

## ASSESSMENT OF THE AWARENESS AND ADOPTION OF FARMER-TO-FARMER EXTENSION MODEL AMONG SMALL HOLDER FARMERS IN KOGI STATE, NIGERIA.

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### Abstract

*The study investigated the awareness and adoption of farmer-to-farmer extension model among small holder farmers in Kogi State, Nigeria. Specifically the study was designed to: describe the socioeconomic characteristics of farmers in the state; ascertain farmers awareness and adoption of the model and determine the influence of farmers socioeconomic characteristics on adoption. A multi stage random sampling technique was used to select 240 registered farmers for the study. Primary data were obtained through interview schedule and questionnaire administration. Data collected were analyzed using frequency count, percentage and mean, sigma score and binary logit regression. The research findings revealed that, 42.5% (sigma score = 4.400) of the respondents interviewed had no idea about the farmer-to-farmer extension approach, whereas 57.5% (sigma score = 4.876) claimed to understand the meaning of the farmer-to-farmer extension approach, the respondents that were aware and adopted of the approach 82.6% (sigma score = 5.560), while the remaining 17.4% (sigma score = 3.280) did not. The findings also revealed that farmers' socioeconomic characteristics which significantly influenced awareness of farmer-to-farmer extension model include education ( $P \leq 0.05$ ), Group discussion ( $P \leq 0.05$ ) farm size ( $P \leq 0.10$ ) and access to extension service ( $P \leq 0.01$ ) while those that significantly influenced adoption of the model were access to credit ( $P \leq 0.10$ ), education ( $P \leq 0.05$ ), e-media ( $P \leq 0.01$ ) and access to extension service ( $P \leq 0.05$ ). It is recommended that in order to increase more farmers' participation in this model, farmer with at least minimum level of education and more community social roles should be considered for selection as farmer extension facilitators since they have more chances of interacting with other farmers.*

**Keywords:** Awareness, adoption, farmer-to-farmer, extension model and small holder farmers.

### Introduction

Several organizations are involved in extension service provision in the country. These include public funded institutions such as the Ministry of Agriculture, agricultural-related commercial companies or the defunct marketing boards; a variety of Non-Governmental Organizations (NGOs) Farmer's associations etc. Following the decline in government extension services, community-based extension approaches has become increasingly important. One such approach is Farmer-to-Farmer Extension (F2FE), which is defined by

Franzeletal.(2015) as the provision of training by farmers to farmers, often through the creation of a structure of farmer-trainers.

Farmer-trainers train farmers on a range of practices covering livestock, crops, agroforestry and fisheries. Role and responsibilities of farmer-trainers vary such as training, monitoring/ following up, advising, conducting demonstrations, organising meetings and acting as liaison between farmers and development agents. In Farmer-to-farmer extension approach, the community organized in farmer groups, select an experienced and innovative farmer to be a "Lead farmer". Those farmers selected as lead farmers are also often called model/ master farmers or farmer-trainer etc. These lead farmers provide necessary extension services to their fellow farmers in their community, training, advice and demonstration etc. These farmers are rewarded for their services through payment from the farmer beneficiaries or farmer group (s). Thus, lead farmers do not provide free support to neighbours of choice, but to all interested farmers in their community or farmer group (s). In this model beneficiaries are fully involved in identifying problems, suggesting solutions and disseminating technologies and practices (Nalukwago, 2004).

According to Arokoyo (2011), one of the challenges of agricultural development in Nigeria is the inability of farmers to access vital information or the information is poorly disseminated, with inadequate feedback between farmers, research institutes and policy makers in the agricultural sector. The agricultural extension system in Nigeria has been known for a long time to depend on the use of mass media and extension agents for information dissemination and feedback (Nwachukwu, 2014). The system has been marred by a lot of challenges, especially in the areas of "feedback". The declining role of the public extension service created a delivery gap necessitating emergence of alternative Extension Service Provider (Rivera and Amanor, 1991, Swanson and Samy, 2002). Swanson and Samy (2002) further explain that, with the decline in government expenditure, public extension systems are not able to provide adequate educational and Technical extension programmes for all groups of farmers. Public extension has been less effective in responding to the basic educational needs of small scale, marginal farmers due to insufficient resources, lack of a continuing flow of appropriate technology, lack of staff motivation and misappropriation of fund, high cost of extension and lack of farmer participation for agricultural extension are often said

to be the most important concerns in any agricultural development approaches or models in developing countries such as Nigeria. Looking at the above scenario, the following research questions are therefore asked ; What are the socioeconomic characteristics of farmers in the state? Are farmers aware of the farmer-to-farmer extension approach? What is the influence of farmers' socioeconomic characteristics on the adoption of farmer –to-farmer extension model?

