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Climate Change Adaptation Strategies by Poultry Farmers in Esan West Local Government Area, Edo State

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ABSTRACT

This study assessed climate change adaptation strategies by poultry farmers in Esan West Local Government Area, Edo State. The specific objectives were to determine the socio-economic characteristics of poultry farmers in the study area and determine the adaptation strategies adopted by the farmers in the study area. Primary data were collected from 50 respondents in Esan West LGA using multistage sampling techniques. Data were analyzed using descriptive and such as frequency, percentage mean and correlation. The findings from the study revealed that most (40%) of the respondents fall within the age range of 31-40years, most of the farmers have either primary school education (40%) or tertiary education (38%). Most of the farmers are married (60%). A significant proportion of the farmers (58%) have less than 100 birds. All the surveyed farmers (100%) have implemented an improved housing system as a strategy to adapt to climate change. While some farmers (40%) have adopted the use of shade nets and vaccines, most of them (60%) have not yet implemented these strategies. The findings indicate that there are significant correlations between certain socio-economic characteristics and the adoption of adaptation strategies. The study concluded that the poultry farmers implemented an improved housing system as a strategic in adapting to climate change. Therefore, the study recommends that addressing the high cost of adaptation strategies and limited financial issues should be prioritize by government and other relevant agencies by supporting poultry farmers to implement effective adaptation strategies and enhance their resilience to climate change impacts.

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INTRODUCTION

In Nigeria, climate change adaptation is crucial. Climate change is predicted to significantly impact agriculture in the nation, as it does in the rest of sub-Saharan Africa, as it works to fulfill the food consumption demands of its fast-expanding population (Mendelsohn and Massetti 2017). Because of climate change, global climate and agricultural production models predict reduced yields for staple crops in

West Africa (Sonneveld et al., 2012). The effects of climate change will be felt more keenly in arid and semi-arid regions, where more frequent droughts are predicted to decrease the amount of vegetation and livestock and raise the demand for already limited water supplies for animals (Debela et al., 2015; Ayanlade et al., 2017; Ou and Mendelsohn 2017). Climate estimates for Nigeria indicate that temperatures will climb by 1.1 to 2.5 °C by 2060 and that there will be 260 high heat days by 2100, up from 10 days in 1990 (USAID 2019). Additionally, research has shown that there is a greater degree of rainfall unpredictability, dry spells throughout the rainy seasons, and a greater degree of irregularity in the amount of precipitation once the rainy season begins (Ayanlade et al., 2017; Abatan et al., 2018).

Farmers who raise poultry and other livestock are already seeing the negative consequences of climate change. For instance, research has shown that livestock farmers and pastoralists in Africa have linked variations in temperature and rainfall patterns to a range of negative outcomes, including decreased animal productivity, higher animal mortality, smaller herd sizes, diminished water sources during the dry season, and the emergence of novel diseases in animals (Debela et al., 2015; Ayanlade et al., 2017). Increased heat and dry spells in the region can have a direct and indirect impact on poultry production, a topic that has not received much attention in the literature on climate adaptation in Africa. In intensive poultry farming systems, which are often prevalent in Africa and Asia, higher temperatures and heat stress have been related to losses in chicken production from death, low egg production (quantity and quality), and decreased development rate (Bhadauria et al., 2014). To control their internal temperature when under heat stress, hens limit their feed intake, which has an impact on their development and production (Nyoni et al., 2019).

Because of its impact on maize yields, climate change indirectly impacts the production of chickens and other animals. Reduced maize yields as a result of climate change have an impact on feed availability, pricing, and poultry enterprises' profitability. Maize is a major element in chicken feed. According to the IPCC (2007), adaptation refers to the changes made in response to present or anticipated climatic stimuli or their consequences that mitigate harm or take advantage of advantageous chances. The genetic variety of cattle and their ability to adjust to climate change indicates that adaptation techniques take into account not only the animals' heat tolerance but also their capacity to endure, procreate, and thrive in the face of disease, parasites, and inadequate nourishment (Hoffmann, 2008).

The poultry subsector in Nigeria is expanding and changing quickly. This is linked to how diets change as wages rise and cities become more populated (Liverpool-Tasie et al., 2017). Poultry plays a significant part in food security since it provides money and protein to many Nigerian families. There is not much information available about the impact of climate change on the Nigerian poultry subsector, despite its

significance for the nation's lives. Even less is known about how chicken farms are adjusting to the changing environment.

