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Perceived Effectiveness of Agricultural Extension Methods Used to Disseminate Improved Technologies to Rice Farmers in Kogi State, Nigeria

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Abstract

The study assessed the perceived effectiveness of agricultural extension methods used to disseminate improved technologies to rice farmers in kogi state, Nigeria. The specific objectives were to describe the socio – economic characteristics of the rice farmers, to assessed farmers level of contact with extension agents, perceived level of competence of extension agents to perform agricultural extension activities and farmers perception on the effectiveness of agricultural extension methods in the study area. Primary and secondary data were used for the study. Data were collected using a well-structured questionnaire from 212 rice farmers in the study area. The data collected were analyzed using descriptive statistics. Results showed that 59.9% of the respondents were male, with a mean age of 43.5 years. Majorities (58%) of the respondents were married and about 44.3% of them had more than 20 years of farming experience. About 99.1% of the farmers were aware of the existence of extension agents in their area and 87.7% were visited fortnightly. Also, extension agents were perceived to be more competent in performing field demonstration activities and the individual contact method was perceived as the most effective extension teaching method in the study area. It is recommended that the extension agents should do more in contacting more female rice farmers as well as male rice farmers; the extension agents should use variety of extension methods appropriately in order to meet specific extension objectives and to ensure effective use of limited resources, personnel, time and fund which ensure farmers participation, more farmers will be reached and all gender categories will be catered for.

Keywords: Perceived, Effectiveness, Extension Methods, Rice Farmers

1. Introduction

Agriculture continues to remain a major driver of economic growth in Nigeria. Agriculture accounts for over 70 percent of the active labor force, and more than 23 percent of the Gross Domestic Product in Nigeria (World Bank, 2007). Agriculture remains the bedrock of Nigeria's economic and nutritional development with an estimated 70% of the country's over 140 million populace living in rural areas and engaging in agricultural–related activities (Farobode and Laogun, 2008; Koyenikan, 2008; and Chiadidi, 2009). Thus, agriculture provides employment for a large percentage of the nation's population, food for the populace and raw materials for agro- based industries. However, despite the involvement of large percentage of the population in agriculture, the country continues to spend the lean foreign reserve on importation of food. The perpetual food shortage is often blamed on ineffective agricultural research, lack of continuity in agricultural policies and programmes, poor implementation by administrators, low quality of extension and poor linkage system between research, extension and farmers (Adesoji and Aratunde, 2012).

However, the role of public agricultural extension service has traditionally being to provide the important link between agricultural researches and farming communities, especially for technology transfer in support of agriculture and rural development. However, strong criticism of public agricultural extension services has circulated in recent years FAO, (2004). According to (Qamar, 2002) this criticism is due to its top-down approach, which has been supply-driven, technically weak, catering only for large farmers (progressive farmers) and providing insufficient coverage of the small-scale farmers, who are the producers of the bulk of food crops in Nigeria. This implied that proven agricultural technologies which are needed to ensure higher productivity and food security, do not reach the millions of small-scale farmers scattered in the rural areas. Consequently, these farmers have managed to obtain information from sources such as other farmers, inputs dealers, produce buyers and NGOs Agbelemoge, (2009).

Rice (Oriza spp) is an important staple crop in Nigeria. Over the years, the crop has witnessed a steady increase in demand and its growing importance is evident given its important place in the strategic food security planning of Nigeria (Shehu, 2010). The demand for rice in Nigeria is growing faster than for any other major staple food with consumption broadening across all socio-economic classes including the poor. Rice is one of the most widely and commonly consumed staples. On the average, Nigerian consumes 24.8 kg of rice per year, representing 9% of total caloric intake (Wudiri and Fatoba, 1991). Substitution of rice for coarse grains and traditional roots and tubers has fuelled growth in demand at an annual rate of 5% between 1961 and 1992 (Osiname, 2001).

Agricultural extension brings about changes, through education and communication in farmers attitude, knowledge and skills. The role of agricultural extension involves dissemination of information; building capacity of farmers through the use of a variety of communication methods and help farmers make informed decisions. Sinkaiye, (2005) equates help in extension to empowering all members of the farm households to ensure holistic development.

