

CLIMATE CHANGE AND ITS EFFECTS ON POULTRY PRODUCTION IN ETSAKO WEST LOCAL GOVERNMENT AREA, AUCHI, EDO STATE

^{1*}Abu, Maliki and ²Ajiyo, Oladimeji J.

¹Department of Agricultural Technology, Auchi Polytechnic, Auchi, Edo State

²Department of Agricultural Extension and Management, Auchi Polytechnic, Auchi, Edo State.

Corresponding Author: *abumaliki33@gmail.com

Abstract:

A research study was conducted to examine how climatic variations impact poultry farming operations within the Etsako West Local Government Area, Auchi, Edo State. The research methodology involved distributing one hundred and twenty structured survey instruments to poultry farm operators and associated stakeholders, who were selected through random sampling techniques. The collected information underwent analysis utilising frequency distributions and percentage calculations. The findings revealed that the majority of participants (85%) were male, with female respondents comprising 15% of the sample. Additionally, 76.67% of those surveyed were married and possessed post-secondary qualifications. The research demonstrated that most poultry operators recognised the substantial effects of elevated temperatures, alterations in rainfall patterns and intensity, reduction in species diversity, and ecosystem deterioration within the research locale. Various adaptation strategies for mitigating climate-related challenges were identified, including modifications to dietary compositions, implementation of adequately aerated housing structures, and ensuring continuous water availability. The study concluded by suggesting that poultry producers require comprehensive education regarding optimal management approaches to minimise the detrimental consequences of climatic variations in Nigeria.

Keywords: *Adaptation strategies, climatic variations, poultry farming, rainfall patterns.*

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Introduction

Climate change is a deviation in long-term climate patterns (Atehmengo et al., 2014). Global climate change is generally caused by greenhouse gas emissions such as carbonated oxides (CO₂), methane (CH₄), and nitrous oxides (N₂O), leading to atmospheric heating (IPCC, 2014).

Climate change is a threat to agriculture and socioeconomic development (Niang et al., 2014). It affects animal production through biodiversity

loss at a time when natural resources (particularly water), feed and feed volume and quality, heat loads, pests, and cattle demands are expected to be in the middle.

Projections indicate that the twenty-first century will witness a 100% escalation (Garnett, 2009). The primary concern involves achieving equilibrium among agricultural output, food security regarding nutrition, and ecological conservation (Wright et al., 2012). The African

continent faces the most severe consequences from anticipated climatic shifts, despite contributing minimally to greenhouse gas emissions (THGS) (Ngaira, 2007; Abioja and Abioma, 2020). Forecasts suggest temperature elevations ranging from 2-6 degrees Celsius, with Africa expected to experience increases of 1.5-3 degrees Celsius by mid-century (2050). These projected changes represent more extreme conditions compared to other geographical areas (Abioye and Abioma, 2020).

Within rural populations across numerous developing nations, particularly Nigeria, poultry farming fulfils crucial economic, dietary, social, and cultural functions. Poultry demonstrates remarkable efficiency in transforming feed resources into protein products such as eggs and meat within relatively brief production cycles. From a nutritional perspective, poultry products rank as the second most valuable source after dairy products (Kwabla, 2021; Mnisi et al., 2024).

Researchers and agricultural experts largely concur that expanding the Nigerian poultry industry offers the quickest solution to the nation's persistent protein shortage (Amos, 2006). Poultry farming contributes significantly to the livelihood of small-scale farmers, particularly women, by providing an additional source of income (Gueye, 2005). For many households, chicken meat and eggs not only serve as a source of nourishment but also act as a motivating factor for food security. Poultry products remain a preferred and affordable source of animal protein for a large segment of the population.

Beyond improving nutrition, poultry production also serves as a reliable source of cash income that can be reinvested at various life stages (Karbo and Bruce, 2000). Poultry farming continues to play a vital role in enhancing both protein availability and income generation. According to FAOSTAT (2023), poultry meat accounts for approximately 38% of the total global meat production, underscoring its nutritional and economic significance. However,

poultry production across Africa and other parts of the world is increasingly threatened by climate change, which has disrupted the supply and distribution of poultry products like meat and eggs (Abioja et al., 2020). In Nigeria, the escalating effects of climate variability have emerged as a major challenge for poultry farmers (Ahmad et al., 2022).

