DETERMINANTS OF RURAL WOMEN POULTRY FARMERS' ACCESS TO AGRICULTURAL INFORMATION IN IMO STATE, NIGERIA: A LOGIT MODEL ANALYSIS

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ABSTRACT

The study analyzed the determinants of rural women poultry farmers' access to agricultural information in Imo State, Nigeria. Data were obtained in 2015 with structured and validated questionnaire from 201 proportionately and randomly selected rural women poultry farmers. Data were analyzed using descriptive statistics (mean and percentage) and inferential statistics (logit model). Results showed that extension contacts, attendance to agricultural extension seminars and workshops, as well as accessibility of media methods were very poor. Determinants, of rural women poultry farmers' access to agricultural information were age, education level, frequency of attendance to associations' meetings, farming experience, farm size, attendance to agricultural extension seminars and workshops, access to credit, and accessibility to media methods. Rural women poultry farmers should be encouraged to participate actively in extension services organized trainings, seminars and workshops to improve their access to agricultural information.

Keywords: *Access, Agricultural information, rural women, poultry farmer, logit model, Imo State, Nigeria*

INTRODUCTION

Agriculture is the backbone of Nigerian economy as it plays an important role in contributing to food security, poverty reduction, livelihoods improvement, rural development and the environment (Auta *et al*, 2000; Ohajianya, 2009). Women play a significant and crucial role in agriculture and allied fields including crop production, livestock, horticulture, post harvest operations, etc.

Various researches conducted on the contribution of women to agricultural development in Nigeria (Amali; 1989; Saito and Spurling, suggest that women contribution to the farm work is as high as between 60% and 90% of the total farm task performed.

Despite the dominant and important role women play in agricultural production in the country, they are hardly given expected attention in the area of training and or visitation by extension agents with improved technologies, and agricultural information. Poultry farming is one of the livestock enterprises undertaken by rural women to provide additional income and create self-employment (Ahmed and Hamid, 1992).

Information is a necessary component of agricultural extension and one of the resources required for the improvement of agricultural production (CTA, 1997). Agricultural information are mostly delivered through various media such as television, radio, newspaper, bulletin, and pamphlets (Adesope *et al*, 2007;, Meera et al., 2004). Information is the potential ingredient for the advancement of agriculture. Agricultural information has been defined as all published or unpublished knowledge on all aspects of agriculture (Adesope *et .al.*, 2007). Agricultural information does not only serve as a source of information on new technologies for farmers but also ensures access to improved technologies and contributes to improving the welfare of farmers (CTA, 1997; Kerrigan *et al*., 1994).

Agricultural information serves as a channel through which farmers challenges could be identified for research and formulation of agricultural policies to the benefit of rural farmers Abdallah and (Abdallah-Rahman, 2016). The various potencies of agricultural information make it necessary for every farmer including rural women poultry farmers to access the services. The question is whether rural women poultry farmers are really accessing the agricultural information provided by extension services in Imo State? Since much literature has not been documented on the factors that influence rural women poultry farmers' access to agricultural information, this study seeks to provide these determinants.

METHODOLOGY

This study was conducted in Imo State of Nigeria. The state lies between latitudes 5^0 10' N and 6^0 35' N of the equation, and longitudes 60 35'E and 7^0 28' E. It is in the tropical rainforest zone of Nigeria with mean annual temperature of 27^0 C and mean annual rainfall of 2230 mm (Nwosu and Onwuemedo, 2005). The predominant occupation of the people is farming. Major crops grown include yam, cassava, cocoyam, maize, vegetables, oil palm, rice, etc, while the types of livestock raised includes, goats, sheep, rabbits, poultry, pigs, etc. Agricultural information are provided to the farmers by the extension services through mass media methods of radio, television, newsletters, pamphlets, bulletin, etc.

Imo State comprises three agricultural zones of Owerri, Orlu and Okigwe, sub divided into 27 Local Government Areas (LGAs).

A list of registered rural women poultry farmers was obtained from the officials of poultry farmers associations in each L.G A Per agricultural zone. The two rural LGA in each agricultural zone with the highest number of registered women poultry farmers were purposively selected for the study. Thus, Ngor-Okpala and Ahaizu Mbaise LGAs were selected from Owerri agricultural zone;

Njaba and Oru West LGAs were selected from Orlu agricultural zone; while Obowo and Ehime Mbano LGAs were selected from Okigwe agricultural zone.

From the sampling frames of 127, 186 and 89 registered women poultry farmers from Owerri, Orlu and Okigwe agricultural zones respectively totaling 402 rural women poultry farmers, a sample size of 201 farmers was determined using the sample size model (Yamane, 1967);

$$n = \frac{N}{1+N(e^2)} \quad - \quad - \quad - \quad (1)$$

where ; n=sample size for the study, N=total sampling frame, and e=tolerable error level of 0.05. Proportionate sampling techniques was applied to select 64, 93 and 44 women poultry farmers from Owerri, Orlu and Okigwe agricultural zones respectively from their sampling frames of 127, 186 and 89 women poultry farmers respectively. The proportionate sampling model as used by Ohajianya and Onuoha (2005) was employed as;

$$n_h = N_h \left(\frac{n}{N}\right) \quad - \quad - \quad - \quad - \quad -(2)$$

where; n_h=sample size selected from each agricultural zone, N_h= sampling frame in each agricultural zone, N=total sampling frame in the three agricultural zones and n=sample size for the study.

