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INFLUENCE OF SOCIOECONOMIC FACTORS ON WOMEN FARMERS' ACCESS TO AGRICULTURAL INFORMATION IN MADAGALI LOCAL GOVERNMENT AREA OF ADAMAWA STATE, NIGERIA

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ABSTRACT

The study was carried out to analyze the influence of socio-economic factors on women farmer's access to agricultural information in Madagali Local Government Area of Adamawa State, Nigeria. The study sought to describe the socio-economic characteristics of rural women farmers and identity the sources of agricultural information available to them, examine the types of agricultural information accessed by them and identity the constraints to access information. Primary data was obtained through purposive and simple random sampling techniques using 180 respondents. Data were analyzed using descriptive statistic logit regression and Likert type rating scale. The findings revealed that age, educational level, extension contact, and societal affiliation are significant in influencing the level of access to agricultural information by the rural women farmers. Poor extension contacts, illiteracy, poverty, crowded household chores and shyness to access information were also identified as some of the constraints to accessing information. It is therefore recommended that there should be close co-ordination between agricultural extension agents of Adamawa state Agricultural Development Programme (AADP), Ministry of Information, private agencies, and international donor agencies for effective delivery of agricultural information among rural women farmers. Multiple sources of information such as face to face prints and deployment of Information and Communication Technology to deliver information to rural women farmers should be encouraged. Recruitment and training of more female extension agents should be encouraged to raise the number of women extension workers.

Keywords: *Information, Cowpea, Women, Likert, Logit Regression*

INTRODUCTION

In developing countries, one serious constraint to agricultural development is the limit to agricultural information; this has given rise to call for sustainable agricultural extension policy in rural areas. The concept of information and agricultural information in particular, as a source for development is just beginning to gain ground in most developing nations. Government policy makers, planners and administrators are increasingly recognizing the fact that information is indispensable to the development process. Hanna (1991) noted with concern that the essential social and information mechanisms were not sufficiently developed in most nations to foster generations, storage, preservation, repacking, dissemination and utilization of information communication. Rogers and Shoemaker (1973) opined that, communication is a process by which an idea is transferred from a source to a recipient with the intent to change his behaviour.

The aim of communication is to bring about changes or modification of receiver's behaviour in terms of knowledge, attitude or skill in essence the desired effect of communication among rural-women is alternated in overt or covert behaviors of individuals (Thayer 1968; Rogers and Agarwala, 1976). The usefulness of a communication medium for farmer will vary according to the adoption phase in which a potential adopter of an innovation passes. It is of great relevance to know that the complexity of human behaviour often lead to many limitations and problems in the communication process.

Yahya (2003) posited that in terms of extraneous perception or lack of interest by the target audience, interference on smooth operation of communication channels might be described as an undesirable element in the communication, stressing that, sender may lack fundamental knowledge about the subject matter or existing circumstances of the target audience and further maintained that the use of communication skill, media and methodologies is typically abhorred and fragmented. These have contributed to poor or low adaption of innovation by rural women farmers.

In order to meet the increasing demand for food by the population, modern ways of farming have to be developed and the use of different strategies integrated into extension programmes. Lack of interaction with change agent, which has to do with communication.

Ofouku *et al.,* (2005) observed that rural farmer's decision for or against the adoption of any improved production technology (innovations) is described as a mental process, consisting of several stages. This calls to mind that effective communication of the said technology is pertinent for the rural farmers to have positive thinking towards adopting the technology.

Over years, rural women farmers depend on indigenous or local knowledge for their agricultural practices (Norem *et al.,* 1988). Such knowledge refers to skill and experience gained through oral tradition and practiced over many generations. The utilization of such primitive skills by farmers especially rural women in Madagali local government area of Adamawa State, Nigeria, has not helped to improve agricultural yield, (Noren,Yodder and Martin, 1988)

All that is witnessed in our rural agricultural system range from poor farm yield or low productivity that is not sustainable. Agricultural information and communication are always meant to get to rural farmers via extension workers, radios, television, film shows, agricultural pamphlets, state and local government agricultural agencies etc. women received less agricultural resources and less agricultural information than their male counterparts (FAO 2011). Women area confronted with barriers to access information that result in deficit of information to the farmers.

