

*Original Research Article***Analysis of poultry farmers' information needs in Adamawa State, Nigeria**Amurtiya **Michael**\*<sup>1</sup>, Mark **Polycarp**<sup>1</sup>, Hyelda John **Abakura**<sup>2</sup>, Jemimah Joseph **Yidau**<sup>1</sup><sup>1</sup>Department of Agricultural Economics and Extension, Modibbo Adama University of Technology Yola, Nigeria<sup>2</sup>Department of Animal Science and Range Management, Modibbo Adama University of Technology Yola, Nigeria**Correspondence to:****A. Michael**, Department of Agricultural Economics and Extension, Modibbo Adama University of Technology Yola, Nigeria; e-mail: michaelamurtiya@yahoo.com, michael.amurtiya@mautech.edu.ng**Abstract**

Information is a critical factor in the farming business as the survival of the participants relies on their ability to access innovations and meet the dynamic challenges of the sector. This study analysed the information needs of poultry farmers in Adamawa State, Nigeria. The study adopted a descriptive survey research design, and a multistage sampling technique to collect data (from 113 poultry farmers) for the study. Descriptive statistics, a three-point rating scale, and the Ordinary Least Square regression model were used to analyse the data collected. The findings of the study indicated that the prominent information sources among the farmers were: the internet, acquaintances/friends, and radio. Similarly, the study revealed that the respondents require information on various aspects of poultry production. Based on the results, age, household size, educational level, and membership in association negatively influence poultry farmers' information needs, whereas gender, farm size, and farming experience have shown a positive influence on the farmers' information needs. Hence, the study emphasised the need for the government and other actors in the agricultural sector to employ and also motivate agricultural extension workers to widen the scope of their reach using the internet.

**Keywords:** agriculture; extension service; livestock farming; Information and Communication Technology (ICT); social network.

**INTRODUCTION**

Nigeria's poultry sub-sector is emerging to become the fastest and most commercialised aspect of the livestock industry in the country (Adene and Oguntade, 2006; Adedeji et al., 2014). The country has a poultry population of about 180 million birds that produce about 300,000 and 650,000 tonnes of eggs as of December 2014, respectively (SAHEL, 2015; FAOSTAT, 2018). This could be attributed to the nation's exploding human population and also the growth in income of people in recent years which has led to increased demand for various poultry products. Another reason for the popularity of the sector is the fact that the birds have high ability of feed conversion into useful products

like meat and egg. In terms of cost, the initial outlay for poultry production is relatively low when compared to other livestock ventures, and the return on investment is appreciable (Heise et al., 2015; Yusuf et al., 2016; FAO, 2018). Due to these advantages, a large proportion of rural families in Nigeria are into poultry production as an investment and source of food (meat and eggs) manure at home or for use during festivals (Okoli et al., 2004; Yitbarek et al., 2016). Hence, the sector can also substantially supplement incomes from other livelihood sources leading to sustainable livelihood for farming households (Ogunlade et al., 2017).

Despite the great benefits the nation can generate for its people and the economy from the poultry sector,

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there is still a huge deficit in the production of poultry products, which has led to a very high trade imbalance between this and other countries. According to the Guardian Newspaper (2017), as of December 2016, the nation can only produce 30% of its poultry demands. Due to this inadequacy, the country imports a very large proportion of its poultry-related demands. This deficit can be attributed to a large number of small-scale farmers who mostly adopt a traditional farming system in production. Often, these farming systems are characterised by outdated equipment and production techniques, non-standard breeds or mixed strains, weak feed industry, poor management practices, and poor market access due to inadequate infrastructure (Ameji et al., 2012; Tikwe et al., 2016; Eze et al., 2017).

Improved access to production information is central to agricultural development since it is now a significant factor in production (Malhaam, 2011). According to Oladeji (2011), enhancing poultry farmers' access to information through effective communication can go a long way in unleashing the potential of the sector in Nigeria (Food and Agriculture Organisation, 2002; Meyer, 2005; Curtis, 2013). According to Moreki and Keaikitse (2013), across most developing nations, the coverage of agricultural extension institutions has been grossly inadequate, thereby affecting farmers' ability to access agricultural innovations. Considering the prominence of the poultry sector, there is the need to ensure that information reaching farmers from the limited outlets available to them is in consonance with the needs of the farmers and can substantially contribute to enhancing their performance. This will promote the effective management of the enterprise.