Climate change has its effect on poultry flocks; this is due to the thermal conditions that affects the bird physiological and behavioural activities (Ayo-Enwerem 2017). Performance and survivability of poultry birds is influenced by environmental conditions such as ambient temperature, relative humidity and light at a given time (Pragya, 2014). It is important to emphasise that chickens can only tolerate moderate environmental conditions. Recent irregularities in temperature and weather have resulted in significant mortality rates among poultry flocks (Apalowo et al., 2024; Youssef et al., 2024). Extreme weather patterns have also adversely affected bird growth, feed intake, feed conversion efficiency, and egg yield and quality, with fluctuating rainfall and heat stress being major contributing factors (Abdul Rahman, 2022; Zhang, 2023; Youssef et al., 2024).

Recent concerns suggest that the continuing global warming and climate change trends in Africa may have increasingly negative impacts on future poultry growth and the overall well-being of birds (Attia et al., 2017).

The importance of poultry to the economy cannot be overestimated, as it was popular with small owners who increased the economy. Soon, poultry will be an effective converter of egg and meat grains. Poultry eggs are second after milk. According to the consensus of agriculture and nutritionists, it is the fastest way to expand current protein deficiencies in many developing countries (Amos, 2006). This study was conducted to study the impact of climate change on poultry production in Etsako West.

Research Questions

- i. What are the socio-economic characteristics of the respondents in the study area?
- ii. What is the respondents' perception about climate change in the study area?
- iii. What are the information sources of climate change in the study area?
- iv. Are there control measures to manage the effects of climate change on poultry?

Research Objectives

- I. To describe the socio-economic characteristics of the respondents in the study area
- ii. To determine the perception of the respondents in the study area
- iii. To identify the information sources of climate change in the study area
- iv. To investigate control measures in the management of climate change on poultry in the study Area

Materials and Methods

Description of the Study Area and Its Climate

This research was conducted in Etsako West Local Government Area, located in Auchi, Edo State, Nigeria. Auchi, the administrative headquarters, lies approximately at a latitude of 7.0631°N and longitude 6.2765563°E of the prime meridian. The area covers about 946 square kilometres and, according to the 2006 national census, has a population of 197,609 people. Etsako West shares its western boundary with Akoko Edo Local Government Area (Igarra), its eastern and northern boundaries with Etsako Central Local Government Area (Fugar), and its northern and western borders with Etsako East Local Government Area. Major communities within the local government include Auchi, Jattu,

Agbede, South Ibie, Aviele, and the Anwain clan, which comprises Erowan, Idegun, Awain, and Ibihiobe.

Survey Procedure

The questionnaire was pilot-tested among a group of selected poultry farmers to verify that the questions were clear, unambiguous, and easily understood by potential respondents. A total of 120 structured questionnaires, developed in line with the study's objectives, were randomly distributed to selected poultry farmers and other key stakeholders.

Data Analysis

The data collected were analysed using a simple statistical technique for calculating frequencies and percentages.

Results and Discussion

Table 1 shows that 85% of the respondents were male, while 15% were female, indicating a clear gender disparity in poultry production within the study area. It also reveals that about 76.6% of the respondents were married, underscoring the importance of poultry farming in sustaining household livelihoods and meeting family obligations. Additionally, only around 12.5% of the poultry farmers had attained tertiary education, implying that the majority may have a limited educational background to effectively access and apply information related to climate change and adaptation strategies. Additionally, 65% of the respondents identified poultry farming as their main occupation. The analysis also shows that the majority of poultry enterprises (85.83%) were self-financed, while 65% of the farmers earned less than ₦100,000 annually from their poultry operations.

Table 1: Socio-Economic Distribution of Respondents

Variables	Frequencies	Percentages
Sex		
Male	102	85
Age		
<30	22	18.33
30-39	54	45.0
40-49	26	21.67
50-59	18	15.0
Marital status		
Single	28	23.33
Married	92	76.67
Level of education		
No formal education	19	15.83
Primary Education	70	58.33
Secondary Education	16	13.33
Tertiary	15	12.50
Primary occupation		
Poultry keeping	78	65.0
Trading	30	25.0
Artisan	12	10.0
Annual income		
<50,000	45	37.5
50,001-100,000	33	27.5
100,001-150,000	22	18.33
>150,000	20	16.67
Source of capital		
Self	103	85.83
Bank loan	3	2.50
Poultry association	10	8.33
Family and friends	4	3.33

Source: Field Survey, 2024

Climatic Variation

Table 2 reveals that climate variations are clearly noticeable and require no further confirmation. A significant proportion of poultry farmers recognised these changes, with 91.67% acknowledging increased temperatures, 20.83% reporting higher rainfall intensity, 86.67%

observing unusual poultry disease symptoms, and 96.67% noting irregular rainfall patterns. This indicates that climate variability is evident, primarily revolving around fluctuations in heat and rainfall levels. These findings align with the report by FAOSTAT (2023), which noted that the frequency of extreme weather events, such as

floods, has risen by approximately 10% over the past decade.