Simple random sampling was finally employed to select the sample size of 201rural women poultry farmers for the study.

Data for this study were collected mainly from primary sources, using structured and validated questionnaire.

Data were collected between July and December, 2015 by trained enumerators under the close supervision of the researchers.

Data Analysis

The data obtained were analyzed using descriptive statistics (percentage and mean), for the socio-economic characteristics of farmers, and inferential

statistics (logit model) to estimate the determinants of rural women poultry farmers access to agricultural information.

Analytical Model

Determinants of rural women access to agricultural information can be estimated using the probit or logit models especially when the dichotomous nature of the dependent variable is taken into consideration. Logit and probit models translate the values of the independent variables (x_i), which may range from-00 to + 00 as into a probability, for (Y_i), which ranges from "O" to 'I" and compel the disturbance terms to be homoscedastic. This makes selection between the two models very sticky as both models provide equally efficient parameters. The forms of probability functions depend on the distribution of the difference between the error terms associated with a particular choice. The probit and logit models assume the existence of an underlying latent variable for which a dichotomous realization is observed (Maddala, 1983; Peng et al., 2002), thus giving the model;

$$Y_i^* = B_0 + \sum_{J=}^{k} B_i X_{ij} + e_i \quad - \quad - \quad - \quad (3)$$

where; Y_i^* is a latent variable (not observable) and what is observed is a dummy variable, Y_i defined as; 0 if otherwise 1 if yo>0 - - - (4)

In order to estimate the probabilities of rural women poultry farmers access to agricultural information or non –access in this study, the logit model as used by Abdalla and Abdul Rayhaman (2016) was used since the results are similar with probit.

The logit model is therefore specified as;

$$\text{Log} \left(\frac{P_i}{I-P_i} \right) = \sum Bj\, X_{\,i}j + \Sigma_i \quad - \quad - \quad - \quad (5)$$

The probability that a rural woman poultry farmer has access to agricultural information is denoted as P = P (Y=1) and the probability that a rural woman poultry farmer has no access to agricultural information is denoted as P =P

(Y=O). Thus P_i represents conditional probability that a woman poultry farmer has access to agricultural information, while ($I-P_i$) denotes conditional probability that a woman poultry farmer has no access to agricultural information. B_{js} are vectors of coefficients to be estimated; X_{js} are vectors of explanatory variables, and Σ_i is the error term.

The explanatory variables are;

X_i=Age (years)

X_2=Education level (years spent in school)

X_3= household size (number of persons)

X_4=Net Annual farm income

X_5=frequency of attendance to associations' meetings (Number of times per annum)

X_6=Farming experience (years)

X_7=Farm size (Number of birds)

X_8=Extension contacts (Number of visit per annum)

X_9= Ownership of media method (Dummy; 1 if owned, O if otherwise)

X_{10}=Attendance to agricultural seminars and workshops (Number attended per annum)

X_{11}=Access to credit (Dummy; 1 if farmer has access, O if otherwise)

X_{12}=Accessibility to media method (Dummy; 1 if accessible, O if otherwise).

It is expected a priori that the coefficients of X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, $X_{10,}$ X_{11}, X_{12} >0; X_1 <0.

RESULTS AND DISCUSSION

Summary statistics of variables

Table 1 presents the summary statistics of variables included in the logit regression estimations. The mean age of a farmer is 40 years with 11years of experience. The level of education of the women poultry farmers was 8 years.

Average household size was 9 persons. The average net annual farm income was ₦206,483. Only 12% of the women farmers have access to credit. The average number of visits made by extension agents was 0.43, and only 47% of the farmers have functional media method. Mean attendance to association meetings was 0.64 per annum, while only 39% of women poultry farmers have access to media methods and mean attendance to seminars and workshops was 0.19 per annum.

Table 1: Summary statistics of variables included in the logit model.

Variable	Mean	Standard Deviation
Age (years)	40	9.03
Education level (Years)	8	5.12
Household size (Number of persons)	9	4.32
Net Annual farm income (Naira)	206483	537.16
Frequency of attendance to associations		
Meetings (number of attendance)	0.64	0.42
Farming experience (years)	11	6.17
Farm size (number of birds)		
Extension contacts (number of visits)	0.43	0.22
Attendance to agricultural		
Seminars & workshops (number of times)	0.19	0.08
Ownership of media method	0.47	0.29
(Dummy; 1 if owned, o if otherwise)		
Accessibility of media method (Dummy;	0.39	0.21
1 if farmer has access, o if otherwise)		

Source: Field Data, 2015

Determinants of rural women poultry farmers' access to agricultural information

The logistic regression results are presented in Table 2. Post estimation indicates that there were no econometric problems of multicollinearity as the predicted variance inflation factors of all the variables were found to be less than 10. The results of logistic regression indicate a reasonable degree of uniformity regarding the sign of the parameter estimates and statistical significance at 0.01 and 0.05 levels of probability.