There is a paucity of literature on this impact in Edo state, Nigeria, despite a few studies having been done to evaluate the adaptation strategies of poultry farmers in various states of the country. Farmers will be able to combat the risks climate change poses to agricultural output if they are aware of the implications of climate change adaptation techniques. This study was planned to identify the adaption strategies used by the farmers in the Esan West Local Government Area, Edo State, in order to fill this gap. The goals were to: i) determine the socio-economic characteristics of poultry farmers in the study area and ii) determine the adaptation strategies adopted by the farmers in the study area.

The study will also test the hypothesis that there is no significant relationship between the socio-economic characteristics of poultry farmers and climate change adaptation strategies.

MATERIAL and METHOD

This study was carried out in Esan West Local Government Area of Edo State. Esan West is one of the 18 local government areas in Edo state with Ekpoma as her headquarters. It is made up of ten wards and twenty-one communities. The local government covers a land mass of about 502 Km square (NPC, 2006). The population of the different communities put together according to the 2006 provisional census was figured at 125,542.

The researcher used multistage sampling technique. The first stage was the purposive selection of Esan West Local Government, where the study was carried out. The second stage was the random selection of five (5) local communities in Esan West Local Government Area. The selected communities were Ile, Ukpenu, Ekpoma, Iruepken, and Uhiele. The third stage was the random selection of 10 farmers from each community, given that a total of 50 respondents were used for this study. Primary data were gathered through a questionnaire.

The research used descriptive measurement, which includes tables and summaries of the data in the form of means, frequencies, and standard deviations.

RESULTS AND DISCUSSION

Socio-economic Characteristics of Respondents

Table 1 below presents the socio-economic characteristics of the respondents in the study. Out of the total 50 respondents, 30 were male, constituting 60% of the sample, while 20 respondents were female, accounting for 40% of the sample. The table shows that most respondents were male, with males outnumbering females by a

significant margin. The findings agree with Farnworth et al. (2012) who reported in their study that men mostly engage themselves in agriculture compared to women.

Among the 50 respondents, 8 individuals fell within the age range of 18 to 30 years, constituting 16% of the total sample. The age group of 31 to 40 years had the highest frequency, with 20 respondents, representing 40% of the sample. Similarly, the age range of 41 to 50 years included 18 respondents, accounting for 36% of the sample. Lastly, 4 participants, or 8% of the sample, were aged between 51 and 60 years. The data in table 1 below support the findings. This indicates that middle aged individuals are highly involved in poultry production in the study area. This corroborates with the findings of Ayanlade et al. (2017) that middle-aged individuals are actively involved in poultry production.

Table 1. Socio-economic characteristics of respondents (n=50)

Gender	Frequency	%
Male	30	60.0
Female	20	40.0
Total	50	100.0
AGE		
18-30 years	8	16.0
31-40 years	20	40.0
41-50 years	18	36.0
51-60 years	4	8.0
Total	50	100.0
Educational Qualification		
No formal Education	9	18.0
Primary School	20	40.0
Secondary School	2	4.0
Tertiary Education	19	38.0
Total	50	100.0
Marital Status		
Single	10	20.0
Married	30	60.0
Divorced/Separated/Widowed	10	20.0
Total	50	100.0
Average Number Of Birds		
Less than 100	29	58.0
100-500	8	16.0
501-1000	5	10.0
Above 1000	8	16.0
Total	50	100.0

Source: field survey, 2024

Most farmers have either primary school education (40%) or tertiary education (38%). A smaller proportion of farmers have no formal education (18%) or secondary school education (4%). These findings highlight the importance of education in poultry

farming, as higher education levels can contribute to better farming practices, understanding of climate change adaptation strategies, and access to relevant information and technologies.

Most farmers are married, constituting 60% of the sample. A smaller proportion of farmers are either single (20%) or divorced/separated/widowed (20%). This finding suggests that married individuals are actively engaged in poultry farming, which may be influenced by the need to support their families and generate income.

Most farmers (58%) have less than 100 birds on average. A smaller proportion of farmers (16%) have an average of 100 to 500 birds, while another 16% have an average of more than 1000 birds. Additionally, 10% of farmers have an average of 501 to 1000 birds. The findings suggest that a significant number of poultry farmers in the study area operate small-scale poultry farms with relatively fewer birds. This could be influenced by factors such as available space, capital investment, and market demand. Farmers with larger flock sizes may have additional considerations and challenges in terms of management, infrastructure, and market access.