The Nigerian extension service is bedeviled by several problems as identified by Agbamu (2005). These include inadequacy and instability of funding, poor logistic support for field staff, use of poorly trained personnel at local level, ineffective agricultural research extension linkages, insufficient and inappropriate agricultural technologies for farmers, disproportionate Extension Agent: Farm Family ratio and lack of clientele participation in program development. Others are poor input supply, irregular evaluation of extension programmes and policy, institutional and programme instabilities of National agricultural extension systems. Some of the recommendations to improve the service are to make its content more relevant to farmers, alternative sustainable financing option, well trained, and adequate staffing, and the use of participatory extension approach under stable policy and sustainable institutional arrangement.

A number of studies have shown the relative importance which extension staff attach to the use of extension methods. In one of the studies, Pandy (1998) asked a group of 92 staff members of the Western Nigeria Ministry of Agriculture how they distribute their time among the various methods. In response, 52 of them said they often held extension meetings, 25 said they often carried out demonstration of new farm practices, while 39 reported that they conducted demonstrations occasionally and 28 of them never carried out demonstration. Twenty one of the respondents often used posters to show new practices, 59 said that farmers called to them to seek advice. 31 often took farmers on tours, while 18 often gave out pamphlets and bulletins.

Similarly, Obibuaku and Hursh (1994) studied the effects of radio, demonstrations, personal contact with extensions staff, films, lectures, newsletters, pamphlets on farm practices, adoption in the East Central State of Nigeria. The results showed that the radio and agricultural demonstrations were the means most used in reaching the farmers. The significant of the two methods may be related to the fact that the majority of the farmers were illiterate and thus responded more to those methods which emphasized seeing and hearing in contrast to those methods which emphasized reading.

Also Tenebe and Mundi (2008) carried out a research on comparative study of direct extension teaching methods (DET) and Open and Distance Learning (ODL) on technology adoption rate by cowpea farmers in Bauchi State of Nigeria. The DET methods used included contact lectures/seminars, workshop, field demonstration and on-farm trials while ODL methods included the use of print materials (pamphlets, posters and bulletins), radio and television. The study revealed that the use of radio as a method of ODL is more effective than DET method and therefore recommended for successful technology adoption by cowpea farmers in Bauchi State of Nigeria. The study also attempted to determine the effects of the various methods in helping to bring about improvements on the farm. From the study, the researchers concluded, the results of this study indicate that in teaching farmers with

little or no education, extension workers should be selective in the methods they use. Very little use can be made of pamphlets, bulletins, circular letters and the like. However, where the farmers are literate, extension written materials can make valuable contributions because of the specific nature of their message and the fact that they are available for easy reference. From these and similar studies, it can be seen that extension workers in Nigeria are not making adequate use of extension methods in their work. For example, 28 out of 92, or 30.43% of the extension staff in Western Nigeria never used demonstrations in their teaching. It is therefore necessary for all extension staff to understand the classification and usefulness of various extension methods. It is in the light of this that the study seeks to assess farmer's perception of extension methods used to disseminate improved technologies to rice farmers in the study area. Specific objectives of the study are to identify the socio – economic characteristics of the rice farmers; assess farmer's level of contact with extension agents; farmers level of perceived competence of the extension agents to perform extension services and to assess farmer's perception on the effectiveness of extension teaching methods.

2. Materials and methods

This study was undertaken in Kogi State of Nigeria with focus on appraisal of agricultural extension activities and methods used to disseminate improved technologies to rice farmers in the state. The state is in the north central zone of the country and popularly called the confluence state because River Niger and River Benue meets there. The State lies on latitude 49°71'North and longitude 45°61'East with a geological feature depicting young sedimentary rocks and alluvium along the riverbeds, which promotes agricultural activities and has an average maximum temperature of 33.2 °C and average minimum of 22.8 °C.