The inability of farmers to access information varies with locations in Nigeria. Adamawa State has a very high potential of becoming a leading producer of poultry products in the Northeast region with over 8.3 million poultry birds (Adene and Oguntade, 2006; Jongur et al., 2009; FAO and ICRISAT, 2019). The State's climatic condition, location, population, and socio-economic status of the people when properly exploited can increase the fortunes of the state in the venture. However, there is a paucity of literature on the various information needs of the poultry farmers and how best such information can be passed to them (Raheem and Ayanda, 2011). Having a clear understanding of the information needs and the widely patronised or accessible information dissemination channels will promote effective utilisation of agricultural extension resources in the state, and in turn, enhance the performance of poultry farmers in the state. Consequently, this study sought to describe poultry

farmers' socio-economic characteristics, identify information sources, determine information needs, and also identify factors influencing the poultry farmers' information needs.

## MATERIALS AND METHODS

### Study area

The study location is the Adamawa State, situated in the North-Eastern part of Nigeria. The area lies between Latitude 7° and 11°N and between Longitude 11° and 14°E. In terms of landmass, the area is about 38,700 km<sup>2</sup> and has a population of more than four million people (Adamawa State Government, 2016). The State has a tropical climate that is characterised by high temperatures and humidity as well as marked wet and dry seasons. The mean annual rainfall in the state ranges between 197 mm and 700 mm along in the Southern and North-Western parts of the state. The soil in the area is classified as ferruginous tropical soils with marked differences in horizons with an abundance of free oxides usually deposited as yellow or red concretion. Economically, the majority (over 80% of the residents of the state as of December 2018) undertake agriculture-related activities, particularly the cultivation of crops and raising animals (FAO and ICRISAT, 2019).

### Sampling techniques and data collection

In selecting respondents for the study, a multistage sampling technique was adopted so as to access a reasonable proportion of participants in poultry farming. Adamawa State has three senatorial zones, and to ensure wider geographical spread, all the three senatorial zones were purposively selected. In the second stage, four prominent towns notable for commercial poultry production were purposively selected. The towns selected were Yola-North, Yola-South, Mub-North, and Numan. Poultry farmers across the entirety of Adamawa State were the targeted population of the study. The relatively lower number of commercial poultry farmers has made it relatively difficult to access a reasonable percentage of the farmers; therefore the study adopted a snowball sampling technique. Poultry farmers were selected through referrals from various actors in the poultry value chains, particularly poultry product marketers and consumers. The data were collected for about eight weeks, and 113 poultry farmers that produce broilers, layers or both were used for the study. The instrument for data collection was a semi-structured questionnaire that covered various aspects of poultry farming.

The instrument was prepared to collect data using both paper and computer-assisted devices (CAPI) depending on the location and convenience. Furthermore, the instrument was pre-tested and validated before it was deployed for the study. In each of the study sites, the agricultural extension department provided a list of agents who served as key informants in identifying the poultry farmers. Similarly, key actors in the poultry value chain were identified and they also assisted in locating the poultry farmers in the area.

The study also involved the services of some trained research assistants who assisted in administering the questionnaire and conducting interviews in a situation where the respondent may not be ICT compliant to participate in the online data collection process.

**Methods of data analysis**

Descriptive and inferential statistics were used in the analysis of data collected for the study. Frequency distribution, means, and percentages were used to describe the respondents’ socio-economic characteristics. In identifying the information sources and also determining the information needs of the respondents, the study adopted the use of a three-point rating scale. For the respondents’ information sources, all the known sources were listed and their level of usage was scaled from ‘frequently’ (1) to ‘not at all’ (3). In terms of the respondents’ information needs, various aspects of poultry management were listed, and respondents’ level of information access was rated from ‘high’ (3) to ‘low’ (1). The decision rule of the three-point rating-scale is based on the assigned weight, and a mean score of ≥ 2.00 indicates acceptance, whereas a mean score of < 2.00 indicated rejection of the statement. The formula of the three-point rating-scale model is shown as follows:

$$\bar{x} = \frac{\sum F}{Nr} \tag{1}$$

where:

$\bar{x}$  = Mean Score

$\Sigma$  = Summation

F = Frequency of the Respondents

Nr = Number of respondents to the item

Similarly, ordinary least square (OLS) regression was used to assess the factors affecting the information needs of the respondents. The OLS model is specified as:

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \dots + \beta_9X_9 + U \tag{2}$$

where:

Y = Information need (mean score),  $\beta$  = parameter estimated, U = error term and X = independent variables.

