

## **CONSTRAINTS ANALYSIS OF FARMER-TO-FARMER EXTENSION MODEL AMONG SMALL HOLDER FARMERS IN KOGI STATE, NIGERIA**

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### **ABSTRACT**

*The study analyzed constraints of farmer-to-farmer extension model among small holder farmers. The study was conducted in Kogi state, the study was designed to: identify sources of agricultural information, examine farmers' perception of farmer-to-farmer in knowledge transfer and identify the factors constraining the effective of the model. A multi stage random sampling technique was used to select 240 registered farmers as respondents for the study. Primary data was obtained through interview scheduled and questionnaire administration. Data collected was analyzed using frequency count, percentages, mean score from 5 points likert scale and factor analysis were used respectively. The findings revealed that radio (94.2%) as the major source of information among farmers in the state, closely followed by cooperatives and public extension agents/ experts with 91.1% and 81.7% respectively. The study also revealed the mean score of farmers with the opinion that farmer-to-farmer is a friendly approach with a local content (=4.5), farmer-to-farmer as a viable means of knowledge transfer (4.2), the materials needed for educational programmes readily available (2.1). The study further revealed that climatic factor has the highest loading in factor 1 (-803), inadequate access to credit, rural-urban migration and poor health status of the farmers loaded more on factor 2 (-898,-798 and -740) respectively. There's need for government and other relevant stakeholders to provide low cost incentives to address lead farmers' motivation.*

Keywords: Constraints, Farmer-to-Farmer, Extension, Factor analysis

### **INTRODUCTION**

#### **INTRODUCTION**

It is obvious that agriculture still remains the backbone of Nigeria's economy, it accounted for the largest portion of Gross Domestic Product (GDP), before the discovery of oil. Currently, the sector accounts for over 70 percent of the labour (Food and Agriculture Organization, FAO, 2014). Agricultural extension is one of the pillars for development which plays an undisputable role in agricultural and rural development efforts in Nigeria and other developing countries. It serves as the source of information on new technologies for farming communities which when adopted can improve production, incomes and standards of living (Samuel *et al.*, 2012). Moreover, agricultural extension provides a channel through which farmers' problems could be identified for research and formulation of agricultural policies to the benefit of rural communities.

The extension system constitutes a framework through which farmers are organized into functional groups in order to gain access to production resources such as credit, inputs, marketing services and information on government development programmes, Department for International Development (DFID, 2001). This strategy features prominently in developing countries where specialized advice is given on selected enterprises; the participatory approach, where farmers or other beneficiaries identify their own problems and develop their own solutions. This strategy is widely applied by non-government organizations (NGOs) and is a characteristic of the farmer-to-farmer extension service. In this model beneficiaries are fully involved in identifying problems, suggesting solutions and disseminating technologies and practices (Nalukwago, 2004). Following the decline of investments in government extension services, community-based extension approaches have become increasingly important. One such approach is farmer-to-farmer extension (F2FE), which is defined by Franzel *et al.* (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 wide range of practices covering livestock, crops, agroforestry, and fisheries. Roles and responsibilities of farmer-trainers vary but the most frequently mentioned ones include training, monitoring/ following up, advising, conducting demonstrations, organising meetings, and acting as liaison between farmers and development agents.

The declining role of the public extension service created a delivery gap necessitating emergence of an alternative extension service provider (Rivera and Amanor, 1991, Swanson and Samy, 2002). Swanson and Samy (2002) further explain that, with the decline in government expenditures, public extension systems are not able to provide adequate educational and technical extension programmes for all groups of farmers. Furthermore, public extension has been less effective in responding to the basic educational needs of small scale and marginal farmers due to insufficient resources, lack of staff motivation, misappropriation of fund, logistics and the lack of a continuing flow of appropriate technology. Therefore, alternative organisations, especially NGOs, have emerged to fill such gap, with the view of getting useful information to farmers and assisting them to acquire the necessary knowledge, skills and attitude to effectively utilize this information or technology. Despite the awareness of farmer-to-farmer extension model, there are some constraints hindering the effectiveness adoption of the model by farmers such as high level poverty, low level of education, poor health status of the farmers and lack of extension contact.

Looking at the above scenario, the following research questions are therefore asked: what are the sources of agricultural information to farmers/? How do farmers perceive the effectiveness of farmer-to- farmer model in transferring knowledge? And what are the factor constraining the effectiveness of the farmer-to-farmer extension model? It is in view of the mentioned research questions that this study was designed to analyze the constraining factors of farmer-to –farmer extension model among small holder farmers in Kogi State, Nigeria. The study was designed to; identify the sources of agricultural information to farmers; examine farmer’s perception of the farmer-to-farmer extension model in knowledge transfer; identify factors constraining the effectiveness of the farmer-to-farmer extension model.