Table 2: Distribution of Climatic Variation

Variables	Yes frequency	Percentage	No frequency	Percentage
High temperature	110	91.67	10	8.33
Unfamiliar disease symptoms	104	86.67	16	13.33
Varying rainfall pattern	116	96.67	4	3.33
High rainfall intensity	85	70.83	35	29.17
Drier air	66	55.0	54	45
Prolonged dry season	64	53.33	56	46.67

Source: Field Survey, 2024

Information Sources

Table 3 indicates that information on how to effectively mitigate the impacts of climate variation is not adequately disseminated to poultry farmers. Most of the respondents indicated that they received such information mainly through radio programs and from relatives or friends. This aligns with Yahaya (2002) assertion that radio continues to serve as an

effective channel for disseminating agricultural information to farmers and their families. Nevertheless, many radio agricultural programs tend to concentrate more on crop production than on livestock-related matters. Furthermore, information received from family, friends, or even fellow poultry farmers may lack professional accuracy and is often based on trial-and-error experiences.

Table 3: Distribution of Information Sources

Variables	Yes frequency	Percentage	No frequency	Percentage
Radio	102	85.0	18	15.00
Television	44	36.67	76	63.33
Extension agent	12	10.00	108	90.00
Friend and family	103	85.83	17	14.17
Print	37	30.83	83	69.17
Internet	6	5.00	114	95.00
Other poultry farmers	108	90.00	12	10.00

Source: Field Survey, 2024

Measures for Controlling Effects of Climate Variation on Poultry Production

Table 4 shows that poultry farmers employ various adaptive strategies to reduce the impact of climate change, such as modifying feed formulations, utilising well-ventilated housing systems, increasing the space available per bird,

ensuring constant water supply, and enhancing hygiene standards. These practices align with the adaptation measures identified by Olanrewaju et al. (2010) as commonly used in poultry production to cope with climate-related challenges. Respondents also suggested that using concrete roofing materials could help reduce heat

accumulation in poultry houses. Although this option is relatively expensive, it is considered durable and effective. Additionally, increasing the space per bird helps minimise heat buildup, while

proper ventilation helps maintain stable humidity levels, thereby reducing the risk of pest infestations and disease outbreaks.

Table 4: Distribution of Respondents According to Measures for Controlling Effects of Climate Variation on Poultry Production

Variables	Yes frequency	Percentage	No frequency	Percentage
Change in feed formulation	95	79.17	25	20.83
Well-ventilated housing	108	90.00	12	10.00
Tree planting around pens	65	54.17	55	45.83
Chemotherapy	18	15.00	102	85.00
More space per bird	108	79.17	12	20.83
More water served	116	96.67	4	3.33
Better hygiene	109	90.83	11	9.17
Less heat supply	87	72.50	33	27.50

Source: Field Survey, 2024

Conclusion

In summary, poultry farmers in Etsako West Local Government Area of Edo State are currently experiencing the adverse effects of climate change. Many have noticed higher temperatures, inconsistent rainfall patterns, heavier rainfall, and the appearance of new or unfamiliar disease symptoms in their flocks. To address these challenges, farmers have implemented several adaptive measures, such as adjusting feed formulations to cut costs, supplying additional water to alleviate heat stress, building more spacious and well-ventilated poultry houses, planting trees around the pens, and improving hygiene standards in their farming operations.

Recommendations

Based on the above conclusion, the following recommendations are made:

1. Poultry farmers should be adequately educated through enhancement of extension service and

farmers support on best practices that can help mitigate the negative impacts of climate variability on poultry production.

2. Adequate measures should be taken to curb human activities that contribute to climate change and its resulting variations.
- 3.
4. Government should establish poultry insurance schemes to support farmers in case of uncertainty.
5. Government and relevant Non-Governmental Organisation should develop climate-resilience agricultural policies to assist poultry farmers mitigates the effect of climate change.
6. Government through the relevant agencies should conduct a climate vulnerability assessment regularly.

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