It is in view of the aforementioned research questions that this study was designed to assess adoption of farmer-to-farmer extension model among small holder farmers in Kogi State, Nigeria

### Methodology

The study was carried out in Kogi State, Nigeria. The state is located between latitude  $6^{\circ}30'N$  and  $8^{\circ}05'N$  and longitude  $5^{\circ}51'E$  and  $8^{\circ}00'E$ . The state is located in the central region of Nigeria. The headquarters of the state is Lokoja which is situated at the Confluence of rivers Niger and Benue making the state to be popularly known as the Confluence State. Kogi State has three (3) senatorial districts (Western, Central and Eastern senatorial districts) with each district inhabited by one of the three major tribes in the state. The Eastern senatorial district is inhabited by the Igala speaking population. The Central senatorial district is inhabited by Ebir people; while the Western senatorial district is inhabited by the Yoruba people. The state consists of 21 Local Government Areas. The state has boundary with nine (9) states namely; Federal Capital Territory (FCT) to the North, Nasarawa State to the north east, Benue State to the East, Enugu state to the south east, Anambra State to the south, Edo State to the south west, Ondo and Ekiti states to the west, Kwara State to the north west and Niger State to the north. Kogi State has a total population of about 4,205,546 people in 2014 (using the state projected growth rate) (NPC, 2007) and land area of about 30,354,74 square kilometers. The State has 2,774,700 hectares of land ( NBS, 2011) but only about 0.5 million hectares are under cultivation (Kogi State Economic Empowerment and Development Strategy, KOSEEDS, 2004). The state is made up of four Agricultural Zones namely; Zone A: AiyetroGbedde, Zone B: Anyigba, Zone C: Kotonkarfe, Zone D: Alloma.

The state is well endowed with river valleys and swampy lands for dry season farming. The major crops grown in the state are maize, yam, cassava, sorghum, rice, millet, cowpea, pigeon pea, groundnut, bambaranut , cocoyam, sweet potatoes, beniseed, melon. Major fruits produced in the state are oranges, grape, lemon, tangerine, plantain, banana, mango, pineapple and pawpaw. Tree crops grown in the state include; cocoa, cashew, oil palm, coffee and kola nut. For the purpose of this study registered farmers were randomly selected. A total of 240 farmers was selected for the study. Three

stage random sampling technique was used. In stage one, four (4) extension blocks were randomly selected from each of the agricultural zones (A, B, C, D), that gives a total of 16 extension blocks. In stage two, three (3) extension cells were randomly selected from each block, making a total of 48 extension cells. In stage three, five (5) registered farmers were randomly selected from each cell. A total of 240 farmers were used for study. Structured questionnaire and interview scheduled were used to obtain the primary data (taking cognizance of the set objectives). The data obtained were analyzed using both descriptive and inferential statistical tools. Frequency count, percentage and mean, sigma scoring method and binary logit regression were used respectively. Objective one (socioeconomic variables of respondents was analyzed using frequency count, percentage and mean). Objective two (awareness of farmer-to-farmer extension model was achieved using sigma scoring). Objective three (determinant influence of farmer's socioeconomic characteristics on adoption was achieved using Binary Logit Regression).The logit model was specified as shown below;

For Awareness, the implicit and explicit form of the model is given below:

$$\ln_{AW} = \ln(p/1-p)$$

$$\ln(P_{AW}/1-P_{AW}) = \beta_0 + B_1ACC + B_2EDU + B_3AGE + B_4DIS + B_5EME + B_6EXP + B_7FMS + \beta_8EXT + e_i$$

For Adoption, the implicit and explicit form of the model is given below:

$$\ln_{AD} = \ln(p/1-p)$$

$$\ln(P_{AD}/1-P_{AD}) = \beta_0 + B_1ACCE + B_2EDU + B_3AGE + B_4DIS + B_5EME + B_6EXP + B_7FMS + \beta_8EXT + e_i$$

Where;

AW = Awareness about farmer-to-farmer extension model. A dummy variable measured as 1 for aware and 0 otherwise

AD = Adoption of farmer-to-farmer extension model. A dummy variable measured as 1 for adopters and 0 otherwise

$P_{AW}$  = Probability of awareness about farmer-to-farmer extension model.

