

DIGITAL COMMUNICATION TOOLS UTILISATION BY POULTRY FARMERS IN OGUN STATE, NIGERIA

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ABSTRACT

Digital Communication Tools (DCTs) are increasingly transforming agricultural production by improving information flow, farm management and market access. This study assessed poultry farmers' utilisation of DCTs in Ogun State, Nigeria, highlighting their perception, extent of DCTs use and associated challenges. A two-stage sampling procedure was employed to select 120 respondents. Data were collected using a well-structured questionnaire and analysed using descriptive statistics (percentages, frequency counts and mean) and Pearson Product Moment Correlation. Respondents had a mean age of 43 ± 9.55 years, a household size of 6 ± 2.20 persons, and 11 ± 4.69 years of formal education. More than half (60.7%) of the respondents had favourable perceptions of DCTs use. The extent of DCTs use was low among 59.2% of respondents, while a majority (64.9%) experienced a high level of constraints in their use. The major constraints identified were high service costs ($\bar{x} = 1.58$), erratic power supply ($\bar{x} = 1.26$), high initial investment in digital tools ($\bar{x} = 1.24$) and limited internet access ($\bar{x} = 1.01$). Correlation analysis showed that age ($r = -0.284$) household size ($r = 0.011$) and years of education ($r = 0.052$) were significantly related to the extent of DCT utilisation for poultry production. Enhancing poultry farmers' utilisation of DCTs requires affordable services, reliable electricity, financing support and rural internet. Government and agricultural organisations should address these gaps through targeted interventions to reduce adoption constraints and strengthen digital tool use in poultry production.

Keywords: Digital communication tools, Poultry farmers, Adoption constraints, Agricultural innovation

INTRODUCTION

Nigeria, often referred to as the "Giant of Africa," boasts of a diverse and rich agricultural landscape (Jekayinfa *et al.*, 2020). Agriculture in Nigeria encompasses a wide range of activities, including crop cultivation, livestock rearing, fisheries and forestry, contributing significantly to employment, food security and economic growth. With a favourable climate, abundant natural resources and a large population dependent on agriculture for livelihood, the sector plays a pivotal role in the country's economy (Adamaagashi *et al.*, 2023). Among the various agricultural activities in Nigeria, poultry farming holds particular significance. The poultry industry is a vital sector in many economies, providing a source of protein for millions of people around the world and a significant contributor to food security and the economy in many countries (Birhanu *et al.*, 2022). Poultry farming involves the rearing of domesticated birds such as chickens, turkeys, ducks and geese for meat and egg production. The sector has witnessed substantial growth in recent decades, driven by increasing demand for poultry products, rising urbanisation and changing dietary preferences (FAO, 2022). Poultry farming not only provides a vital source of protein but also offers employment opportunities, especially for smallholder farmers and rural communities (Ajala, 2021 and FAO, 2022).

Despite its importance, poultry farming in Nigeria faces numerous challenges that hinder its full potential with one of the primary challenges being disease outbreaks, including avian influenza

(bird flu) and Newcastle disease, which can decimate poultry populations and disrupt production (Ekiri *et al.*, 2021). Additionally, inadequate infrastructure, such as poor road networks, electricity supply and storage facilities, pose logistical challenges for poultry farmers, particularly in remote and rural areas. Market access issues, including price volatility and limited market information, further exacerbate the challenges faced by poultry farmers in Nigeria (Anosike *et al.*, 2020).

Traditionally, poultry farming in Nigeria has been characterised by small-scale, backyard operations, often using rudimentary techniques and practices. While these traditional methods remain prevalent, there is a growing recognition of the need to modernise the poultry sector to improve productivity, efficiency and profitability (Otunaruke *et al.*, 2023). Modernisation efforts include the adoption of improved breeds, better management practices and the use of technology and innovation to address existing challenges and enhance competitiveness (George and George, 2023).

The role of technology in agriculture has become increasingly prominent in recent years, both globally and within Nigeria. Digital Communication Tools are pivotal in revolutionising agricultural practices, offering unprecedented opportunities for communication, market access and productivity enhancements (Umar, 2022). Digital Communication Tools refer to a variety of digital technologies and platforms utilised for communication, collaboration and information exchange.

These tools encompass a wide range of applications, including but not limited to social media platforms, mobile applications, websites and digital management software. In the context of agriculture, these tools enable farmers to access real-time information on market prices, weather forecasts, pest and disease management and best agricultural practices. Additionally, digital platforms facilitate communication and collaboration among stakeholders across the agricultural value chain, from input suppliers and farmers to traders and consumers (Rajkhowa and Qaim, 2021). Digital technologies via ICTs offer numerous opportunities for farmers, investors and entrepreneurs to enhance the efficiency of production and marketing of agricultural products. This approach aligns with the innovation system thinking as described by Akinwale *et al.*, (2023).