MATERIALS AND METHODS

The study area

Madagali Local Government is located between latitudes 13.30^0N and 13.51^0N and longitudes 10.37^0 Eand 10.57^0 E. It is found at the extreme north of Adamawa State and is bounded to the north by Gwoza and to the west by Askira-Uba Local Government Areas of Borno State, Nigeria. In the south it is bounded by Michika Local Government of Adamawa State and in the East by Cameroon Republic. Madagali Local Government was one of the local governments created in 1991 and has an area of 893km^2.

The study area has a total population of 163.569 projected from the 2006 National Population Census; National Population Commission (NPC,2006) of this number of people 70% are Marghi by tribe, others include Matakam, Higgi, Vemgo, Wula, Fulani etc. Madagali Local Government is located at a high plain, associated with a number of mountains. The relief can therefore be divided into hilly and flat plains. The hilly plains consists of mainly series of hills covering most of the eastern parts from its boundary with Michika Local Government Area of Adamawa State to its boundary with Gwoza Local Government Area of Borno State along with Mandara highlands at its boundary with Cameroon Republic.

Sampling Procedure and Sample Size.

Multistage and Simple random sampling procedures were used to select respondents for this study. In the first stage, three out of the ten wards namely, Duhu, Kirchinga and Pallam were purposively selected due to the high women involvement in crop farming and the relatively higher number of women returnees after the insurgency.

In the second stage, three villages in each ward were also purposively selected for the same reason advanced earlier. Finally, women crop farmers were randomly selected from the selected villages in

proportion to the size of their population using the proportionality factor (Table 3.1) thus,

$$X_j = \frac{P}{P*} \times n \quad \text{.....(1)}$$

Where X_j= number of respondents to be sampled in each village
P=number of women farmers in a particular village
P*= Total number of women farmers in all the selected villages
n = sample size

Information on the population of the women crop farmers was obtained from the various State' Agricultural Development Programmes (ADP) , through Agricultural Extension Agents working in the selected villages as well as Women Farmers Associations. A sample size of 180 women farmers from a target population of 325 respondents was obtained using Taro Yamane formula (Polonia, 2013) as shown below:

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

Where, n = Sample size N = size of target population e = Limit of tolerance error (5% or 0.05) However, only 175 were returned with useful information, hence were used for the analysis.

Table 1: Sampling Procedure

Ward	Village	Sampling frame	Number of questionnaires administered	Number of questionnaires retrieved
Pallam	Pallam	50	28	27
	Kojoti	41	23	23
	Dzuel	24	13	12
Kirchinga	Kirchinga	42	23	22
	Kopa	29	16	16
	Wurogayandi	25	14	13
Duhu	Duhu	40	22	22
	Shuwa	42	23	22
	Mayowandu	32	18	18
Total	**9**	**325**	**180**	**175**

Source: Field Survey, 2016

Types and Method of data collection

Primary data were mainly used for the study and were obtained from rural women farmers in the study area using structured questionnaire. The service of well-trained indigenous female enumerators in the area were used to avoid communication barrier, cultural norms violation and to illicit favourable response from the respondents.

Method of data analysis

Data collected were analyzed using both descriptive and inferential statistical tools. Descriptive statistics involved the use of mean, frequency distribution, and percentages and Likert-type rating scale and binary logit regression were used to determine the socio-economic factors that influence level of access to agricultural information by women crop farmers in the study area.

A 3-point Likert-type scale with legends ranging from highly accessible = 3, Sometime accessible = 2, Not easily accessible = 1was used to determine the mean score for each of the respondents and subsequently their level of access to agricultural information.

