

FACTORS AFFECTING THE ACCESS OF WOMEN TO POULTRY EXTENSION SERVICES IN NORTH WESTERN TIGRAY, ETHIOPIA

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ABSTRACT: *The main objective of this study was to identify factors that affecting the access of women to poultry extension services in North-Western zone, Tigray. The necessary data were generated from primary data of selected sites. The data were subjected to logit econometric regression analysis. The result of the logistic regression model estimate revealed that out of the 10 factors, 5 variables were found to have a significant influence on the probability of women to access of poultry extension service. These are household size, farm land size, access to information about poultry extension, number of visits by extension agent, access to poultry production training. The coefficients of access to information about poultry extension service and numbers of visits by extension agent were statistically significant at 1 percent probability level of significance where as household size and access to poultry production training were statistically significant at 5 percent probability level of significance.*

KEYWORDS: Extension Service, Intervention, Poultry, Women Household

INTRODUCTION

Poultry production is an important sector in Ethiopia where chickens and their products are important sources of food and income. Backyard poultry in extremely poor areas of the country play important economic, nutritional and socio-cultural roles in the livelihoods of the rural households. (Tadelle and Ogle, 2001). In general, backyard poultry production contributes significant role to food security, poverty alleviation especially for the poorer members of the community by diversifying agricultural production including increased distribution of resources through involvement of women (Guéye, 2009). Therefore it is appropriate system for supplying the fast growing human population with high quality protein and provides additional income to resource-poor farmers, especially women. It is also a source of employment for underprivileged groups like women in many local communities (Mengesha *et al.*, 2008).

Poultry keeping in most of the developing countries is the responsibility of women. It is one of the production system used to address gender issues in agricultural production activities (Guèye, 2009). Women in most cases are noted for backyard poultry keeping along with their prominent role in post harvest handling (Umunna *et al.* 2012). Chickens and eggs in many cases are the only and most common items women commercialize in the market and they provide women with immediate income to cover household expenses (Aklilu, 2007). It is therefore important to actively involve women in the process of poultry improvement, which actually has been neglected in the past. Most of the poultry extension workers and vaccinators are men but Women often have an important role in the development of family poultry production and it is traditionally the role of women in many developing countries (Dessie and Ogle, 2001). Although women carry out the leading role in the activity related to livestock and poultry rearing, they gain less access to training programs on poultry production improvement techniques than men. As the result, an attempt to improve productivity in rural poultry farming

suffers Therefore, identifying the factors that affecting the access of women to poultry extension services was necessary to improve the sector and thereby the livelihood of women poultry producers. The objective of this study was to identify factors that affecting the access of women to poultry extension services.

MATERIAL AND METHODS

Description of The Study Area

The study was conducted in three districts of North-Western Tigray. This zone is one of the potential areas for backyard poultry production. In addition, poultry meat and egg consumption is high due to the presence of dense population such as military camps, refugee and urban residents. North-Western zone is located between 14°00'N latitude 37°50'E longitude and 14.20°N latitude 38.25°E longitude Coordinates approximately 1078 km north of Addis Ababa, the capital city of Ethiopia. Altitude of the area is ranging from 1600 to 2200 m asl. The study area receives annual rainfall ranging from 700 to 1135 mm with maximum and minimum daily temperature of 35°C & 18°C. The production system is mixed farming, comprised of crop and livestock production.

Sampling Technique and Sample Size Determination

North-West zone has 8 districts out of these, 3 districts were selected based on their potential in poultry production and 2 Tabias from each district were selected randomly. From the total women headed households, those who rear at least one chicken were identified as poultry producers. The total number of women headed poultry producers in the selected districts were 1816. Then sample of women headed poultry producers were taken from each Tabia proportionally and Yemane formula was applied to determine the total sample size.

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

Where, N= total population, n= sample size, e= the level of precision /Acceptable error

N = 1816 is number of women headed households who rear chickens in the selected districts
e = 7% (0.07) level of precision.

$$n = \frac{1816}{1 + 1816(0.07)^2} = 183$$

According the above formula, 183 samples were taken from women headed poultry producers.

Data Collection Method

Data was collected by interviewing the producers using semi-structured questionnaire. The questionnaire was tested in one Tabia to examine and to correct some technical mistakes. Secondary data like type of poultry extension services provided in the area were collected from the Wereda and Tabia Agriculture and Rural Development office.