X<sub>1</sub> = Age

X<sub>2</sub> = Gender

X<sub>3</sub> = Marital Status

X<sub>4</sub> = Household Size

X<sub>5</sub> = Educational Level

X<sub>6</sub> = Farm Size

X<sub>7</sub> = Farming Experience

X<sub>8</sub> = Access to Credit

X<sub>9</sub> = Membership of Association

The variables were selected based on previous studies related to information needs of farmers across Nigeria. The variables were selected following several submissions (Ameji et al., 2012; Hassan et al., 2012; Ajewole and Akinwumi, 2014; Ogunlade et al., 2017) on the subject. The details of the variables used are specified in Table 1.

**Table 1.** The independent variables used in the model

Variables	Explanation	Units	A priori expectation
X <sub>1</sub>	Age	Years	-
X <sub>2</sub>	Gender	Male = 1, Female = 0	+
X <sub>3</sub>	Marital status	Married = 1, Unmarried = 0	-
X <sub>4</sub>	Household size	Number of persons in the household	-
X <sub>5</sub>	Educational level	Number of years spent in school	-
X <sub>6</sub>	Farm size	Number of birds in the farm	+
X <sub>7</sub>	Farming experience	Years of poultry farming	-
X <sub>8</sub>	Access to credit	Yes = 1, No = 0	-
X <sub>9</sub>	Membership of association	Yes = 1, No = 0	-

**Table 2.** Description of the socio-economic characteristics of the respondents

Ordinal Variable	Parameters			
	Minimum	Maximum	Mean	Std. Deviation
Age (years)	23	55	33.81	8.76
Household size	3	16	7.07	3.29
Farm size (birds)	2	5555	1196.84	1422.69
Farming experience	0	21	4.41	4.16
Nominal Variable	Frequency	Percentage		
<b>Gender</b>				
Female	17	15.0		
Male	96	85.0		
<b>Marital status</b>				
Married	65	57.5		
Single	40	42.5		
<b>Level of education</b>				
No formal education	1	0.9		
Primary	6	5.3		
Secondary school	18	15.9		
Tertiary level	88	77.9		

Source: Field Survey, 2020

## RESULTS AND DISCUSSION

### Socio-economic characteristics of the respondents

Farmers' socio-economic characteristics play a great role in their ability to access and utilise information. Table 2 presents the description of some socio-economic characteristics of the respondents measured on an ordinal scale. Based on the results, the average age of the respondents was about 34 years, which implies that the majority are relatively young and are within their economically active age. The mean household size in the area was about 7 persons which implies that family labour can be provided for the farms. Similarly, the average number of birds (for broilers, layers or both) on the farm was 1119 with a mean poultry farming

experience of 4 years, which suggests that most of the farms are relatively large with reasonable experience. In the same vein, the distribution of some socio-economic variables measured on a nominal scale is presented in Table 2. The results indicated that most (85%) of the respondents were male, while the female farmers constituted 15%. This suggests that poultry production in the study area is dominated by the male gender due to some socio-cultural factors that limit females' access to economic resources compared to their male counterparts. Furthermore, regarding the marital status, 57.5% were married, and 42.5% were unmarried. Most (99.01%) of the farmers were educated. This finding implies that they can ease the challenge of accessing relevant agricultural information required to maximise gains from their farms.

**Table 3.** Respondents' sources of information

Information	Mean (X)	Ranking	Standard Deviation
Family members	1.94	6 <sup>th</sup>	0.78
Acquaintances/friends	2.45	2 <sup>nd</sup>	0.55
Traditional leaders	1.57	9 <sup>th</sup>	0.71
Libraries	1.85	7 <sup>th</sup>	0.63
Extension agents	1.30	10 <sup>th</sup>	0.86
Internet	2.57	1 <sup>st</sup>	0.58
Radio	2.26	3 <sup>rd</sup>	0.70
Television	2.19	4 <sup>th</sup>	0.64
Magazines and newspapers	2.13	5 <sup>th</sup>	0.73
Religious bodies	1.79	8 <sup>th</sup>	0.74