$P_{AD}$  = Probability of adoption of farmer-to-farmer extension model.

$1 - P_{AW}$  = probability of farmer not aware about farmer-to-farmer extension model

$1 - P_{AD}$  = probability of farmer not adopting the farmer-to-farmer extension model.

$\ln$  = Natural logarithm function.

$\beta_i$  = Vector of logistic regression coefficients.

$X_i$  = Vector of independent variables given as follows;

ACCE = Access to credit facilities; credit availed by a farmer and it is measured as 1 for credit availed and 0 otherwise.

EDU= Education level of a farmer in years.

AGE = Age of farmer in years.

DIS = Discussion; discussion with other farmers, a dummy variable which is 1 for discussion with other farmers and zero otherwise.

EME = E-media; E-media usage for agricultural information. E-media is a dichotomous dummy variable, which is 1 for those farmers who are using E-media otherwise 0.

EXP = Farming experience; experience of a farmer is categorical variable that is measured in years.

FMS = Farm size of a farmer; land holdings is a categorical variable that is measured in hectares.

EXT = Access to extension; access to extension is a dichotomous dummy variable that is 1 for those farmers who have access otherwise 0.

## Results and Discussion

### Socioeconomic variables of respondents

The socioeconomic characteristics of the respondents were presented in Table 1. According to the table, majority of the farmers were male with (80.8%) and the farmers interviewed was 41 to 60 years with mean age of 40+ 8.9 years standard deviation. The result revealed that (75.0%) of farmers in the area attained different levels of educational qualifications while (25.0%) had no formal education, (34.6%) had primary education, (33.3%) had secondary education (7.1%) of the farmers had tertiary education. The findings revealed that 75.0% of the respondents are literates, and high or fairly literate farmers may be favourably disposed to accept and adopt new technologies than

the illiterate ones. Adejo, *et al* (2012) reported that the more educated a farmer is the more he/she becomes more civilized and informal about scientific agricultural practices. A low education level of farmers also leads to farmers' poor ability to grasp the technologies presented to them (Abdullahi and Samah, 2013), which in turns leads to poor farmers' attendance at extension programmes as they find it difficult to conceptualize the concepts presented .Modibo*et al.* (2010), in their study of subsistence farmers in developing countries, found that majority of the farmers had only a primary level education and some had never gone to school. The table further revealed that most (64.2%) of the farmers had a household size of between 4-6 persons with a mean hectare of land under cultivation in the area was 2.7 +0.9 standard deviation and mean farming experience of about 20 years.

This implies that experience in agricultural activities is very important as it may influence awareness and subsequent adoption of the farmer -to -farmer extension approach. This is in consonance with Idrisa*et al.* (2012) who reported that experience depicts a good signal for adoption since experience helps to convince the farmer of the importance of innovation. Based on the findings the result also revealed that 56.7% of the farmers claimed they had access to extension services in the last farming season. The extension contact provides information that farmers obtain on their production activities as well as the importance of innovations through counseling and demonstrations by extension agents on a regular basis. It is believed that respondents who are not frequently visited by extension agents have lower possibilities of adoption than those frequently visited (Bamiri, *et al.* 2002).

