



POULTRY TECHNOLOGIES ADOPTION BY FARMERS IN THE NIGER DELTA AREA OF NIGERIA



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Abstract: Do extension workers recommend poultry technologies and are they adopted by farmers? The study engaged in the adoption of poultry-based recommended technologies by farmers in the Niger Delta area of Nigeria. It appraised adoption levels of nine items of poultry-based recommended technologies using the Sigma Method of adoption and inspected the adoption level of the selected Niger Delta States. The study population was ADP poultry practitioners in Akwa Ibom, Bayelsa, and the Delta States. The selection of farmers was done using a combination of a multistage sampling procedure and simple random sampling techniques to achieve a sample size of 90 farmers. A dichotomous designed questionnaire was used to get facts from respondents. Results obtained showed that recommended adopted poultry practices in Akwa Ibom states had the highest adoption mean score (4.68) followed by Delta (4.42) and Bayelsa (4.08). The three states were rated at a medium level of adoption having a pooled mean of 4.39. The study concluded that the adoption categories of the nine recommended technologies were high (0%), medium (55.6%), and low (44.5%) levels across the Niger Delta area, respectively. It was recommended that there should be an increase in adoptable best practices and that extension workers should conduct more training sessions for poultry farmers.

Keywords: Adoption, agriculture, farmers, poultry, technologies

Introduction

Poultry, whether at production or value chain, is a profitable business. However, more than livestock activities, extension workers are mostly involved in communicating crop production technological packages to farmers for adoption and advancement of agricultural outputs (Ovharhe, 2014; Ebewore *et al.*, 2015). Poultry technologies vary from locality to locality. Tsadik *et al.* (2015) categorize poultry farmers using modern technological packages into various categories with the aid of the adoption index. This was characterized by high, medium, low, and, non-adopters.

Currently, it is very few attempts that have been discovered in the archival documentation of the categorizations of poultry technologies concerning adoption. Ovharhe (2016) contributes to exiting knowledge on aquaculture technological adoption among the Niger Delta farmers. This gap has made it necessary to critic into the poultry technological practices as a result of adoption training by extension workers in the Niger Delta area. So far, what are the levels of technology adoption that poultry farmers have been exposed to in the Niger Delta area? In a bid to answer this question, this study was specifically designed to assess the rate of recommended technological adoption by poultry farmers and to categorize them into high, medium, and low levels of adoption, respectively.

Materials and Methods

The Niger Delta Area covers about 70,000 square kilometers and makes up 7.5% of Nigeria's landmass, with sandy coastal ridge barriers, brackish or saline mangroves, permanent and seasonal swamp forests as well as low land rain forest with the entire area characterized by a large number of rivers, rivulets, streams, canals, and creeks (NNPC, 2005). See Appendix 1 for map of the study area. The area is characterized by the production of cassava, yam, oil palm, plantain, potato, vegetables, fruit trees, and other arable crops. Livestock and aquaculture business also thrive well. The riverine soils are known for alluvial deposits, otherwise known as Fadama soils (Ovharhe, 2017).

The Poultry Farmers' documentation was collected from the Agricultural Development Programme (ADP) offices of the three states: Akwa Ibom, Delta, and Bayelsa. Registered poultry farmers were chosen from six Local Government

Areas (LGAs) resulting in 18 LGAs for the research. A total of 5 farmers were drawn from each of the LGA areas to give a total of 30 farmers per state (Table 1) and eventually resulted in a sample size of 90 which was utilized for the study.

Table 1: Distribution of sample size by stages of sampling

| S/N | State Selection | LGAs Selection | Farmers Selection 3 |
|--------------|-----------------|----------------|-----------------------|
| A | Akwa Ibom | 6 | 30 |
| B | Bayelsa | 6 | 30 |
| C | Delta | 6 | 30 |
| Total | 3 | 18 | 90 respondents |

Data collection and measurement of variables

A dichotomized structured questionnaire which comprised of yes and no was used to collect primary data from respondents. While secondary information was obtained from ADP offices in the concerned states.

Technology adoption

Information obtained from the questionnaire was measured using the adoption level techniques by Sigma Method as employed by Agbamu (2006). In summary, the Sigma Model is For instance, if 35% of farmers adopted poultry housing techniques, the adoption score is calculated by dividing the adoption score with one-half and subtracting it from the whole percentage (100). That is $100\% - 35/2 = 82.5$. Next, using the normal deviate Statistical Table, the value 82 in the vertical row under column 5 gives 0.935. Furthermore, a constant, 2, is added to this outcome and multiplied by the same constant to increase the magnitude of the value from the Statistical Table. The sigma score for the adoption of poultry housing techniques is $(0.935 + 2)2 = 5.87$. Note: the assigned weights in the Sigma model is in a reverse form of a 10-point scale, the actual adoption of poultry housing techniques score will be $10 - 5.87$ which is 4.13. Thus, there are tripartite categories of adoption levels in this study: *high* = $5.5 - 10$; *medium* = $4.1 - 5.4$ and $0.0 - 4.0$ = *low* level of adoption (Ovharhe, 2017).

Results and Discussion

Level of adoption of recommended agricultural technologies by farmers in selected Niger Delta States

The adoption rates of poultry techniques and selected production recommendations by farmers were assessed using a dichotomous scale of yes or no responses.