Source: Field survey, 2020

**Table 4.** Distribution of the respondents' information needs

Information	Mean (X)	Ranking	Standard Deviation
Site selection for housing	2.50	2 <sup>nd</sup>	0.50
Material to use in constructing the roof and floor	2.49	5 <sup>th</sup>	0.50
Batch intervals between sets of birds	2.40	9 <sup>th</sup>	0.67
Brooding and light management	2.39	10 <sup>th</sup>	0.47
Biosecurity/litter management	2.50	2 <sup>nd</sup>	0.59
Watering/types of drinkers	2.49	5 <sup>th</sup>	0.50
Local sources of feed	2.50	2 <sup>nd</sup>	0.59
Types of feed	2.39	10 <sup>th</sup>	0.67
Formulation of balanced feed	2.67	1 <sup>st</sup>	0.67
Diet supplement	2.41	7 <sup>th</sup>	0.68
Identification/removal of unproductive birds (culling)	2.12	15 <sup>th</sup>	0.56
Processing of meat	2.34	14 <sup>th</sup>	0.66
Grading and storage of eggs	2.29		0.65
Keeping records and accounts	2.41	7 <sup>th</sup>	0.75
Insurance of the farm	2.39	10 <sup>th</sup>	0.67
Sourcing of formal credit for the farm	2.35	13 <sup>th</sup>	0.74
Securing the farm from rodents, predators, and theft	2.12	15 <sup>th</sup>	0.66

Source: Field survey, 2020

**Information sources**

The distribution of the respondents' sources of information is presented in Table 3. The result was based on the mean score of two (2) which implied agreement with the statements on the information source, a mean score below two (2) suggests disagreement with the statement on the subject. The finding of the study showed that the internet had the highest ( $\bar{x} = 2.57$ ) patronage among the respondents. In the same vein, a large percentage of the respondents relied on acquaintances/friends ( $\bar{x} = 2.45$ ), to access agricultural information. Equally, electronic and print media, particularly the radio ( $\bar{x} = 2.26$ ), television ( $\bar{x} = 2.19$ ), and magazines/newspapers ( $\bar{x} = 2.13$ ) were also used by a reasonable percentage of the respondents to source poultry farming information. This finding agrees with the views of Ameji et al. (2012) and Folitse et al. (2018) who revealed that the major sources of information for the poultry farmers were family and friends, the Internet, and television. This result suggests the prominence of social capital and the internet in disseminating agricultural information. As opined by Opata et al. (2011), the ICT use by farmers can positively influence the productivity of agricultural enterprises. Another striking finding of the study is that most of the respondents do not rely on agricultural extension agents to source information. This has an implication on the quality of information being transmitted since the bulk

of channels has no direct access to the farm to physically understand the context. This conclusion lends credence to the submission of Oladeji (2011) who also revealed that there is a gross inadequacy of agricultural extension agents across most parts of Nigeria which may encourage farmers to rely on non-agricultural experts for information regarding farming activities. Similarly, the prominence of acquaintances/friends as a source of information for the farmers aligns with the submission of Hassan et al. (2012) who revealed that interpersonal sources are common agricultural information sources for farmers in Nigeria. But, farmers access agricultural information from various sources depending on their socio-economic status and location (Case, 2007; Curtis, 2013).

**Information needs**

The information needs of the farmers were assessed using the three-point Likert scale and the findings are presented in Table 4. A mean score of 2 or higher indicated agreement with the assertions, whereas a mean score of less than 2 indicated disagreement with the statements. Based on this result, the respondents require information on site selection for housing, type of materials to use in housing construction, batch intervals between sets of birds, brooding/light, and also biosecurity/litter management. Equally, the farmers showed a need for information regarding types of

**Table 5.** Factors influencing information needs

Variable	Coefficient	Std. Error	Z-statistic	Prob.
Age (X <sub>1</sub> )	-0.007990	0.003850	-2.075324**	0.0404
Gender (X <sub>2</sub> )	0.185586	0.088441	2.098421**	0.0383
Marital status (X <sub>3</sub> )	-0.042175	0.073963	-0.570220	0.5698
Household size (X <sub>4</sub> )	-0.019807	0.010066	-1.967756**	0.0518
Educational level (X <sub>5</sub> )	-0.035845	0.010294	-3.481933***	0.0007
Farm size (X <sub>6</sub> )	4.83E-05	2.35E-05	2.057847**	0.0421
Farming experience (X <sub>7</sub> )	-0.032414	0.007900	-4.102935***	0.0001
Access to credit (X <sub>8</sub> )	-0.036547	0.069453	-0.526216	0.5999
Membership of association (X <sub>9</sub> )	-0.250825	0.066691	-3.760983***	0.0003
Constant	3.080046	0.194381	15.84538	0.0000