The mean score was computed as follows:

$$\text{mean score for } i^{th} \text{ farmer} = \frac{\sum_{i=1}^{10} wx_i}{n} \quad \text{.....(3)}$$

Where,
w_i= weights used (3= highly accessible, 2=sometimes accessible, 1= Not easily accessible)
x_i= type of information accessed
n = total number of types of information accessed.

$$\text{rating mean score} = \frac{3+2+1}{3} = 2 \quad \text{.....(4)}$$

Decision:

i. *If mean score for $i^{th} \geq$ rating mean score signifies high access to agricultural information*
ii. *If mean score for i^{th} farmer< rating mean score signifies low access to agricultural information*

A binary logit model was employed in the study because of its comparable simplicity to probit and tobit regressions. By using the logistic regression the probability of a result being in one of two response groups (binary response) is modeled as a function of the level of one or more explanatory variables.

Thus, the probability of the extent of the women farmers' access to agricultural information is modeled as a function of the level of some socio-economic attributes. For this study, the response variable is 1, when the farmers had high access and 0, when they had low access. The functional form is denoted in equation (5) (Bahta and Bauer, 2007).

$$Y = ln\left(\frac{\emptyset_i}{1-\emptyset_i}\right) = \beta_0 + \sum_{j=1}^{k} \beta_j X_{ij} + \varepsilon_i \quad \text{.....(5)}$$

Where: Y is the response category (1 or 0), I denotes cases (1, 2, 3, 4.,…., 175), Ø is the conditional probability, β_0 is the coefficient of the constant term, β_j is the coefficient of the independent variable, X_{ij} is the matrix of observed values as presented in Table 3.2, ε_i is the matrix of unobserved random effects, $\frac{\emptyset_i}{1-\emptyset_i}$ is "*odd*", and $ln\left(\frac{\emptyset_i}{1-\emptyset_i}\right)$ is the logarithm of "odds".
Equation (5) can be manipulated to give the odds ratio using equation (6):

$$\frac{\emptyset_i}{1-\emptyset_i} = \exp\left(\beta_0 + \sum_{i=1}^{k} \beta_i X_i\right) \quad \text{.....(6)}$$

The probability of the extent of access was calculated using equation (7):

$$\emptyset_i = \frac{exp\left(\beta_0 + \sum_{i=1}^{k} \beta_j X_{ij}\right)}{1 + exp\left(\beta_0 + \sum_{i=1}^{k} \beta_j X_{ij}\right)} \quad \text{.....(7)}$$

Equation (7) is intrinsically linear since the logit is linear in X_i (Gujarati, 1988); it indicates that probability $\emptyset_i$ lies between zero and one and vary non-linearly with X_i. The equation for calculating partial effects of continuous variable is denoted by:

$$\frac{\partial \emptyset_i}{\partial x_i} = \emptyset_i(1-\emptyset)\beta_j \quad \text{.....(8)}$$

The partial effects of the discrete variables will be calculated by taking the difference of the mean probabilities estimated for the respective discrete variable, $X_i = 0$ and $X_i = 1$.

Table 2: Exogenous variables in the binary logit regression model

Variable	Measurement	Expected sign
Age	In years	±
Marital status	Binary variable (1=married, 0=otherwise)	+
Primary occupation	Binary variable (1=farmer, 0=otherwise)	+
Literacy level	Binary variable (1=literate, 0=otherwise)	±
Extension contact	Binary variable (1=access, 0=otherwise)	+
Membership of cooperative society	Binary variable (1=affiliated, 0= not affiliated)	+

RESULTS AND DISCUSSION

The results presented in Table 1-4 showed that most of the respondents, 32.57% fall within the age bracket of 30 -39 years, 31.43% were of 40 -49 age bracket with 14.85 % in the range of 20 -29 while only 7.43 % fell within age range of 60 years and above. From the Table, about 79% of the respondents fell within the age bracket of 20-49 years with 40 as the average years of the respondents. The implication for this is that, respondents were relatively young and within productive age range. The result of the study is in consonance with the findings by Omobolanle (2008) as cited in Rehman *et al.,* (2013) who disclosed that most of the women farmers being in their prime age and active are capable of been more productive and as such may be eager to seek and utilize relevant information for agricultural activities.