In the Nigerian context, where access to traditional agricultural extension services is limited, technology-mediated solutions have the potential to bridge information gaps, facilitate market linkages and empower farmers with knowledge and resources (Umar, 2022). While DCTs hold immense potential for driving innovation in poultry farming, there is limited literature available on farmers' consideration of DCTs in poultry farming in Nigeria, particularly regarding their adoption and effective utilisation in Nigeria (Olanrewaju *et al.*, 2021). Furthermore, there is a gap in knowledge on how Nigerian poultry farmers perceive, access, and utilise DCTs to innovate within their farming practices. It is in this context that the following objectives guided this study:

The specific objectives were to:

1. assessed DCTs' utilisation by poultry farmers in the study area;
2. determined respondents' perception of the use of DCTs in the study area;
3. determined the extent of DCTs use;
4. identified the constraints faced by respondents in the use of DCTs.

The study further hypothesised the significant relationship between respondents' socioeconomic characteristics and their utilisation of DCTs for poultry production.

METHODOLOGY

Ogun State, located in southwestern Nigeria (latitude 6.9980° N, longitude 3.4737° E), The state covers about 16,762 square kilometers which is approximately 1.81 percent of Nigeria's landmass of about 923,768 and a projected population of 5.2 million by the year 2020 (NPC, 2006). Agriculture forms the backbone of Ogun State's economy, with crops like cocoa, cassava and maize dominating its agricultural landscape. Poultry farming also holds significant importance, with numerous farms dotting the rural and peri-urban areas. Poultry farming is a

prominent agricultural sub-sector in Ogun State, contributing significantly to the state's economy and providing livelihoods for numerous rural households (Osinowo and Tolorunju, 2019).

A multistage sampling procedure was adopted for this study. At the first stage, twenty percent (20%) of the Local Government Areas (LGAs) in Ogun State, representing six LGAs, were randomly selected. In the second stage, one community was randomly chosen from each of the selected LGAs, resulting in a total of six communities. At the third stage, a sampling frame of poultry farmers in each community was compiled using records obtained from local agricultural extension officers and farmers' associations. From these lists, twenty-five (25) poultry farmers were randomly selected from each community, giving a total of one hundred and fifty (150) respondents for the study. Primary data were obtained with the aid of structured questionnaire that captured variables like farmers' socioeconomic characteristics, perception of DCTs use, extent of DCTs use and constraints to the use of DCTs. Percentage, standard deviation, the mean Chi-square and the Pearson Product Moment Correlation were used to analyse the data. Respondents' perception of DCTs usage was assessed through a scale comprising 13 statements. A five-point Likert-type scale was employed, with response options ranging from "strongly agree" to "strongly disagree," including a neutral category. The scoring was as follows: 5 = "strongly agree," 4 = "agree," 3 = "neutral," 2 = "disagree," and 1 = "strongly disagree" for positive statements, while negative statements were reverse scored. An index of perception regarding DCTs usage was calculated by summing all the responses. The respondents were classified based on the mean as having either a favourable or unfavourable perception, using a threshold of above and below the mean (56.31 ± 5.22).

Fourteen DCTs were listed to gauge the extent of respondents' use. Response options included "to a Large extent", "to a Lesser extent" and "rarely" with assigned scores of 3, 2 and 1, respectively. Additionally, an index of the extent of use was calculated, facilitating the categorisation of respondents into low and high usage groups based on a criterion of below and above the mean (14.16 ± 5.42).

Ten potential challenges encountered in the use of DCTs were assessed, with response options categorised as "severe" (2), "Mild" (1), and "Not a Constraint" (0). The mean score was calculated to prioritise these challenges based on severity. An index of constraints to DCTs use was then derived to classify respondents into low and high usage categories using a criterion above and below the mean (7.94 ± 3.31). Percentage, standard deviation, the mean Chi-square and the Pearson Product

Moment Correlation were used to analyse the data at a significance level of $\alpha = 0.05$.

RESULTS AND DISCUSSION

Farmers’ perception of Digital Communication Tools (DCTs) for poultry production

The results indicate a very strong positive perception of key DCTs among poultry farmers. A large majority of respondents agreed that Facebook serves as a cost-effective platform for advertising poultry products, with 91.9% expressing agreement. Similarly, 98.8% of farmers agreed that YouTube facilitates faster dissemination of agricultural and extension information, highlighting its effectiveness as a timely information-sharing medium.