### **METHODOLOGY**

The study area is Kogi State, Nigeria. Kogi State was created on 27<sup>th</sup> August, 1991 out of Kwara and Benue States. 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. The distance from Lokoja to the Federal Capital Territory, Abuja is approximately 193 kilometres (National Bureau of Statistics, NBS 2011). Kogi State has three 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 by Ebirá people; while the Western senatorial district is inhabited by the Yoruba people. Minor tribes found in the State include: Bassa-Nge, Bassa-Komu, Nupe, Kupa, Kankanda, Ogori-Mangogo, Idoma, Eggan, and Gwari. The State consists of 21 Local Government Areas. The State is located between latitude 6<sup>o</sup>30'N and 8<sup>o</sup>5'N and longitude 5<sup>o</sup>51'E and 8<sup>o</sup>00'E.

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 well endowed with river valleys and swamp 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 potato, beniseed, melon, banana, plantain and cotton. Fruits and leafy vegetables such as okra, pepper, fluted pumpkin and spinach are also cultivated in the area.

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 was analyzed using both descriptive and inferential statistical tools. Frequency count, percentage, mean score from 5-point likert scale and factor analysis were used.

## RESULTS AND DISCUSSION

### Sources of agricultural information of respondents

Information source is an institution or individual that creates or brings about a message (Statrasts, 2004). The result presented in Table 1 shows radio (94.2%) as the major source of information among farmers in the State. This was closely followed by cooperatives and public extension agents/experts with 91.7% and 81.7% respectively. The role of radio and television as source of agricultural information cannot be overemphasized as it can convey messages in farmers' local dialect. This finding on radio as a major source of agricultural information agrees with Adejoh (2014) who reported that majority (85.63%) of rural farmers in Kogi State preferred to seek their agro-information from radio. This finding further supports an earlier study by Adejo *et al.*, (2010) when they said that radio is the most popular ICT facility especially in rural communities because it is considerably cheap to buy and communicates useful agricultural messages to a large number of people at relatively low cost and faster rates. The finding further agree with Daudu *et al* (2013) when they reported public extension agents as major source of obtaining agricultural information among farmers in Nigeria. The fining of this study further corroborates Okunlola (2003) who reported that farmers obtained information on improved practice mainly through extension agents and radio. Yahaya and Aina (2007) found that most of the cassava farmers (97%) have access to information from extension agents. Okoosi (1990) also opined that extension agencies rely on the use of both electronic and print media to disseminate information to its target audience. Arokoyo (2003) had observed that, radio and TV has been the main tools used in agricultural extension delivery in Nigeria. Input suppliers, trained farmers, printed materials, marketers, farmers farming gangs, neighbours and friends, and family/relatives were some noticeable source of agricultural information identified by farmers in the State. Similarly, Bozi and Ozcatalbas (2010) revealed that family members, neighbor farmer, extension services, input providers and mass media were key sources of information for Turkish farmers.

Fellow farmers give their colleague information on various rice production practices such as time of planting, plant spacing, use of improved varieties and other innovative practices. This finding also agrees with Yahaya (2001) who reported that farmers usually get agricultural information on improved technologies from their fellow farmers. Habtemariam *et al.*, (2015), reported that rural farmers transfer their knowledge to their neighbours, friends, relatives and children mainly through informal discussion, experience sharing and inviting other farmers to visit their own farms.

**Table 1: Distribution of Respondents According to Sources of Information on Agricultural Production, n = 240**

<b>Source</b>	<b>Frequency*</b>	<b>Percentage</b>
Radio	226	94.2
Cooperatives	220	91.7
Public extension agents/experts	196	81.7
Input suppliers	188	78.3
Trained farmers	110	45.8
Printed materials	95	39.6
Marketers	85	35.4
Farmer farming gangs	83	34.6
Neighbours and friends	83	34.6
Family/relatives	78	32.5
Elders	60	25.0
Nutrition experts/dieticians	31	12.9
Television	25	10.4
Agricultural research centres	25	10.4
Universities and other tertiary Institutions	19	7.9
Conference and meetings	15	6.3
Private extension agents/experts	11	4.6
Mobil phones	10	4.2
Health extension workers	7	2.9