Source: Eviews 9 software \*\*, \*\*\* Significant at 5 and 1%, respectively

drinkers, sourcing, and type of feed, formulation of feed, and diet supplements. The study further revealed that farmers require information on culling, processing of meat, grading and storage of eggs, keeping records and accounts, insurance of farm, and sourcing of formal credit for the farm. Also, securing the farm from rodents, predators, and theft was also a need for the farmers. This outcome brings to the fore the need for farmers to directly access agricultural extension services locally, to get reliable agricultural information that will meet their peculiar needs. Information access has an extensive and multifaceted role in enhancing all aspects of agricultural production since innovations are being introduced periodically (Odemero and Oghenesuvwe, 2016; Ogunlade et al., 2017). This finding lends credence to the submission of Jibril et al. (2016) who revealed that farmers in Zamfara State require information on various aspects of poultry production, particularly biosecurity measures. The provision of unhindered access to information to farmers reduces their information needs and can substantially contribute to enhancing the farmers' ability to manage the farms efficiently to maximise gains (Okeoghene, 2013; Ajewole and Akinwumi, 2014; 2018).

**Factors influencing information needs**

The result of the ordinary least square multiple regression analysis used in identifying the factors influencing the information needs of the farmers is presented in Table 5. The model's coefficient of determination (R<sup>2</sup>) was 0.54 which implies that about 54% variability in the dependent variable was explained by the model. Out of the nine explanatory variables modelled, seven were statistically at various levels of significance. The variables were age, gender, household

size, educational level, farm size, farming experience, and membership in the association.

In this study, the regression coefficient for age was -0.0079 and significant at 5% probability level. This finding showed that need for information decreases with an increase in age and vice versa. This implies that as the farmer grows older, the need for information reduces and this may be attributed to accumulated experience over the years in poultry farming. Equally, the regression coefficient for gender was 0.1855 and significant at 5% level of significance. This suggests that information need was reduced for male farmers as compared to the female gender. This is due to some socio-cultural factors that limit females' access to wide social and economic capital in the area. Similarly, the results of this study have also shown the negative relationship between household-size and information needs of the respondents. The regression coefficient of this relationship was -0.0198 and significant at 5% probability level. This implies that a member increase in household size is expected to translate into a more proportionate decrease in the information needs of farmers. This can be attributed to the increase in social contacts and information due to the number of the members of the household. Also, the finding of the study showed that education had a regression coefficient of -0.0358 and the relation is statistically significant at 1% level of significance. In the same vein, the coefficient of education was -0.0463. This implies that the information need would decrease for respondents having formal education and vice versa. This implies that there is an inverse relationship between education and information need among the poultry farmers in the study area. This can be attributed to the notion that literacy equips farmers with the ability to source information from various sources on

their own without necessarily relying on agricultural extension agents. Furthermore, there was a positive (4.83E) and statistically significant (5%) relationship between farm size and the information need of farmers in the study area. The coefficient (-0.0324) of farming experience of the respondents revealed that there is a significant relationship between farming experience and information need. This denotes that experienced poultry farmers in the study area have limited information needs and vice versa. The negative influence is expected because more experienced farmers may have good advantage of acquiring better skills and access to innovative information about improved poultry production practices. These findings lend credence to the submissions of Ogunlade et al. (2017) and Oladipo and Olaniyi (2020) who revealed that farming experience, age, and farm size were significantly related to the respondents' information needs in Kogi and Kwara States, respectively. Furthermore, membership in an association was negatively (-0.2508) associated with the poultry farmers' information needs at a 1% level of significance. This can be attributed to the fact that being a member of an association increases the farmers' social capital base and can also enhance their access to information.

### CONCLUSION AND RECOMMENDATIONS

Information is a key factor of production in poultry farming due to the ever-changing nature of the poultry farming business. Based on the findings of this study, farmers in the area rely mostly on electronic media (particularly the internet, radio, and television) and acquaintances/friends for information. This brings to the fore the challenge of having inadequate agricultural extension agents which have made farmers source information on their own. Similarly, the study indicated that farmers' information needs are influenced by their socio-economic characteristics, especially, membership in an association, educational level, and farming experience. Therefore, to enhance poultry farmers' unhindered access to information on various aspects of poultry production, the following recommendations are proffered:

- i) The government and other development partners should prioritize the employment of agricultural extension agents who can have direct contact with the farmers.
- ii) Existing agricultural extension agents should be motivated to widen their reach to farmers by using the internet frequently. This will require training the agricultural extension agents on ICT use and

also upgrading facilities at agricultural extension departments.

- iii) Poultry farmers should be encouraged to join farmers' associations to widen their social capital base and also enhance their access to relevant agricultural information.

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### CONFLICT OF INTEREST

The author declared no conflicts of interest with respect to research, authorship and publication of this article.

### ETHICAL COMPLIANCE

The authors have followed the ethical standards in conducting the research and preparing the manuscript.

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