Table 3: Age of the respondents

Age range	Frequency	Percentage	Average
20 -29	26	14.85	
30 -39	57	32.57	
40 -49	55	31.43	40
50 -59	24	13.71	
60 - above	13	7.43	
TOTAL	**175**	**100**	

Marital Status of the Respondents

Result of analysis on Tables 1 and 2 revealed that majority 76.57% of the respondents were married, 12% were widowed and 8.57% were single while only 2.85% were divorced. The trend in this result showed that women famers in the study area been married are likely to be considered as more responsible and matured to access information for agricultural activities as they may be seen to make good use of it. The findings confirms Jilayu *et al.,* (2014) who found out in a study on " Performance of Improved agricultural technology information among small-scale alcohol consuming farmers in Madagali Local Government Area that 73% of the respondents were married . Similarly Fabiyi (2007 and Owolabi *et al* .,(2011) reported that married women are favourably disposed to attract support and sympathy even from male counterparts in affairs of agricultural activities since such activities contribute to the upkeep of the family.

Table 4: Distribution of the Respondents based on Marital Status

Marital status	Frequency	Percentage
Single	15	8.57
Married	134	76.57
Widowed	21	12
Divorced	5	2.85
TOTAL	175	100

Source: Field survey, 2016

Educational Level of the Respondents

The educational level of the respondents is also indicated in Table 5, the result revealed that 32.57 % had no formal education while 67.43% had one form of formal education or the other. The implication of this is that the literate women may easily access and utilize information. This result is in accordance with the findings of Owolabi *et al.,* (2011)who stated that educational level is important for the understanding of improved technologies, access and utilization of information, and that lack of formal education makes it difficult to utilise information or to obtain loans as most of the financial institutions requires formalities such as filling forms while extension materials are

usually printed in English. Education is a form of human capital for agricultural development as it influences farmer's decision because of its influence on the farmer's awareness, perception, reception and adoption of innovation that can bring about increase in production.

Since education has a great influence on the overall behaviour and disposition of individuals towards access to information, utilization as well as adoption of agricultural related innovations, the high percentage 67.43% of respondents of the study with one form of education or another is of great advantage to access to and utilization of agricultural information. This is in accordance with Sani *et al.,*(2014) who disclosed that more educated farmers are typically assumed to be able to process information and search for appropriate technologies to alleviate their production constraints. The belief is that education gives farmers the ability to perceive interpret and respond to new information much faster than their counterparts without education.

Table 5: Distribution of Respondents according to their Literacy Levels

Educational level	Frequency	Percentage
Non –formal education	57	32.57
Primary education	35	20
Secondary education	53	30.58
University / Tertiary	30	17.14
TOTAL	175	100

Source: Field survey, 2016

Table 6: Distribution of the Respondents based on their Average Monthly Income

Monthly income	Frequency	Percentage	Average
N5000 - 9000	28	16	
10,000 – 19,000	44	35.14	
20,000 – 29000	30	17.14	28,615.25
30,000 - 39, 000	26	14.86	
40,000 - 49,000	21	12.00	
50,000 - above	26	14.86	
TOTAL	**175**	**100**	

Source: Field survey, 2016

Sources of Income of the Respondents

Result in Table 7, showed that, majority (87.43%) obtained their income from sales of farm produce, 8.57% from salary while 4% has loan/credit as their source of income. The findings is in agreement with Bello (2012) who reported that most women farmers obtained their income from sale of farm produce and other farm activities in Adamawa state. This implies that most of the respondents depend on farm produce for their livelihood and thus would take every necessary step to obtain information that will enhance their productive capacity. Since most of the respondents derived their income from proceeds of the farm and from other informal sources such as friends, this could hinder their level of production on farm.