The State climate oscillates between the wet and dry seasons with a daily temperature of between 24°C - 27°C, while annual mean rainfall is between 1250 – 1700 mm. The vegetation is mixed savannah and forest types. The State has an average of 172,000 farm families; about 70% of this population live in the rural areas and engage in crop production and animal husbandry. The study was carried out in Idah, Ibaji, and Lokoja and Kogi Local Government Areas (LGAs) of Kogi State.

The study made use of primary and secondary data. The Primary data were obtained through the use of questionnaire administered to the respondents, with the aid of well-trained enumerators. A 5 – stage sampling technique was used. Kogi state has 21 local governments. The first stage involves the listing of all major rice producing local governments. The second stage involves random selection of four rice producing local governments. These include Lokoja, Kogi, Idah and Ibaji local government. Third stage involves listing of rice producing villages in each of the local government selected. The fourth stage involves random selection of two rice producing villages from each of the local government selected. The fifth stage involves a random selection of twenty eight (28) rice farmers from each of the selected villages, giving a total of (28×4×2) =224 respondents for the study but only 212 of the questionnaire were returned. The rating of the agricultural extension activities and the extension agents competence in carrying out those activities was done by using a 5 – point Likert type scale of Not competent, little competence, moderately competent, fairly competent and very competent which were assigned a nominal values of 1,2,3,4 and 5 respectively. The extension agents level of competence was determined by calculating the mean for each of the activities rendered to the farmers.

The rating of the various extension methods used was done by using a 4 point Likert type scale of Very Ineffective, Ineffective, Effective and Very Effective which were assigned a nominal point or scores of 1, 2, 3 and 4 respectively. The ranking of different extension methods was done on the basis of their weighted scores, calculated by multiplying the frequency of responses from each of the four (4) columns of a specific method by the nominal scores/point assigned to that column.

3. Results and discussion

Table 1 presents the socio – economic characteristics of the rice farmers in the study area. Agricultural extension services require the participation of different age groups that posses the energy to carry out agricultural extension activities. As shown in table 1, most (30.7%) of the respondents were within the age range of 40 – 49 years, 24.5% were within 30 – 39 years, 23.6% were within 50 – 59 years. While only 1.9% were within the age bracket of 70 – 79 years. The mean age of the respondents is 43.5 years, which means that the respondents were more of youths and in their productive age. This is in line with the findings of Agbelemoge et al (2013) who reported that Majority (61.9%) of sampled respondents were between the ages of 41 and 60 years. The mean age of the crop farmers was 47 years and at this age they were considered highly productive and active to undertake the strenuous tasks associated with farm work. Table 1 also reveals that majority (59.9%) of the respondents were male, while 40.1% were female. This implies that more male were reached than

female by the agricultural extension agents. It can also be inferred that they were more male than female involved in rice farming. The finding conformed to Adewoye (2003) who declared that women have been neglected in agricultural extension activities. Opaluwa (2014) reported that 89.5% of farmers in Kogi were males. This is also in line with Ekunwe, Orewa and Emokaro (2008) who report that male farmers dominate yam production production in Edo and Kogi state. Therefore, there is a need for gender mainstreaming within the context of agricultural development programmes. Adegeye and Dittoh, (1985) declared that small scale farmers could only be successful if they were married especially when they had to rely on family labour. Table 1 shows that most (58%) of the respondents were married, 24.1% were single which indicates that they were youths and still have the energy to work on the farm without hiring labour, 10.4% were widowed and 7.5% were divorced at the time of this study. As shown in table 1 most (53.3%) of the respondents had secondary education, 30.2% had tertiary education, 8% had primary education and 1.9% had Quranic education. About 6.6% of the respondents had no formal education. These results are similar to Ajayi and Gunn (2009) who reported that 43% of respondents had up to secondary education and the rest had only Quranic education. Usually low literacy level does not allow the farmers to appreciate innovations in agricultural development in any given society as level of formal education attained by an individual goes a long way in shaping his personality, attitude to life and adoption of new and improved practices (Sullumbe, 2004). This is also in tandem with Hormik (1999) who asserts that basic education whether obtained in school or out of school makes a lot of contribution to farm productivity, as better educated farmers are easier to deal with and have greater access to external agro – information sources and are prone to adopt farm innovations as quickly as possible. Table 1 further revealed that most (44.3%) of the respondents had more than 20 years of experience in rice farming, 15.6% had between 11 – 15 year of experience, 14.6% had between 6 – 10 years of experience, 14.2% had between 16 – 20 years of experience and 11.3% had between 1 – 5 years of experience. This could have an effect on agricultural extension teaching and learning, since some experience farmers tend to depend more on their past experiences. This is in consonance with Iwuchukwu, Agwu and Ajibo (2013) who reported that majority (36.5%) of the farmers in Enugu state had between 21 – 30 years of farming experience, and long years of farming experience could serve as an advantage for increase in output I various farming and related activities when meaningfully deployed.