**Table 1: Distribution of Respondents According to Socioeconomic Characteristics** N=240

Socioeconomic Variables	Frequency	Percentage	Mean
Sex			
Female	46	19.2	
Male	194	80.8	
Age (years)			
30 – 40	36	15.0	
41 – 50	73	30.4	40±8.9
51 – 60	115	47.9	
61 – 70	16	6.7	
Marital Status			
Married	199	82.9	
Single	28	11.7	
Widowed	11	0.4	
Widower	1	4.6	
Separated	1	0.4	
Household size (number)			
1 – 3	39	16.3	
4 – 6	154	64.2	5±1.8
7 – 9	36	15.0	
9 – 12	11	4.5	
Educational Background			
No formal education	60	25.0	

Primary education	83	34.6	
Secondary education	80	33.3	
Tertiary education	17	7.1	
Major Occupation			
Farming	173	72.1	
Civil service	19	7.9	
Trading	41	17.1	
Others	7	2.9	
Farming Experience (years)			
5 – 15	66	27.5	
16 – 26	113	47.1	20±8.5
27 – 37	57	23.8	
38 – 48	04	1.6	
Land area under cultivation (hectares)			
0.5 – 2.0	115	47.9	
2.1 – 3.5	79	32.9	2.7±0.9
3.6 – 5.0	41	17.1	
5.1 – 6.5	5	2.1	
Annual Farm income (₦)			
Below 50,000	33	13.8	
50,000 – 100,000	105	43.8	196,944.68±113,345
101,000 – 150,000	88	36.6	
Above 150,000	14	5.8	
Access to extension services			
Yes	136	56.7	
No	104	43.3	

Source: Field Survey, 2018

### Farmers' Awareness of the farmer-to-farmer extension

Data presented in table 2 shows the level of farmers' awareness of the farmer-to-farmer extension approach in the study area. Awareness is the knowledge of existence of a phenomenon. Awareness is the first step in the adoption process when considering new ideas or technology (Behrens and Evan, 2004). As indicated in Table 2, 42.5% (Sigma score =4.400) of the respondent interviewed had no idea about the farmer-to –farmer extension approach, whereas 57.5% (sigma score =4.876) claimed to understand the meaning of farmer-to-

farmer extension approach. Farmers who claimed to understand this term were asked to explain it. Most of them were correct in their description. In terms of the respondents that were aware of the farmer-to-farmer 82.6% (sigma score =5.560) adopted the approach, while the remaining 17.4% (sigma score = 3.280) did not. Apparently awareness set the stage for the adoption of farmer-to-farmer extension approach among farmers in the study area. Supportably, (Simon et al., 2013) posited that the success or failure of the other stage of the adoption process which include interest, evaluation and trial depends on how the awareness stage is managed.

**Table 2: Awareness and Adoption of Farmer-to-Farmer Extension Approach, N = 240**

Item	Frequency	Percentage	Sigma Score	Remark
<b>Awareness on F2F</b>				
Yes	138	57.5	4.876	Low
No	102	42.5	4.400	Low
<b>Adoption of F2F, n = 138</b>				
Yes	114	82.6	5.560	High
No	24	17.4	3.282	Low
<b>*Sources of Information on F2F, n = 138</b>				
Friends	10	7.2		
Neighbours	44	31.9		
Farmers organization	86	62.3		
Public extension agent	49	35.5		
Mass media				

Source: Field Survey, 2018

### Influence of farmers' socioeconomic characteristics on awareness and adoption

Several variables influence farmers' socioeconomic characteristics on adoption of farmer-to-farmer extension model. Some of these variables are shown in Table 3. Results in the table show that some variables influence adoption positively while some had negative influence on adoption. Variables such as access to credits, education, e-media and access to extension services are significant factors that influence the likelihood of adoption of farmer-to-farmer approach by farmers in the state. The coefficient of education was positively signed and significant at 5%. The expectation is that positive regression coefficient would imply that the higher the education level, the more the likelihood of a farmer to adopt the farmer-to-farmer extension approach. The result further show that access to extension services positively influence the probability of adopting the farmer-to-farmer extension approach at 1% level of significance. The marginal effect indicated access to extension services contributed 67.9% influence to the adoption of the farmer-to-farmer extension approach. By implication, adoption

of the approach among farmers increases with increase in the intensity of extension services offered to farmers. The table further revealed the coefficient of e- media was negatively signed and significant at 1%. This implies that, the probability of adopting the farmer to-farmer approach decreases with farmers who had access to e-media than those that had not. The marginal effect shows that access to e-media decreases the adoption of farmer-to-farmer extension approach by 36.4%.

