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Effectiveness of radio-agricultural farmer programme in technology transfer among rural farmers in Imo State, Nigeria

Njoku, J. I. K.

Department of Agricultural Extension and Rural Development, Michael Okpara University of Agriculture, Umudike, Abia State, Nigeria.

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ABSTRACT

The study was carried out in Imo State to examine the effectiveness of radio-agricultural farmer programme in technology transfer to rural farmers in Imo State, Nigeria. Multi-stage random sampling technique was used to select 120 respondents from the three agricultural zones of Imo State. Data were obtained using interview schedule and were analyzed using descriptive and inferential statistics. Result shows that majority of the respondents were males, married and educated with the mean age of 46 years. Result indicates that majority of the respondents indicate that radio-agricultural farmer programme was effective in technology transfer to rural farmers. Result further indicates that most (100%) of the respondents confirmed that improved technologies transferred were relevant to their farm practices.

Keywords: Effectiveness, radio-agricultural farmer, technology transfer.

E-mail: faithwinet@yahoo.com.

INTRODUCTION

The role of agriculture in economic development has long been recognized and it can play an important role in reducing poverty and serve as an engine for economic growth in developing countries (Foster and Rosenzweig, 2010). Today, knowledge, technology and creativity are the key driving forces in social and economic development of any nation: while in the past, economic growth was underpinned by traditional factors of production such as land, labour and capital. The critical drivers of global economic trends today are know-how, technology, creativity and information (Eboh, 2009).

Research findings indicate that the major missing link between research and sustainable food production is lack of effective information delivery system. The ratio of extension agents to farmers in Nigeria, especially in Imo State is grossly inadequate making extension workers to reach insignificant number of the farmers, hence a wide gap exist between available knowledge of improved technology and actual practice.

This has had negative effect on attempts to increase food production. It is, therefore, necessary to highlight the use of alternative channels of information to enable farmers to have more access timely to improve technologies that will enhance agricultural productivity. Among the mass media methods, radio farmer programme is used to reach large number of farmers quickly as well as making them aware of innovations and stimulates their interest (Agwu et al., 2008).

In a related development, Imo State Agricultural Development Programme (ADP) via radio-agricultural programme has transferred improved technologies to farmers in order to alleviate the problem of sustainable food production in the area.

Effective means adequate to accomplish a purpose, producing the intended or expected result. It means functioning. Effectiveness is the influence or capacity or validity of something to perform the expected task and produce the needed results (Advanced Learners Dictionary, 2002). Radio-agricultural farmer programme is a mass medium channel for transmitting a message through the radio-programme (Akubuilo, 2008). It is a joint effort of an agricultural expert and a communication

expert (radio-presenter) disseminating agricultural technologies/information to farmers. Radio-agricultural farmer programme in Imo State has gone a long way. Radio-agricultural farmer programme aims at teaching and transferring modern technologies to farmers in order to increase their agricultural production. Radio-agricultural farmer programme is a kind of "school in air" where farmers are the students or audience (Njoku, 2014).

Radio-agricultural farmer programme covers all components of agriculture namely: crop, animal, agro-forestry, agro-fishery, and soil conservation.

Despite efforts by ADP via radio-agricultural farmer programme in transferring improved technologies to rural farmers in order to alleviate the problem of sustainable food production within the area, the problem of sustainable food production remains very high. This gap between sustainable food production and effectiveness of radio-agricultural farmer programme in technology transfer to rural farmers needs to be examined. The specific objectives of the study were to: examine the perceived relevance of improved technology transferred and effectiveness of radio-agricultural farmer programme in technology transfer to farmers, describe socio-economic characteristics of rural farmers.

The study assumed that there was no significant relationship between socio-economic characteristics of rural farmers and effectiveness of radio-agricultural farmer programme in technology transfer to rural farmers in the study area.

MATERIALS AND METHODS

Study area

This study was conducted in Imo State, Nigeria. Imo State is located in the South East agro-ecological zone of Nigeria. The state lies between latitude 5° 45′ N and longitude 6° 35′ E of the Greenwich Meridian (ISMLSUP, 1999). The state is located within the rain forest belt of Nigeria. It is bounded in the East by Abia State, North West by Anambra State, South-South by Rivers State. Imo State has a population of 3,934,899 persons, with a total land area of 5,530 km^2 (NPC, 2007).

The state is divided into three agricultural zones namely: Owerri agricultural zone with twelve extension blocks, Orlu agricultural zone with nine extension blocks and Okigwe agricultural zone with six extension blocks summing up to twenty seven extension blocks. It is further divided into three hundred and five extension circles and numerous sub-circles. The state is an agrarian state. It is a home of many federal and state tertiary institutions.