Table 7: Distribution of the Respondents according to their Source of Income

Source of income	Frequency	Percentage
Sales from farm produce	153	87.43
Salaries	15	8.57
Loan / credit	7	4
TOTAL	**175**	**100**

Source: Field survey, 2016

Farm Size of the Respondents

Farm size of respondents was also captured on Table 8 and the result showed that 26.28% cultivated between 1.5- 2 hectares of farm land, 21.71% had farm size of 2.5 – 3 ha and 19.42% cultivate an average of 3.5 -4 ha of farm land. Those who cultivated between 4.5 and 5.0 ha constituted 8.57% while 9.74%cultivate above 5.5 ha. The average farm size cultivated by the respondents was 2.5 ha of farm land; the result suggests that majority of the respondents were small-scale and subsistence farmers. This may not allow them to engage in large production or have access to credit facilities to improve on their productive abilities. The findings of the study lend credence to Maurice *et al.,* (2015) who asserted that majority of farmers in Adamawa state engage in small-scale farming with average of 2 ha farm land. The result of the study is in tandem with the findings of Owolabi *et al.,* (2011) who disclosed that most women farmer do not have access to credit facilities to invest in farming hence results in low income. This implies that, women farmers in the study area may not be able to invest in capital projects like modern farm technology and farm inputs as this normally attract huge financial obligation.The implication of this finding is that women farmers need to have more access to productive resources such as credit and land to enhance their capacity to produce more.

Table 8: Distribution of the Respondents based on their Farm Size

Farm size (ha)	Frequency	Percentage	Mean
0.5 -1	25	14.28	
1.5 – 2	46	26.28	
2.5 – 3	38	21.71	
3.5 - 4	34	19.42	2.52
4.5 – 5	15	8.57	
5.5 – above	17	9.74	
TOTAL	175	100	

Source: Field survey, 2016

Primary Occupation of the Respondents

Result of analysis on Table 9 shows that 80% 0f the respondents engaged in farming as their primary occupation while 18.29% were civil servants and 1.71% were into trading and other related businesses. This indicates that farming is the major occupation of the women farmers in the area.

Table 9: Distribution of the Respondents based on their Major Occupation

Major occupation	Frequency	Percentage
Farming	140	80
Civil service	32	18.29
Trading	3	1.71
TOTAL	**175**	**100**

Source: Field survey, 2016

Factors affecting the level of access to agricultural information by women farmers

The model was tested for specification error using link test. The result indicated a hat-square value of -0.2180(p-value =0.107).Thus the Null hypothesis that the model is not mis-specified cannot be rejected with a p-value of 0.107.The Hosmerand Lemeshow goodness of fit test has a Pearson chi-square value of 110.1 (p-value of 0.4657) indicating that our model fits the data well. There was also no problem of multicollinearity since none of the variance inflation factors (VIF) is at least10. The model also correctly predicted 81.14% of the dependent variables.

Result presented in Table 4.13 indicates that four of the variables included in the model(age and educational level, extension contact and cooperative society) were significant, while marital status and primary occupation were not significant.

Age

Sources of agricultural information and utilization by women farmers are determined by their age. It is hypothesized that young women are able to accessed and utilized agricultural information because they are active productive and eager to seek and utilize information as young farmers are keen to get knowledge and information then older women farmers. Elderly farmers are risk averse and less flexible and lesser likelihood of information utilization. This study found a negative but significant at 5% level relationship between age and access to agricultural information (Table 10). Furthermore, the result indicated that one year increase in age reduces the probability of having high access to agricultural information by 0.009.