The Chi square statistics of 61.86 was statistically significant ( $p < 0.01$ ). Thus, the null hypothesis was rejected and the alternative hypothesis accepted, implying that socio-economic characteristics of farmers have influence on their adoption. Furthermore, Pseudo  $R^2$  of 0.1862 implies that the variables included in the model accounted for 18.6% of the factors responsible for the variations in the probability of adoption of the farmer-to-farmer extension model. This means that, there are other factors apart from those captured in the logit model that could have affected the respondents' probability of adoption.

**Table 3: Estimate of Binary Logit Regression Analysis**

Variables	Awareness		Adoption	
	Coefficient ( $\beta$ )	Marginal Effect ( $\beta_m$ )	Coefficient ( $\beta$ )	Marginal Effect ( $\beta_m$ )
Access to credit (dummy)	-1.1945 (-0.217) <sup>NS</sup>	-0.2649 (-1.34) <sup>NS</sup>	-1.3191 (-1.64) <sup>*</sup>	-0.3183 (-1.65) <sup>*</sup>
Education (years)	0.1411 (2.35) <sup>**</sup>	0.0330 (2.41) <sup>**</sup>	0.0909 (1.93) <sup>**</sup>	0.0227 (1.93) <sup>**</sup>
Age (years)	-0.0269 (-0.70) <sup>NS</sup>	-0.0063 (-0.70) <sup>NS</sup>	-0.0277 (-0.76) <sup>NS</sup>	-0.0069 (-0.76) <sup>NS</sup>
Discussion (dummy)	0.6357 (1.75) <sup>*</sup>	0.1526 (1.73) <sup>*</sup>	0.2116 (0.62) <sup>NS</sup>	0.0525 (0.62) <sup>NS</sup>
E-media (dummy)	-0.3929 (-0.63) <sup>NS</sup>	-0.0906 (-0.64) <sup>NS</sup>	-1.5258 (-2.49) <sup>**</sup>	-0.3637 (-2.75) <sup>***</sup>
Farming experience (years)	0.0544 (1.24) <sup>NS</sup>	0.0127 (1.25) <sup>NS</sup>	0.0315 (0.77) <sup>NS</sup>	0.0079 (0.77) <sup>NS</sup>
Farm size (hectares)	1.2012 (3.32) <sup>***</sup>	0.2810 (3.37) <sup>***</sup>	-0.1222 (-0.45) <sup>NS</sup>	-0.0305 (-0.45) <sup>NS</sup>
Access to extension service (dummy)	3.3415 (3.49) <sup>***</sup>	0.6768 (5.17) <sup>***</sup>	3.3982 (3.71) <sup>***</sup>	0.6789 (5.78) <sup>***</sup>
_cons	-5.3157 (-2.60) <sup>***</sup>		-0.3178 (-0.20) <sup>NS</sup>	
Log likelihood	-122.21		-135.21582	
LR $\chi^2$	82.24 <sup>***</sup>		61.86 <sup>***</sup>	
Pseudo $R^2$	0.2518		0.1862	
Number of Obs. = 240				

Source: Field Survey, 2018  
 \*\*\*, \*\* and \* → Coeff. Sig. @ 1%, 5% and 10% respectively. <sup>NS</sup> = Not Significant. Figures in parenthesis are z-values

### Conclusion and Recommendations

Result of the study shows that there was a low awareness by farmers on the model, but a high rate of adoption of farmer to farmer extension model among those who are already aware of it in the study area. Farmers have attested to the fact that social

organization like the cooperatives, and public extension agents had remained the major sources of information. However, Approaches to agricultural extension in Nigeria and other developing nations continue to evolve, farmer-to-farmer extension approach is one of such approach that bridge the gap

created in public extension service. The role of education and access to extension services cannot be overemphasized in influencing the farmers' awareness and subsequent adoption of the farmer-to-farmer extension model. This study therefore recommends the following:

- To increase more participation, farmer with more community social roles should be considered for selection as farmer extension facilitators since they have more chances of interacting with other farmers.
- An important advantage of farmer to farmer extension programme as affirmed by the adopters is that, it often helps to increase farmers' access extension services. Policy makers interested in increasing the proportion of farmers accessing extension services should consider adopting farmer to farmer extension approaches as it is often easier to recruit volunteer farmer trainers than to recruit extension workers.
- Considering the role of education on awareness and subsequent adoption of the farmer-to-farmer extension approach, farmer extension facilitators should be appropriately trained by relevant stakeholders to handle farmers of different status.
- Efforts should be made to increase awareness on farmer-to-farmer extension approach and change the other farmer's mindset as to how the approach is being conducted.