Table 1. Socio – economic characteristics of the respondents

Variable	Frequency	Percentage	Mean
Gender			
Male	127	59.9	
Female	85	40.1	
Age (Years)			
10 – 19	4	1.9	43.5
20 – 29	23	10.8	
30 – 39	52	24.5	
40 – 49	65	30.7	
50 – 59	50	23.6	
60 – 69	15	7.1	
70 – 79	3	1.4	
Marital Status			
Single	51	24.1	
Married	123	58.0	
Divorced	16	7.5	
Widowed	22	10.4	
Educational Level			
Primary Education	17	8.0	
Secondary Education	113	53.3	
Academic Education	64	30.2	
Quranic Education	4	1.9	
Farming Experience			
1 – 5	24	11.3	
6 – 10	31	14.6	10.92
11 – 15	33	15.6	
16 – 20	30	14.2	
>20	94	44.3	

Table 2. Distribution of the respondents according to their contact with extension agents

Variables	Frequency	Percentage
Are you aware of extension agent in your area?		
No	2	0.9
Yes	210	99.1
Do they visit you?		
No	2	0.9
Yes	210	99.1
How often do they visit you?		
Daily	11	5.2
Weekly	8	3.8
Fortnightly	186	87.7
Monthly	5	2.4
No response	2	0.9
How many times do they visit you in the last cropping season?		
1 – 5 times	52	24.5
6 – 10 times	133	62.7
11 – 15 times	27	12.7
>15 times	--	--

Table3. Reasons for extension agents contact with the Rice farmers

Variables	Frequency	Percentage
Purpose of extension visits		
Teach you improved techniques	175	82.5
Advice you	123	58
To see progress made on your farm	28	13.2
Others	3	1.4
No response	2	0.9
Where do they visit you?		
Home	29	13.7
Farm	176	83
Market	1	0.5
Place of worship	2	0.9
Others	2	0.9
No response	2	0.9

Table 2 shows that majority (99.1%) of the respondents were aware of the existence of agricultural extension agents in their area and also revealed that the extension agents do visit them. Only 0.9% of the respondents claimed not to be aware of the existence of the extension agents in their area and that they were not visited by the extension agents, this may be as a result of the topography of their area especially those living on island, and on or behind mountains.

The table also indicated that majority (87.7%) of the respondents were visited by the extension agents fortnightly, 5.2% daily, 3.8% were visited weekly, 2.4 were visited monthly.

Table 3 revealed that majority (62.7%) of the respondents were visited 6-10 times by the extension agents, 24.5% were visited 1–5 times, 12.7% were visited 11–15 times, while none of the respondents were visited more than 15 times in the last cropping season. The average number of extension visit in the last cropping season was 8 times. From the foregoing, we can infer that the extension agents in the study area used the T & V system of agricultural extension to disseminate useful information to the respondents. This is in agreement with Hossein et al (2009) who reported that, in spite of the rapid improvement in information and communication brought about in recent times, by science and technology, most of the extension workers in Nigeria in particular, still rely on the T and V system. Majority of the population in the developing world live in rural areas and has little or no access to agricultural information.