Educational Level

Education influences farmer's information utilization. Educated people are expected to perform certain jobs and functions with higher efficiency and are also more likely to utilize information and new technologies in shorter period of time than uneducated people. The reason is that educated people can gather process and interpret all available information, differentiate between promising and unpromising investment areas and also make decision more easily with relatively small error. It is therefore, hypothesized that education will increase the probability of high access to agricultural information. Results in Table 10 revealed education had a negative but significant relationship with access to agricultural information. This implies that being literate reduces the intensity of access to agricultural information. This is contrary to the finding Bawa *et al.,* (2014) who reported positive relationship between education and access to agricultural information by maize farmers in Southern Borno, Nigeria. This is contrary to the finding of Kaltungi (2006) who reported that the more educated farmers had more access to information in rural Uganda. The negative sign could be as result of low level of education of the respondents since about one-third of the sampled respondents had no formal education and more than 50% were educated just up to secondary school. This low level of education among the sampled respondents had the tendency of negative consequences on access.

Extension contact

The major sources of agricultural information for farmers are extension agents. It is hypothesis that contact with extension workers will increase the level of access to agricultural information. The relationship between extension contact and level of access of agricultural information was found to be significant at ($p < 0.01$) as shown in Table 10. The result suggests that a unit increase in the number of visit by extension agents increases the probability of high access to agricultural information by 42%.

Cooperative society

One of the medium through which agricultural information are conveyed to farmers is cooperative society. It is hypothesized that being a member of cooperative society will increase a farmer's probability of getting access to agricultural information. The coefficient of the variable was positive and statistically significant at 10% (Table 10). This suggests being affiliated to a cooperative increases the probability of high access to agricultural information by 16%.

Table 10: Logit Regression Result for Factors influencing the Level of Access to Agricultural Information

Variable	Coefficient	Standard error	Z-value	P-value	Marginal effect
Age	-0.065	0.026	-2.52**	0.012	-0.009
Marital status	0.387	0.528	0.73	0.464	0.053
Primary occupation	-0.535	0.543	0.99	0.324	-0.083
Education	-1.371	0.560	-2.45**	0.014	-0.262
Extension contact	2.071	0.554	3.74***	0.000	0.419
Membership of cooperative society	0.929	0.525	1.77*	0.077	0.161
Constant	1.876	1.409	1.33	0.183	
Chi-square	43.46***				
Log likelihood	72.3404				
Number of respondents	175				

Source: Field survey 2016 *** Significant at 1% ** Significant at 5% * Significant at 10%

CONCLUSION

Based on the findings of the study it was concluded that younger women farmers were keener on getting information and utilizing same and that less educated women farmers have less access to agricultural information. Membership of cooperative societies played significant role in determining the level of access to agricultural information among the women crop farmers as well as extension contact. The study identified age, educational level, extension contact and non-membership of cooperative societies as major constraints to women access to agricultural information, and recommended that multiple source of information should be used by researchers, extension agents and other support services to deliver vital information to rural women farmers; while improving rural infrastructure such as electricity to enable rural farmers have access to and utilize modern communication methods and ICTS.

Recommendations

Based on the findings of this study the following recommendations are proffered.

Researchers, educators, extension agents, agricultural support service should use multiple source of information, (such as face to face prints and ICTs) to deliver information to rural women farmers.

Public and private media outlets should endeavour to incorporate vernacular or local dialects in addition to using indigenous communication mechanism. (e.g. Storytelling, drama songs etc in their programmes) to stimulate interest, attention and engender sense of belonging by respondents.

More female extension agents should be recruited and trained to raise the number of women extension workers available for women.

Poor extension contact was the most serious problem as claimed by 91.43% of the respondents. In view of this, the extension service should be strengthened and well -funded for effective and efficient service delivery. Furthermore, monitoring and evaluation of the extension agent should be intensified to ensure dedication to duty.

Finance is very important in buying some electronics needed to facilitate access to agriculture information. Lack of money as a result of poverty was reported by 68.57% of the respondents as a problem militating against their access to information. In view of this, the community leaders should ensure that useful agricultural information is passed to the women through places of worship or meetings.

Ignorance of information sources and shyness to seek information was claimed by 40% and 57.14%, respectively by the respondents as a problem to access to information. This could be as a result of low self-confidence due to low level of education. Therefore, it is recommended that adult literacy classes should be organized by the elites in the community to help raise the literacy levels of the women farmers as well as their self- confidence.

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