## REFERENCES

- Abdullah, F. A., and Samah, B. A. (2013). Factors impinging farmers use of technology. *Asian Social Science*, 9(3), 120–124. doi:10.5539/ass.v9n3p120
- Adejo, P.E; M.H. and Adejo, S.O. (2012). Indigenous practices and the challenges of climate change among small scale farmers in Dekina Local Government Area of Kogi State, Nigeria. Proceedings of the 17th Annual National Conference of the Agricultural Extension Society of Nigeria (AESON). Held at University of Nigeria, Nsukka, 11-14th March, 2012, pp. 70-77.
- Arokoyo, T. (2011). Effective Extension Delivery, Food Security and its Implications: An Invited Keynote Address Delivered at the 18th Annual South-West REFFILS Workshop. Institute for Agricultural Research and Training Ibadan, February 15-19.
- Bamire, A.S., Fabiyi, Y.L. and Manyong, V.M (2002) Adoption Pattern of Fertilizer Technology among Farmers in the Ecological Zones of South-Western Nigeria: A Tobit analysis. *Austr. J. Agric. Res.* 53:901-910.
- Behrens, J. H. and Evans, J. F., (2004). Using mass media in extension teaching in agricultural extension – A reference manual, second edition, FAO, pp 144.
- Franzel, S., Degrande, A. Kiptot E., Kirui J., Kugonza, J., Preissing, J. and Simpson, B. (2015). Farmer to farmer extension. Note 7. GFRAS good practice notes for extension and advisory services. GFRAS: Lindau, Switzerland.
- Idrisa, Y.I, Ogunbameru, B.O. and Madukwe, M.C.(2012) Logit and tobit analyses of the determinants of likelihood of adoption and extent of adoption of improved soybean seed in Borno State, Nigeria. *Greener Journal of Agricultural Sciences*. 2: 37-45
- KOSEEDS (Kogi State Economic Empowerment and Development Strategy 2004). Towards Poverty Alleviation Wealth Creation. Lokoja, Kogi State Ministry of Budget and Planning. Pp 17.
- Modibo. K., Nthoiwa, G. P., & Tsalaesele, N. (2010). An evaluation of factors that hinder subsistence farmers from diverting to profitable farming in Botswana: A lesson for extension officers. In W. H. Kimaro, L. Mukandiwa, & E. Z. J. Mario (Eds.), in *Towards improving agricultural extension service delivery in the SADC region* (Proceedings of the Workshop on Information Sharing Among Extension Players in the SADC Region, 26-28 July 2010, Dar es Salaam, Tanzania (pp. 12–14).
- Nalukwoago, J. (2004). Efficiency of extension approaches used in dissemination potato technologies in S. Western and Eastern Uganda MSc Thesis Makerere University.
- National Bureau of Statistics (NBS), (2011). Annual Abstract of Statistics, 2011. Federal Republic of Nigeria. Pp 1-20.s
- Nwachukwu, I. (2014). Agricultural Communication, Principles and Practice. LambHouse Publishers, Umuahia, Nigeria. Pp. 1-50.
- Rivera, W.M. and Amanor, D. (1991). World-wide Institutional Evolution and Forces of Change: New York: ELSEVIER. Pp 89-100.
- Simon, B.P., Ndaghu, A.A., Yohanna, I. (2013). Awareness of Sustainable Agricultural Land Management Practices Among Crop Farmers in Northern Part of Taraba State, Nigeria. *ARNP Journal of Science and Technology*, VOL. 3, NO. 5:557-560
- Swanson, B.E. and Samy, M.M. (2002), Developing an Extension Partnership among Public, Private, and Non-government Organizations, *Journal of International Agricultural and Extension Education*, Vol. 9 No 1.