Also table 3 also show that majority (82.5%) of the respondents were visited by the extension agents to teach/train them on improved practices, 58% said the extension agents visit them for advisory services, 13.2% said to see the progress made on their

farm and to know what constitutes their problem while 1.4% said they are other reasons for extension visitation, which were not disclosed. Table 3 further indicates that majority (83%) of the respondents were visited on their farm, 13.7% were visited at home, 1.8% in the market, while 0.5% were visited in other places. Table 4 shows the distribution of the respondents by their perceptions on the competence of the agricultural extension agents in performing or rendering the extension services. Results from the table shows that field demonstration ranked first with an average mean of 4.28 which implies that the extension agents were fairly competent in performing these activities on the 5 point likert type competence scale. The result revealed that the extension agents were more competent in carrying out the field demonstration activities than other services rendered to the farmers. Advisory services/transfer of technology ranked 2nd with a mean of 4.10, training ranked 3rd with a mean of 4.06 followed by the extension agents act of helping farmers to prepare farm plan which ranked 4th with a mean score of 3.94 while helping farmers to keep farm records, linking farmers to market and helping them source for credit ranked 5th, 6th and 7th with mean scores of 3.50, 3.35 and 2.29 respectively. On the 5 point scale, the implication of this is that the extension agents are moderately competent in helping the farmers to keep farm records, linking them with markets and have little competence in helping farmers source for credit. Furthermore, from the field demonstration activities, the table revealed that the extension agents were more competent in land preparation with a mean score of 4.41 than the other field demonstration activities, followed by sowing and fertilization, both with a mean score of 4.37, transplanting (4.36), seed selection (4.34), nursery maintenance (4.33), weeding (4.21), and pest and disease which ranked least among the field demonstration activities with a mean score of 4.11. Table 5 shows the distribution of the respondents by their perceptions on the effectiveness of the various extension methods used to disseminate improved agricultural technologies by the extension agents. Results from the table shows that on the average, individual method ranked 1st with a grand mean of 2.45 followed by group method (2.39) and mass media (2.37). This revealed that the individual method and the group method of teaching farmers are more effective than the mass media method in the study area. This may be as a result of the fact that these methods give farmers opportunity to be an active participant during teaching and learning process as they allow for sharing and exchange of information between the agents and the farmers.

On the overall, table 5 further revealed that result demonstration was perceived by the farmers as the most effective and ranked 1st with a mean score of 3.86. Extension methods like demonstration plots, seed multiplication programme and field days etc., are some of the major weapons for introducing the findings of modern research in agricultural practices to increase agricultural production in particular and uplift of the rural masses in general (Afzal 1995). This is followed by radio with a mean score of 3.47, and method demonstration with a mean score of 3.36. Training (3.06), farm and home visit (2.91) and audio – visual aids were ranked 4th, 5th and 6th position respectively. Group discussion (2.66), farmers organization (2.03), Television (1.91) and general meeting (1.79) were also ranked 7th, 8th, 9th, and 10th position respectively while telephone calls (1.56), office calls (1.47), contact farmers (1.43) and publications (1.33) were ranked 11th, 12th, 13th, and 14th position respectively.

Table 4. Distribution of the respondents by their perception on Agricultural Extension Activities

Variables	NC(1)	LC(2)	MC(3)	FC(4)	VC(5)	MEAN	RANK
A .Transfer of technology	4(1.9)	20(9.4)	20(9.4)	75(35.4)	93(43.9)	4.10	2
B. Training	3(1.4)	0	51(24.1)	86(40.6)	72(34)	4.06	3
C. Helping to prepare farm plan	3(1.4)	16(7.5)	48(22.6)	68(32.1)	77(36.3)	3.94	4
D. Linkage with market	9(4.2)	53(25)	50(23.6)	55(25.9)	45(21.2)	3.35	6
E. Helping you source for credit/other inputs	72(34)	68(32.1)	28(13.2)	27(12.7)	17(8)	2.29	7
F. Help in keeping farm records	4(1.9)	11(5.2)	102(48.1)	64(30.2)	31(14.6)	3.50	5
G. Field Demonstration:							1
1. Land Preparation	0	4(1.9)	14(6.6)	85(40.1)	109(51.4)	4.41	I
2. Selection of Seed	0	4(1.9)	27(12.7)	73(34.4)	108(50.9)	4.34	V
3. Weeding	0	5(2.4)	30(14.2)	93(43.9)	84(39.6)	4.21	VII
4. Transplanting	0	10(4.7)	27(12.7)	51(24.1)	124(58.5)	4.36	IV
5. Sowing	0	5(2.4)	30(14.2)	58(27.4)	119(56.1)	4.37	II
6. Nursery maintenance	2(0.9)	8(3.8)	24(11.3)	61(28.8)	117(55.2)	4.33	VI
7. Water management	1(0.5)	26(12.)	24(11.3)	66(31.1)	95(44.8)	4.08	IX
8. Fertilization	0	6(2.8)	33(15.6)	49(23.1)	124(58.5)	4.37	II
9. Pest and disease control	6(2.8)	19(9)	28(13.2)	51(24.1)	108(50.9)	4.11	VIII

