(56.7%)	10(8.3%)	1(0.8%)	0(0%)	1.76
It reduces hatchability of eggs	37(30.8%)	59(49.2%)	5(4.1%)	15(12.5%)	4(3.3%)	2.88

Table 6. Relationship between the respondents socioeconomic characteristics and their perceived effects of climate change

Variables	**r-value**	**X^2**	**Df**	**p-value**	**Remark**
Age	0.242			0.004	S
Sex		1.168	1	0.524	NS
Marital status		3.184	3	0.317	NS
Level of education		4.245	3	0.007	S
Religion		2.172	2	0.265	NS

Relationship between the respondents knowledge of climate change and their perceived effects

Result in table 7 shows that significant relationship exist between the respondents knowledge of climate change and their perceived effects (r=0.465; p=0.001).This means that the knowledge the respondents have on climate change determine their perception of effects of climate change on poultry production that is the more the knowledge the greater the perception of effects of climate change.

Table 7. Relationship between the respondents knowledge of climate change and their perceived effects.

Variable	**r-value**	**p-value**	**Remark**
Knowledge	0.465	0.001	Significant

5. Conclusion

This study assessed the perceived effects of climate change on commercial poultry farming in Oyo state and it was revealed that majority of the respondents are male, married and attained tertiary education. The species of poultry they engaged with is chicken with the use of television as their source of information on climate change. Majority of the respondents have high knowledge of climate change and the perceived effects of it is unfavorable. Significant relationship exists between the respondent's age, level of education, knowledge about climate change and the perceived effects.

Recommendations

- Training workshops should be organized among the farmers on how best they can cope with the effects of climate change.
- Commercial poultry farmers should be educated more on other species of poultry production as against the chicken that is more prominent in the areas of study.
- Government should intensify more efforts in assisting commercial poultry farmers through agricultural extension services in most of their agricultural programs most especially the mitigation of effects of climate change on agriculture and adaptation strategy to employ.
- Women farmers should be encouraged to partake in poultry farming business to promote gender equity and eliminate gender biasness.
- Improve technology that is simple and compatible with environmental factors should be developed.

References

1. Adejuwon, S.A. (2004, September). Impacts of climate variability and climate change on crop yield in Nigeria. In *stakeholders' workshop on assessment of impacts and adaptation to climate change Obafemi Awolowo University, Ile-Ife, Nigeria*.
2. Ajadi, B.S., Adeniyi, A., Afolabi, M.T. (2011). Impact of climate change on urban agriculture: a case study of Ilorin city, Nigeria. *Glob. J. Human Soc. Sci*., 11(1), 25-29.
3. Apata, T.G., Samuel, K.D., Adeola, A.O. (2009, August). Analysis of climate change perception and adaptation among arable food crop farmers in South Western Nigeria. In *Contributed paper prepared for presentation at the international association of agricultural economists' 2009 conference, Beijing, China, August 16* (Vol. 22, p. 2009).
4. Atteh, J.O. (2004). Principle and practice of livestock protein feed manufacturing Adlek printer, 9.
5. Demeke, S. (2004). Egg production performance of local and White Leghorn hens under intensive and rural household conditions in Ethiopia. *Livestock Research for Rural Development*, *16*(2).
6. Dinar, A., Hassan, R., Kurukulasuriya, P., Benhin, J., Mendelsohn, R. (2006). *The policy nexus between agriculture and climate change in Africa. A synthesis of the investigation under the GEF/WB Project: Regional climate, water and agriculture: Impacts on and adaptation of agro-ecological systems in Africa* (No. 39). CEEPA Discussion Paper.
7. Elijah, O.A., Adedapo, A. (2006). The effect of climate change on poultry productivity in Ilorin, Kwara State, Nigeria, *International Journal of Poultry Science*, 5(11), 1061-1068.
8. Omotayo, A.M. (2010). *The Nigerian Farmer and the Elusive Crown*. University of Agriculture, Abeokuta.