**Source:** Field Survey, 2018

\*= multiple responses

### **Farmers' perception on the model in knowledge transfer**

The mean score of farmers' perceptions and views about the farmer-to-farmer extension approach as being a friendly approach with local content was rated highest with 4.5. The respondents further perceived the farmer-to-farmer extension approach as being viable in knowledge transfer and providing useful information with mean score of 4.2 and 4.1 respectively. Specifically, the farmers strongly agreed (mean score = 4.1) to the fact that, the farmer-to-farmer extension approach provided useful information that translated to improved crop than livestock production. Closely followed was the perception that, the farmer-to-farmer extension approach helped farmers to improve livestock production than crop. Moreover, the farmers generally agreed that, the farmer-to-farmer extension approach provided useful information in improving both crop and livestock production. Furthermore, the mean score of the farmer's perceptions of the farmer-to-farmer agents' preparedness for the training programmes was also rated 3.0.

The finding of this study is in line with established literature which situated that, for any extension model to be deemed effective it should be able to improve production and productivity (Rivera and Carry, 1998), and at the same time be readily available and accessible (Chambers, 1990). The finding further underscored an earlier report by Garforth (2011) who noted that, globally, most research on farmers' access to information and advice on new technology points to "other farmers" within the locality as their most proximate source, particularly at the point of decision about whether to make a change in their food production system. This reality affirms the theory of diffusion of innovations developed by Everett Rogers (Rogers, 2003) and is the main reason for the successful use of the farmer-to-farmer or lead farmer approach. Apparently, the farmer-to-farmer extension approach is characterized with various benefits; provide a focal point in the community for introducing new technologies, for building farmer capacity, and as an entry point for service providers, such as input suppliers. Farmer trainers also help increase farmers' networking and linkages in the communities and enhance the exchange of knowledge and sharing of experiences for increasing agricultural production. Lead farmers help in changing attitudes of the farmers, who motivate and encourage one another in adopting technologies. Because of trust, closeness and shared common attributes, farmers tend to be inclined to learn from fellow farmers. Lead farmers also serve as an entry point for other development initiatives (Mulwafu and Krishnankutty, 2012). As shown in Table 2, most (*mean score* = 2.3) of the farmers interviewed disagreed with the statement that, the farmer-to-farmer extension practice is a common approach among farmers in the State. This result is not surprising as 42.5% of the respondents were not aware of the farmer-to-farmer extension approach.

**Table 2: Distribution of Respondents on their Perception of the Farmer-to-Farmer Extension Model in Knowledge Transfer n = 138**

<b>Perception</b>	<b>SA</b>	<b>A</b>	<b>U</b>	<b>D</b>	<b>SD</b>	<b>Mean Score</b>
The farmer-to-farmer extension provides useful information that helped me in improving my crop yield than livestock production	47	70	7	17	0	4.1
The farmer-to-farmer extension provides useful information that helped me in improving my livestock production than crop	15	66	51	6	0	3.7
The farmer-to-farmer extension provides useful information that helped me in improving both crops and livestock production	26	35	45	15	17	3.3
I understand farmer-to-farmer extension as viable means of knowledge transfer	58	54	19	5	2	4.2
The farmer-to-farmer extension is a common practice among farmers	10	5	33	58	32	2.3
The training or education programmes are provided regularly	17	5	11	52	53	2.1
The farmer-to-farmer agent is usually well prepared during visit and education programmes	10	8	102	11	7	3.0
The materials needed for educational programmes are readily available	5	7	2	107	12	2.1
The farmer-to-farmer extension is a friendly approach with local content	87	33	18	0	0	4.5
The information provided are very useful	57	56	15	5	0	4.1

**Source:** Field Survey, 2018, NOTE; SA=Strongly Agreed, A=Agreed, U=Undecided, D=Disagree, SD=Strongly Disagreed.

### **Constraining factors to effectiveness of the farmer-to-farmer extension**

Specific items that loaded more on factor 1 are; climatic factor, inadequate time and financial resources, low level of education, and unavailability of land. Climatic factor has the highest loading in factor 1, hence, the variables were termed climatic and personal factor. This finding underscores the prevailing effect of climate change in agricultural production. Farming activities in the State are rain fed; hence, most of the operations are affected by the vagaries effect of weather and climate. The farmer-to-farmer extension approach is cost intensive. In the same vein, Nalukwago (2004), carried out a study in south western Uganda and revealed that the farmer-to-farmer extension model had the highest cost per farmer trained compared to other extension approaches like T&V but had the highest benefit: cost ratio compared to other approaches. Also, Farmer-trainers require compensation for their time and effort. The finding on financial resources further agrees with Amanuel (2007), who reported that, many farmers in Ethiopia are constrained with resource limitations, apparently not able to take risks and carry out experiment with their meager resources although natural tendency and talent to try new things is a certain factor to innovate, such talents may remain dormant if resources and enabling environment are not theirs.