Legend: NC = Not Competent, LC = Little Competence, MC = Moderately Competent, FC = Fairly Competent and VC = Very Competent

Table 5. Distribution of the respondents by their perception on the effectiveness of extension methods

EXTENSION METHOD	VE	E	I	VI	MEAN	RANK
(a) Mass Media						
Publications	4(1.9)	4(1.9)	50(23.6)	154(72.6)	1.33	14th
Radio	138(65.1)	54(25.5)	1(0.5)	19(9)	3.47	2nd
TV	13(6.1)	75(35.4)	3(1.4)	121(57.1)	1.91	9th
Audio-Visual Aids	37(17.5)	133(62.7)	0	42(19.8)	2.78	6th
(b) Group						
Contact farmers	24(11.3)	8(3.8)	4(1.9)	176(83)	1.43	13th
Training/Seminar	81(38.2)	97(45.8)	0	34(16)	3.06	4th
Method Demonstrations	124(58.5)	64(30.2)	0	24(11.3)	3.36	3rd
General Meetings	28(13.2)	26(12.3)	32(15.1)	126(59.4)	1.79	10th
Group Discussions	71(33.5)	56(26.4)	26(12.3)	59(27.8)	2.66	7th
Farmers Organizations	29(13.7)	52(24.5)	28(13.2)	103(48.6)	2.03	8th
(c) Individual						
Result Demonstration	189(89.2)	19(9)	2(0.9)	2(0.9)	3.86	1st
Telephone Calls	4(1.9)	12(5.7)	83(39.2)	113(53.3)	1.56	11th
Farm /Personal Visits	27(12.7)	161(75.9)	2(0.9)	22(10.4)	2.91	5th
Office Calls	7(3.3)	17(8)	44(20.8)	144(67.9)	1.47	12th

Legend: VE = Very Effective, E = Effective, I = Ineffective, VI = Very Ineffective

4. Conclusion and recommendations

Based on the findings of this study it can be concluded that most of the rice farmers in the study area were youths, in their active labour force and are capable of taking risk, undertaking vigorous activities and are open to new ideas. Majority of the rice farmers in the study area were averagely educated married men who have been in rice farming for a long time with several years of farming experience. The rice farmers were aware of the existence of extension agents in their area and were visited fortnightly on the farm to teach them improved practices; this implies that the training and visit system of agricultural extension has been adopted in the area. The extension agents were more competent in performing the field demonstration activities than the other agricultural extension services rendered to the rice farmers. The individual contact method (Result Demonstration) is the most effective agricultural extension teaching method used in the study area.

Based on the findings of this study, the following recommendations are made: Both government organization and non - governmental organization should provide appropriate technical and management related information to all farmers through continued improvements in extension and other support services. The extension agents should do more in contacting more female rice farmers as well as male rice farmers. The extension agents should use variety of extension methods appropriately in order to meet specific extension objectives and to ensure effective use of limited resources, personnel, time and fund which ensure farmers participation, more farmers will be reached and all gender categories will be catered for. The extension agents should go beyond technology transfer to developing skills and knowledge of farm families for sustainable agricultural and rural development. Funds should be made available and timely for the extension institutions to carry out their extension activities and to remobilize extension agents for more effective extension work.

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