The Chi-square value was 78.25 which was statistically significant at 1% level, implying that all the variables jointly determine the dependent variable. The high Chi-square value indicates that the over all significance of the logit model is satisfactory.

The coefficient of age (X_1) was positive and significant at 5% level and disagrees with our a prior expectation. This implies that older farmers are less likely to access agricultural information.

This could be because older farmers may not be strong enough to attend to meetings regularly, access and use the media methods available.

This result is consistent with Catherine et al (2012) who found the likelihood of access to extension services to decline with age and contradicts with that of Abdallah and Abdul-Rahaman (2016) who found that access to agricultural extension services increase with age.

Education level (X_2) was positive and significant at 1% level, which implies that the probability of accessing agricultural information is higher among the literate women poultry farmers. Education provides a farmer an opportunity to read and understand manuscripts as well as posters about agricultural innovations, extension teachings, practices, and programmes.

The result supports earlier studies by Doss and Morrris (2001), Foltz (2003), and Lapar and Paridey (1999) who found that farmers who have better education tend to have greater probability of accepting new ideas than their illiterate counterparts.

The coefficient of frequency of attendance to associations' meetings (X_5) was positive and significant at 5% level, which implies that women poultry farmers that attend their associations' meetings more regularly tend to have greater probability of accessing agricultural information than their counterparts that do not attend meetings regularly.

Table 2. Maximum likelihood Estimation of the factors that influence rural women poultry farmer' access to agricultural information

Variable	Coefficient	Z-Value
Constant	-6.718	-4.813**
Age (X_1)	0.492	2.529*
Education level (X_2)	0.318	3.415*
Household size (X_3)	0.404	1.803
Net Annual farm income (X_4)	0.513	1.922
Frequency of attendance to association' meetings (X_5)	0.081	2.469*
Farming experience (X_6)	0.443	3.116**
Farm size (X_7)	0.506	2.813**
Extension contact (X_8)	0.037	1.752
Ownership of media method (X_9)	0.025	1.883
Attendance to agricultural seminars & workshops (X_{10})	0.077	2.417*
Access to credit (X_{11})	0.069	2.533*
Accessibility to media methods (X_{12})	0.045	2.892**
Chi-square (χ_2)	78.25	
Significance	0.0000	
Log likelihood	-71.316	
Number of observations	201	

*Significant at 5% level
** Significant at 1% level
Source: Summary of logistic regression analysis, 2015

The coefficient of farming experience (X_6) was positive and significant at 1% level. This denotes that farming experience hastens the probability of farmer access to agricultural information. Farm size (X_7) was positive and significant at 1% level which implies that the probability of accessing agricultural information is higher for women poultry farmers with relatively large farms. This findings is consistent with our a priori expectations and similar to finding of other studies such as Abara and Singh (1993), Kasenge (1998) and Hartwich et al (2007).

Attendance to agricultural extension seminars and workshops (X_{10}) was positive and significant at 5% level, which indicates that women poultry farmers who attend agricultural extension seminars and workshops regularly tend to have greater probability of access to agricultural information than their counterparts that do not attend agricultural extension seminars and workshops. Access to credit (X_{11}) was positive and significant at 5% level, which denotes that women poultry farmers with higher access to credit tend to have greater probability of accessing agricultural information than their counterparts with low access to credit.

The coefficient of accessibility to media methods (X_{12}) was positive and significant at 1% level. This direct and significant relationship between access to agricultural information and accessibility of media methods denotes that women poultry farmers who have higher accessibility to media methods tend to have greater probability of accessing agricultural information than their counterparts that have poor accessibility to media methods in the study area.
These significant variables are the determinants of rural women poultry farmers access to agricultural information in the study area.

The coefficients of household size (X_3), net annul farm income (X_4), extension contact (X_5) and ownership of media method (X_9) were not statistically significant at 5% level, implying that they are not determinants of rural women poultry farmers access to agricultural information in Imo State.

CONCLUSION AND RECOMMENDATIONS

The study was conducted to estimate the determinants of rural women poultry farmers' access to agricultural information in Imo State, Nigeria. Extension contacts, attendance to agricultural extension seminars and workshops as well as accessibility of media methods were very poor. The study found that age, education level, frequency of attendance to associations' meetings, farming experience, farm size, attendance to agricultural extension seminars and workshops, access to credit, and accessibility to media methods were the determinants of rural woman poultry farmers' access to agricultural information in Imo State.

The study recommends that rural women poultry farmers should be encouraged to participate actively in extension services organized trainings, seminars and workshops to improve their access to agricultural information. Government and stakeholders can improve accessibility of agricultural information to the rural women poultry farmers through the motivation of extension personnel to deliver agricultural information to the farmers using media methods available to the farmers.

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