Data Analysis

Statistical analysis of the primary quantitative and qualitative data was made using Stata 10 software. To identify factors that affecting the access of women to poultry extension services, we used econometrics model. In this case, logit model was employed. The dependant variable in this case is dummy variable which takes a value of zero or one on whether women have access to poultry extension services or not.

Following Gujarati (1995) and Green (2003), the functional form of logit model is specified as follows:

$$P(Y_i = 1) = \frac{1}{1 + e^{-(\beta_0 + \beta_i X_i)}} \dots\dots\dots(1)$$

For ease of exposition, we write (1) as:-

$$P(Y_i = 1) = \frac{1}{1 + e^{-Z_i}} \dots\dots\dots(2)$$

Where: P (Y_i=1) is the probability that women have access to poultry extension service, Z_i= the function of a vector of n explanatory variables), e- represents the base of natural logarithms and equation (2) is the cumulative distribution function. If P (Y_i=1) is the probability of women have accessed to poultry extension service, then 1- P (Y_i=0) represents the probability of women not access poultry extension service and is expressed as:

$$1 - P(Y_i = 1) = 1 - \frac{1}{1 + e^{-Z_i}} = \frac{1}{1 + e^{Z_i}} \dots\dots\dots(3)$$

Therefore we can write:-

$$\frac{P(Y_i = 1)}{1 - P(Y_i = 1)} = \frac{1 + e^{Z_i}}{1 + e^{-Z_i}} = e^{Z_i} \dots\dots\dots (4)$$

Equation (4) simply is the odds ratio, the ratio of the probability that a women household will be access to poultry extension service to the probability that it will be not access to poultry extension service. Taking the natural log of equation (4), we obtain

$$L_i = \ln \left(\frac{P(Y_i = 1)}{1 - P(Y = 1_i)} \right) = Z_i \dots\dots\dots (5)$$

Where: \ln is the log of the odds ratio which is not only linear in the explanatory variables but in the parameters also.

Thus introducing the stochastic error term (u_i), the logit model can be written as.

$$Z_i = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \dots + \beta_n X_n + u_i$$

..... (6)

Where:

β_0 is an intercept

$\beta_1, \beta_2, \dots, \beta_n$ are slopes of the equation in the model

X_i = is vector of relevant household characteristics

RESULT

Econometric Analysis

As it was discussed in the methodology part of this paper, a logit model was selected to analyze factors affecting the access of women to poultry extension services in the study area. However, before fitting the logit model, it was important to check whether serious problem of multicollinearity and associations exists among and between the potential continuous and discrete explanatory variables. The problem of multicollinearity can be expressed as violation of the assumption of covariance between variables should be equal to zero. Hence, the avoidance of such problem enables the explanatory variable can separately contribute to the variation in the dependent variable. For this purpose, Variance Inflation Factor (VIF) and contingency coefficients were computed for, the continuous and discrete variables, respectively. STATA version 10 was used for data analysis. The value of VIF greater than or equal to 10 is an indicator for existence of serious problem of multicollinearity problem and it is important to omit such variable from model estimation. In the present analysis the VIF of all continuous variables were found to be less than 10. Thus, there were no as such serious of multicollinearity problem among variables and all five continuous explanatory variables were entered in to model estimation.

The result of the logistic regression model estimate revealed that out of the 10 factors, 5 variables were found to have a significant influence on the probability of women to access of poultry extension service. These variables include household size, farm land size, access to information about poultry extension service, number of visits by extension agent, access to poultry production training. That means the coefficients of access to information about poultry extension service and numbers of visits by extension agent were statistically significant at 1 percent probability level of significance whereas household size and access to poultry production training were statistically significant at 5 percent probability level of significance. Furthermore, the coefficient of farm land size was significant at 10 percent probability level. The coefficients of 5 explanatory variables namely age of the respondent, household head education, access to credit service, access to visit other place and participation on different extension events were not statistically different from zero at the conventional levels of

significance. The code, type, variable description and result obtained from the logit model are presented in the table1 and 2, respectively.