Respondents also expressed high confidence in Facebook’s ability to improve access to customers

and suppliers, with 95.4% agreeing to its usefulness. In addition, 98.8% of farmers agreed that WhatsApp enhances poultry product sales, reflecting its value as a tool for marketing, customer engagement, and real-time communication. This aligns with the findings of Hafiar and Lukman (2018), who noted that WhatsApp groups are highly effective and interactive for promotional activities while being cost-efficient.

Overall, these findings demonstrate that social media platforms, particularly Facebook, YouTube and WhatsApp, are widely perceived as valuable and efficient tools for communication, information access and market-related activities within poultry production.

Table 1. Poultry farmers’ perception of DCTs use for Poultry Production

| Perception statements | SA (%) | A (%) | U (%) | S D (%) | D (%) |
|--|----------------|-------|-------|---------|-------|
| Advertisement costs are cheap with Facebook usage | 82.0 | 9.9 | 8.1 | 0.0 | 0.0 |
| Communicating agriculture and extension information spreads faster using YouTube | 68.0 | 30.8 | 1.2 | 0.0 | 0.0 |
| Facebook use makes it easy to reach customers and suppliers | 73.3 | 22.1 | 4.7 | 0.0 | 0.0 |
| WhatsApp usage enhances increased poultry product sales | 70.5 | 28.3 | 1.2 | 0.0 | 0.0 |
| Skype can be a useful source of agricultural information | 72.7 | 25..2 | 1.7 | 0.0 | 0.0 |
| Digital marketing has a bigger population reach with Instagram usage | 94.2 | 5.8 | 0.0 | 0.0 | 0.0 |
| Security cameras are simple to operate | 43.0 | 28.3 | 0.0 | 28.7 | 0.0 |
| The cost of maintaining Data Analytical Platforms is cheap | 77.7 | 18.2 | 2.5 | 0.0 | 1.6 |
| Poultry management software has the potential to identify and find solutions to some of the numerous problems faced in poultry farming | 88.4 | 11.6 | 0.0 | 0.0 | 3.1 |
| It is easy to receive feedback from customers through WhatsApp | 89.7 | 0.0 | 0.0 | 0.0 | 10.3 |
| Websites and blogs is a marketing communication channels for the poultry business | 24.6 | 40.9 | 10.1 | 9.7 | 14.7 |
| Instagram use makes it easy to share information with customers/ suppliers/similar businesses | 76.9 | 15.1 | 7.9 | 0.0 | 77.5 |
| Perception category | Percent | | | | |
| Favourable | 60.3 | | | | |
| Unfavourable | 39.7 | | | | |

Source: Field survey, 2023

Extent of DCTs use for poultry production

Table 2 reveals that farmers to a large extent used Facebook ($\bar{x}=2.76$), WhatsApp ($\bar{x}=2.73$), Zoom ($\bar{x}=1.19$), YouTube ($\bar{x}=1.14$), Instagram ($\bar{x}=0.88$), websites and blogs ($\bar{x}=0.85$), as well as Skype ($\bar{x}=0.79$) for sourcing information on poultry production. This implies that the most used DCTs by the farmers are Facebook and WhatsApp, Zoom, YouTube, Instagram, websites and blogs, as well as Skype. Indicating DCTs prevalence while, the high ranking of Facebook and WhatsApp implies these platforms are crucial for effective, cost-efficient communication and marketing. Their affordability

helps reduce operational expenses, enabling even small-scale farmers to compete. Mhina *et.al.*, (2023) in a similar study also reported that Facebook and WhatsApp were the major social media tools used to access general information on chicken management, chickens’ diseases and control and housing for improving chicken farming activities.

Table 2 further reveals that respondents had low (70.2%) level of use of DCTs for poultry production. This suggests that a significant portion of poultry farmers exhibit limited engagement with digital technologies for technological advancement or innovation in agricultural practices. This could be as a result of some constraints encountered.