Inadequate access to credit facilities, rural-urban migration, logistic support, and poor health status of farmers loaded more on factor 2. The problem of credit access was rightly addressed under component 1. The finding on logistic support corroborates an earlier finding by Hakiza *et al.* (2004), when they reported logistic issues as a major constraint to the farmer-to-farmer extension approach. They gave examples of such support to include; location of the FFS, synchronization of the Farmer-Field-School with planting season, maintenance of a full schedule for each Farmer-Field-School meeting, location of the study fields relative to the Farmer-Field-School meeting place, control over the study fields, relationship of the Farmer-Field-School to local needs, inadequate material and / or late arrival of funds and unforeseen interruptions due to other occurrences in the locality of training like sicknesses, death and traditional functions.

Old age of farmers, poor health status, and lack of extension are the personal factors that loaded on factor 3. The farmer-to-farmer extension approach requires energy and healthy farmer to take the lead in knowledge transfer. The farmers who are village extensionists usually do the extension of technologies. As a community-based approach, Farmer-to-Farmer extension systems encourage full community participation and represent a farmer centered extension approach. The finding on extension contact further did not come as a surprise as the farmer-to-farmer extension approach did not literally replace the formal public extension service delivery. Apparently, it is aimed to complement extension provision to rural farmers, especially those in remote areas.



As a participatory model of extension, Farmer-to-Farmer extension can help to address the needs and demands of disadvantaged groups, and to empower communities (GFRAS, 2015).

Extension agents' attitudes, farmers' acceptability, high poverty level, and corruption loaded on factor 4 – Institutional factors. This finding underscores the role of public Institutions such as extension outfit under the auspices of the Kogi ADP, government parastatals and/or establishments saddled with poverty related issues and corruption in the agricultural production process. According to Akinngbe and Ajayi (2010), it is not easy for farmers to get accepted by fellow farmers and the community in general. No one expects poor farmers to be sources of innovation that may change the lives of others too. Many people have the tendency to believe that is only literate and intelligent people (like extension workers, who could bring something new and important to the farmers. They further pointed out that, identification of innovative farmers is not an easy task form; it requires a different approach than the traditional survey method. It also requires time, patience and commitment.

**Table 3: Factor Analysis on Constraints to the Effectiveness of the Farmer-to-Farmer Extension Approach**

Factors	Component			
	1	2	3	4
Climatic Factor	-.803			
Inadequate time and financial resources	.769			
Low level of education	.740			
Unavailability of land	.732			
Inadequate access to credit facilities		.898		
Rural-urban migration	.477	-.798		
Logistic support		.431		
Old age of farmers			.740	
Poor health status of farmers		-.537	.604	
Lack of extension contact			.532	
Lack of government support				
Extension agents attitude				.724
Farmers' acceptability			-.620	.651
High poverty level			.408	-.644
Corruption				.535

**Source:** Field Survey, 2018; Component 1 = Climatic and Personal Factor; Component 2 = Financial Factor; Component 3 = Personal Factor, Component 4 = Institutional Factor  
**Extraction Method:** Principal Component Analysis. **Rotation Method:** Varimax with Kaiser Normalization (loading at 0.40 and above).

## CONCLUSION AND RECOMMENDATIONS

The modern trend in extension services involves agricultural technologies in order to improve farmers' performance. The limited adoption rate is traced back to the fact that the specific needs of the farmers are not addressed. The study shows that sources of agricultural information played a vital role in dissemination of useful information to farmers. Despite the various sources of agricultural information channels used the level of adoption of farmer-to-farmer extension model, several factors still constrained its effectiveness and diffusions such as high level of poverty, low level of education and low extension contacts.

The study therefore recommends the following:

1. To instill more confidence and attitude/perception of other farmers in the farmer-to-farmer extension approach, communities should be involved in the selection of farmer extension facilitators to ensure accountability of the farmer extension facilitators.
2. Considering the rating of financial resources as a constraining factor to the effectiveness of the farmer-to-farmer extension approach, there is need for government and other relevant stakeholders to provide low-cost incentives to address lead farmers' motivations. Helping farmers earn cash from associated activities is also important.
3. Linking lead farmers to more permanent structures, such as government extension services, farmer organizations or private companies can help ensure that they have continued support and access to new information, thus making extension systems more effective and farmer-to-farmer extension systems more sustainable.

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