The findings in Table 2 revealed that the majority of poultry farmers across the Niger Delta Area adopted recommended poultry-based technologies at medium levels. The most notable of the poultry-based practices that have a medium

level of adoption were intensive management system techniques (5.29), provision of medication (5.17), mixed farming (4.54), and feed formulation (4.31). The findings on semi-intensive management system techniques with low adoption score (3.81) are similar to those of Okoedo-Okojie and Ovharhe (2012) that farmers had a low rate of adoption of disseminated livestock technologies by women in agriculture in Delta State.

Table 2: Respondents adoption level of poultry-recommended practices using Sigma Method of adoption scores (n=90)

| S/N | Poultry-based recommendations | Akwa Ibom (n=30) | | Bayelsa (n=30) | | Delta (n=30) | | Total No. of adopters | Pooled Adoption Score (n=90) | Adoption Level |
|---------------------|---|---------------------|----------------|---------------------|----------------|---------------------|----------------|-----------------------|------------------------------|----------------|
| | | No. & % of adopters | Adoption Score | No. & % of adopters | Adoption Score | No. & % of adopters | Adoption Score | | | |
| 1 | Intensive management techniques | 21 (70.0) | 5.23 | 20 (66.7) | 5.14 | 24 (80.0) | 5.49 | 65 (72.2) | 5.29 | Medium |
| 2 | Medication provision | 21 (70.0) | 5.23 | 18 (60.0) | 4.95 | 22(73.3) | 5.32 | 61 (67.8) | 5.17 | Medium |
| 3 | Mixed farming | 19 (63.3) | 5.04 | 9 (30.0) | 3.93 | 15 (50.0) | 4.65 | 43 (47.8) | 4.54 | Medium |
| 4 | Feed formulation techniques (mash) | 23 (76.7) | 5.40 | 9 (30.0) | 3.93 | 7 (23.3) | 3.61 | 39 (43.3) | 4.31 | Medium |
| 5 | Carcass storage techniques | 19 (63.3) | 5.04 | 5 (16.7) | 3.23 | 10 (33.3) | 4.06 | 34 (37.8) | 4.11 | Medium |
| 6 | Stocking density (5 – 8 birds/m ²) | 9 (30.0) | 3.93 | 7 (23.3) | 3.61 | 10 (33.3) | 4.06 | 26 (28.9) | 3.87 | Low |
| 7 | Housing construction techniques (East-West orientation) | 9 (30.0) | 3.93 | 7 (23.3) | 3.61 | 9 (30.0) | 3.93 | 25 (27.8) | 3.82 | Low |
| 8 | Semi-Intensive management system techniques | 9 (30.0) | 3.93 | 10 (33.3) | 4.06 | 6 (20.0) | 3.44 | 25 (27.8) | 3.81 | Low |
| 9 | Brooding techniques | 8 (26.7) | 3.78 | 5 (16.7) | 3.23 | 11 (36.7) | 4.19 | 24 (26.7) | 3.73 | Low |
| Pooled means | | | 4.68 | | 4.08 | | 4.42 | | | |

Overall Adoption Level **4.39**
 Figures in parentheses imply percentages

Also, of the 9-item poultry-based recommended practices as listed in Table 3, it was observed that the rate of technology adoption was medium (55.6%) and low (44.5%) levels. None recorded high levels of adoption attainment.

Table 3: Summary of adoption means for poultry farmers in selected Niger Delta States

| State | Adoption means | Adoption level | Rank |
|------------------|----------------|----------------|-----------------|
| Akwa Ibom | 4.68 | Medium | 1 st |
| Delta | 4.42 | Medium | 2 nd |
| Bayelsa | 4.08 | Medium | 3 rd |

Pooled mean = 4.39; Medium level of adoption

Adoption means for poultry farmers in selected Niger Delta States

Table 3 summarizes the mean results for recommended adopted poultry practices in designated states in the Niger Delta. This showed that Akwa Ibom states had the highest adoption mean score in poultry production (4.68) followed by Delta (4.42) and Bayelsa (4.08). The three states were rated at Medium level of adoption having a pooled mean of 4.39. Ovharhe (2016) in a similar study in the Niger Delta area asserted that fish farmers’ adoption of introduced technological packages was at a medium level.

Conclusion

There were no high levels of adoption of recommended poultry technologies; rather, there were medium levels of adoption in intensive management techniques, medication provision, mixed farming, feed formulation techniques, and carcass storage techniques. Low levels of adoption of recommended technologies were noticeable in stocking density, housing construction techniques, semi-intensive management system techniques, and brooding techniques

Recommendations

The study recommends that:

- i. An increase in adoptable best practices should be encouraged so that farmers at medium and low adoption levels will project into improved performances level.
- ii. Extension workers at various state levels should conduct more training sessions for poultry farmers to move from medium levels of adoption to higher adoption rates

Conflict of Interest

Authors have declared that there is no conflict of interest reported in this work.

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APPENDIX 1



1 = Abia, 2 = Akwa Ibom, 3 = Bayelsa, 4 = Cross River, 5 = Delta, 6 = Edo, 7 = Imo, 8 = Ondo, 9 = Rivers

Source: Federal Republic of Nigeria (2020)

Fig. 1: Map of Nigeria showing the Niger Delta States