Adaptation Strategies by Respondents

The adaptive strategies of the poultry farmers are shown on Table 2 below. All the surveyed farmers (100%) have implemented an improved housing system as a strategy to adapt to climate change. This indicates a high level of awareness and recognition among farmers regarding the importance of providing suitable housing conditions for their poultry to mitigate the impacts of climate change. While 40% of farmers have adopted the use of shade nets and vaccines, 60% have not yet implemented these strategies. Similarly, 60% of farmers have made changes in their feeding regime, while the remaining 40% have not implemented such changes. The findings suggest that there is still room for improvement in the adoption of certain climate change adaptation strategies among poultry farmers in the study area. Promoting the benefits and effectiveness of shade nets, vaccines, and appropriate feeding regimes could encourage more farmers to implement these strategies and enhance their resilience to climate change impacts. This finding is in line with Ezihe, Ochima, and Iorlamen (2020) findings who reported the use of shade net, vaccines and appropriate feeding regime as a strategy to adapt to climate change in poultry production.

Table 2. Adaptation strategies

Variabel	Frequency	%
Improved housing system	50	100.0
Use of Shade nets	20	40.0
Change in feeding regime	30	60.0
Use of vaccines	20	40.0

Source: field survey, 2023

Effectiveness of the Adaptation Strategies

Effectiveness of the adaptation strategies adopted by the respondents is shown in Table 3 below. The mean ratings indicate the perceived effectiveness of the climate change adaptation strategies implemented by poultry farmers in the study area. According to the data in table 3, the improved housing system has a mean rating of 3.00, suggesting that farmers consider it an effective strategy to mitigate the impacts of climate change on poultry production. This indicates that farmers recognize the importance of providing suitable housing conditions for their poultry and believe it helps in adapting to climate change. On the other hand, the use of shade nets, change in feeding regime, and use of vaccines received lower mean ratings, ranging from 1.20 to 1.80. This suggests that poultry farmers perceive these strategies to be less effective in addressing the challenges posed by climate change in poultry production. The findings suggest that there may be a need to further explore and evaluate the effectiveness of the shade nets, feeding regime changes, and vaccination practices in the local context. This result supports Thornton (2019) who reported that farmers consider improved housing system effective in adoption to climate change in poultry production.

Table 3. Effectiveness of the adaptation strategies

Variable	Mean	Decision
Improved housing system	3.00	Effective
Use of Shade nets	1.20	Not effective
Change in feeding regime	1.40	Not effective
Use of vaccines	1.80	Not effective

Source: field survey, 2024

Challenges Associated with Climate Change Adaptation Strategies

According to the data in table 4 below, the high cost of adaptation strategies received a mean rating of 3.00, suggesting that farmers perceive this challenge to be a serious issue. Limited financial resources received a mean rating of 2.00, indicating that farmers also consider this challenge to be significant. On the other hand, limited knowledge on adaptation strategies, inadequate technical support, and limited access to extension services received lower mean ratings ranging from 1.00 to 1.60. This suggests that farmers perceive these challenges to be less serious or have a relatively lower impact on their ability to adapt to climate change. The findings suggest that addressing the high cost of adaptation strategies and limited financial resources should be prioritized in order to support poultry farmers in implementing effective climate change adaptation measures.

Table 4. Challenges Associated with Climate Change Adaptation Strategies

Variables	Mean	Decision
High cost of adaptation strategies	3.00	Serious
Limited knowledge on adaptation strategies	1.00	Not serious
Inadequate technical support	1.60	Not serious
Limited access to extension services	1.60	Not serious
Limited financial resources	2.00	Serious

Source: field survey, 2024

Correlation Analysis

Correlation analysis is shown in Table 5 below. The correlation analysis was performed to check for the probability levels for the socio-economic variables and some reported a level of 0.000, which is less than the significance threshold of 0.01. This indicates that Education, Marital Status, Experience, and Average Number of Birds are all "Significant" factors in influencing the adoption of climate change adaptation strategies among poultry farmers. Therefore, we reject the null hypothesis (H0) which assumes no significant relationship, while we accept the alternative hypothesis (HA) which assumes a significant relationship between socio-economic characteristics and the adoption of climate change adaptation strategies in the study area.

Table 5. Correlation Analysis

Independent Variables	Adaptation Strategies Adopted (Total)		Decision
	Correlation coefficient (r)	Prob. Level	
Gender	0.080	0.580	Not Significant
Age	-0.074	0.607	Not Significant
Education	-0.523**	0.000	Significant
Marital Status	-0.930**	0.000	Significant
Experience	-0.621**	0.000	Significant
Average No of birds	-0.686**	0.000	Significant

** Correlation is significant at the 0.01 level (2-tailed).

CONCLUSION

This study revealed significant correlations between socio-economic factors and the adoption of climate change adaptation strategies among poultry farmers in Esan West Local Government Area, Edo state. Education emerged as a key influencer, emphasizing the pivotal role of knowledge in fostering resilience. The findings underscore the need for targeted interventions considering the diverse characteristics of poultry farmers. To address these findings, it is crucial to implement educational programs tailored to poultry farmers, promoting climate-smart practices.

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