Table 2. Distribution of Respondents by the Use of DCTs for poultry production

| Type of DCTs | Mean±SD |
|-----------------------------|-------------------|
| Facebook | 2.76 ± 0.7 |
| WhatsApp | 2.73 ± 0.7 |
| Zoom | 1.19 ± 2.0 |
| YouTube | 1.14 ± 1.5 |
| Instagram | 0.88 ± 1.2 |
| Websites and blogs | 0.85 ± 1.2 |
| Skype | 0.79 ± 1.2 |
| Weather App & alert | 0.68 ± 1.0 |
| Poultry management software | 0.53 ± 1.4 |
| Sensors | 0.25 ± 1.3 |
| Data Analytic Platforms | 0.08 ± 0.5 |
| Level of DCTs usage | Percentage |
| Low | 59.1 |
| High | 40.9 |

Source: Field survey, 2023

Constraints faced by poultry farmers in the use of DCTs

The respondents reported several constraints that affect the use of DCTs for agricultural innovation. The high cost of services emerged as the most prominent barrier, reflecting the significant financial burden associated with accessing and utilising these tools. Inconsistent power supply was also frequently cited as a major challenge, indicating that erratic electricity can disrupt effective use of DCTs in poultry production. The cost of acquiring digital devices further limits adoption, as the initial investment required to purchase the necessary equipment can be prohibitive for smallholder farmers. Poor internet reception was another common constraint, highlighting the importance of reliable connectivity for the effective use of DCTs.

In addition, a lack of awareness about the roles and potential benefits of these tools reduces their utilisation.

These findings are consistent with previous studies. Ayandiji *et al.* (2021) reported that poor internet connection, slow network speed, and high data costs were major obstacles to social media use among farmers in Oyo State. Similarly, Falola *et al.* (2022) highlighted that high internet subscription fees imposed by network providers significantly limit poultry farmers’ ability to use social media effectively for agricultural purposes. Collectively, these challenges underscore the need for interventions aimed at improving infrastructure, reducing costs, and increasing awareness to enhance the adoption and effective use of DCTs in agriculture.

Table 3. Constraints faced by poultry farmers in the use of DCTs

| Constraints | Mean Score/SD |
|---------------------------------------|-------------------|
| High cost of services | 1.62 ± 0.6 |
| Erratic power supply | 1.54 ± 0.8 |
| High cost of DCTs device | 1.36 ± 0.8 |
| Poor internet reception | 1.16 ± 0.7 |
| lack of awareness of DCT roles | 0.82 ± 0.5 |
| Lack of technical know how | 0.77 ± 0.8 |
| Illiteracy | 0.21 ± 0.4 |
| Level of Constraint to DCT use | Percentage |
| Low | 40.3 |
| High | 59.7 |

Source: Field survey, 2023

Test of relationships between selected socioeconomic characteristics and DCTs use for poultry production

Table 4 shows that respondents’ age ($r = -0.284$), stock size ($r = 0.171$; $p < 0.05$), household size ($r = 0.011$; $p < 0.05$) and years of education ($r =$

0.052 ; $p < 0.05$) significant to the use of DCTs for poultry production.

First off, age result implies that as farmers’ age increases, their use of DCTs gradually decreases. However, farmers with larger stock sizes, much household sizes with more years of education are more likely to utilise DCTs in their agricultural

practices. The result is similar to the reports of Foltise *et al.* (2018) and Ifeanyi-obi *et al.* (2023), which reported that age, number of birds and educational status affect both poultry farmers' use of mobile phones as well as extension agents' utilisation of DCTs.

However, variables such as sex, marital status, income and years of experience did not show significant associations with DCTs use, implying that these factors do not influence the adoption of DCTs for agriculture.

Table 15. Relationship between some selected socioeconomic characteristics and level of DCTs use for Poultry Production

| Variable | χ^2 value | df | r- value |
|---------------------------|---------------------|----|----------|
| Sex | 0.612 ^a | 1 | |
| Marital status | 24.558 ^a | 3 | |
| Age | | | -0.284** |
| Years of formal education | | | 0.052** |
| Household size | | | 0.011** |
| Income | | | -0.65 |
| Years of experience | | | -0.067 |
| Stock size | | | 0.171** |

p ≤ 0.05 = significant. **Source: Field survey, 2023

CONCLUSION AND RECOMMENDATIONS

This study concludes that although poultry farmers generally have a favourable perception of DCTs, their effective use is limited by poor electricity supply, weak internet connectivity and the high cost of devices and services. Socioeconomic factors such as age, marital status and household size also influence how farmers engage with these tools, highlighting the need for supportive interventions that address both infrastructural and user-related factors.

To address these gaps, government agencies should improve access to reliable electricity and internet services in poultry-producing areas. Extension agencies should organise digital literacy training to strengthen farmers' capacity to use DCTs effectively. Government bodies and development partners should consider subsidies or grants to reduce the initial cost of acquiring digital tools, while telecommunication providers should work toward more affordable and accessible data services. Extension workers and farmer groups should also conduct awareness campaigns to promote the benefits of DCTs and strategies for overcoming existing constraints.

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