Table 1 Description of variables included in the model estimation

Code	Type	Description
Sizehh	Continuous	Household size in number
Age	Continuous	Age of respondent in year
Edu	Continuous	Level of household head education
Farland	Continuous	Farm land size in hectare
Infopol ex	Dummy	1, if respondent has access of poultry extension information, 0 otherwise
Extvisit	Contnous	Number of times visited by extension agents
Credit	Dummy	1, if household got credit, 0 otherwise
Acc trai p.prod	Dummy	1, if household has access of training on poultry production, 0 otherwise
Areavist	Dummy	1, if household has access to visit other place, 0 otherwise
Parti ext event	Dummy	1, if household has access to participate on different extension events, 0 otherwise

Source: author's computation

Table 2 Logit result for factors affecting the access of women to poultry extension services

Variables	Coefficient	Stand. Error	p-value	Odds ratio	Marginal Effec (dy/dx)
Age	.0880862	.0605258	0.146	1.102186	.0164493
HHSize	1.198342	.5765066	0.038**	3.024338	.2237789
Educ	-.8343707	.5649194	0.140	.4341476	-.1558108
Farland	-4.253651	2.2827	0.062*	.0142122	-.7943289
Infopol ex	5.872037	2.299335	0.011***	354.9713	.8935533
Extvisit	2.099704	.776657	0.007***	8.163751	.3920997
Acc trai p.prod	4.309617	1.939888	0.026 **	42.02262	.8935533
Credit	2.070819	1.314873	0.115	7.931318	.4147376
Areavist	1.763448	1.393109	0.206	5.832513	.3408494
Parti ext event	.4320365	.6105332	0.479	1.540391	.0806787
_cons	-18.99226	6.597209	0.004		
Number of obs	183				
Wald chi2(10)	66.15				
Prob > chi2	0.0000				
Pseudo R2	0.6149				
Count R ²	89.29				

Source: Model output, Count R² implies prediction success, * dy/dx is for discrete change of dummy variable, *** Significant at the 1% level; **Significant at the 5% level, *significant at 10% level

DISCUSSION

In light of the above summarized model results possible explanation for each significant independent variable are given consecutively as follows:

Household size: As pinpointed in various literatures, household size is identified as one of the important demographic factors that affect women to access poultry extension service. In this study, the household size was found to be significantly affects women to access poultry extension service. The coefficient for household size was found to be positively related with access to extension service and statistically significant at 5 percent probability level. This indicates that larger household size has more access to poultry extension service compared to smaller household size in the study area. The odds ratio of 3.024 implies that, other things being constant, the odds ratio in favor of being access to poultry extension service increase by a factor of 3.024 as household size increase by a unit.

Farm land size: This variable affects status of women access to poultry extension service negatively and significantly at 10 percent probability level in the study area. The negative relationship implies that women who have more farm land have less chance to access poultry extension services than less land size owned women. This is possible because large farm size women use their land for crop production so that they use extension service for crop production rather than poultry production. The odds ratio of .0142 implies that, other things being constant, the odds ratio in favor of being access to poultry extension service decrease by a factor of 0.0142 as farm land size increase by a hectare.

Access to information: This variable affects women poultry extension service positively and significantly at 1 percent probability level. The positive relationship indicates that women who have access to information on poultry extension service are more poultry extension service beneficiary and participant than less informant women households. The odds ratio of 354.97 implies that, other things being constant, the odds ratio in favor of being access to poultry extension service increase by a factor of 354.97.

Number of Extension agent visits: The sign of the coefficient of this variable showed a positive relationship with access to extension service and is significant at 1 percent probability level. The positive relationship implies that women households who are visited by extension agents many times have more access to poultry extension service than less visited women households in the study area. The odds ratio of 8.163 implies that, other things being constant, the odds ratio in favor of being access to poultry extension service increase by a factor of 8.163 as extension agents visit women household one extra time.

Access to training on poultry production: This variable is significant at 5 percent probability level. It has a positive relationship with access to extension service in the study area. The positive relation indicates that women households who have access to training on poultry production are more likely benefit poultry extension service than no access one. The odds ratio of 42.02 implies that, other things being constant, the odds ratio in favor of being access to poultry extension service increase by a factor of 42.02 as women have access a unit training on poultry production.

The coefficients of 5 explanatory variables namely age of the respondent, household head education, access to credit service, access to visit other place and participation on different

extension events were not statistically different from zero at the conventional levels of significance.

CONCLUSIONS

From this study it was concluded that poultry production is more appropriate sector to land less women headed households or with small size of farm land, small family size and low educational background. Out of the 10 factors, household size, farm land size, access to information about poultry extension service, number of visits by extension agent, access to poultry production training were found to have a significant influence on the probability of women to access of poultry extension service. That means the coefficients of access to information about poultry extension service and numbers of visits by extension agent were statistically significant at 1 percent probability level of significance where as household size and access to poultry production training were statistically significant at 5 percent probability level of significance. Furthermore, the coefficient of farm land size was significant at 10 percent probability level.

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