The list of rural farmers who are radio-agricultural farmer programme listeners were collected from the ADP zonal offices with the help of extension agents in the three agricultural zones. Random sampling technique was used in selecting radio-agricultural farmer programme listeners from the three agricultural zones, Owerri, Orlu and Okigwe, with interview schedule, and they were analyzed using descriptive and inferential statistics. Descriptive statistics was used to describe the socio-economic characteristics of the farmers and the perceived relevance of improved technologies transferred and effectiveness of radio-agricultural farmer programme in technology transfer to the farmers in the study area. A 5-point likert type of scale was used to determine the mean. A mean score of 3.00 was taken as bases of judgment. While multiple regression analysis was used to determine the relationship between the socio-economic characteristics of the rural farmers and effectiveness of radio-agricultural farmer programme in technology transfer to rural farmers in the study area. The implicit form of the model used is stated as follows:

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9, X_{10}, X_{11}, X_{12} + e)$

Where Y = effectiveness of the radio-agricultural farmer programme in technology disseminated.

X_1 = age of farmers in years
X_2 = sex of respondents (male = 1, female = 0)
X_3 = level of education of respondents in years
X_4 = marital status (married = 1, otherwise = 0)
X_5 = household size (number of persons in household)
X_6 = ownership of radio set (yes =1, no =0)
X_7 = adequacy of programme
X_8 = convenient time to listen (yes or no)
X_9 = extension contact (times)
X_{10} = farm size of respondents (hectares)
X_{11} = membership of rural organization (yes or no)
X_{12} = annual income (naira)
e = error term

RESULTS AND DISCUSSION

The results presented in Table 1 show the socio-economic profile of the respondents. Table 1 reveal that majority (46.7%) of the respondents belong to the age group of 40 to 49 years, with the mean age of 46 years. This implies that farmers were in the active stage of life and had the advantage of increased investment and improved technology utilization and hence innovativeness. The findings on mean age of farmers agreed with those of Kowale et al. (2003) and those of Agwu et al. (2008) and Ohajianya and Onyenka (2000) that most farmers in Nigeria are in their active stage of life. The table further shows that majority (79.2%) of the farmers were males, married (83.3%) and educated (60.8%). The mean level of education was 8.5 years which implies that most of the farmers who listen to radio-farmers programme were literates and this is an advantage to adoption and utilization of improved technologies as education is a factor in adoption of modern farm practices.

The table also show that majority (57.5%) of the respondents had household size of 5 to 8 persons with a mean household size of 8 persons. This implies that more family labour since household size is an advantage to adoption of increased technologies. The table further shows that majority (57.5%) of the respondents had farm size of 1.7 to 2.2 hectares of farm land with a mean farm size of 1.9 hectares of farm land. The result implies that the respondents comprised of small scale farmers.

The table further shows that majority (60.8%) of the respondents belong to farmers association membership which implied high innovativeness among the farmers due the presence of group dynamic effects. The table indicates that most (46.7%) of the respondents had annual farm income of ₦151 to ₦200. The mean annual

Table 1. Distribution of the respondents by socio-economic characteristics (n= 120).

Variables	Frequency	Percentage	Mean ($\bar{x}$)
Age (years)			
20-29	9	7.5	
30-39	17	14.2	
40-49	56	46.7	46.0 years
50-59	20	16.7	
60-69	18	15.0	
Sex			
Male	95	79.2	
Female	26	20.8	
Marital status			
Married	100	83.9	
Single	7	5.8	
Widowed	13	10.8	
Household size			
1-4	14	11.7	
5-8	69	57.5	
9-12	23	19.2	8 persons
13-16	14	11.7	
Level of education			
0 (No formal education)	6	5.0	
1-6	27	22.5	
7-12	73	60.8	8.5 years
13-18	14	11.7	
Farm size			
1.1-1.6	14	11.4	
1.7-2.2	69	57.5	1.9
2.3-2.8	23	19.2	
2.9-3.4	14	11.7	
Membership of rural organization			
Farmers Association	73	60.8	
Cooperative Society	27	22.5	
Women Group	14	11.7	
Thrift Association	6	5.0	
Annual farm income (000)			
≤ 50	9	7.5	
51-100	17	14.2	
101-150	20	16.7	161,620
151-200	56	46.7	
201 and above	18	15.0	
Source of fund			
Personal savings	69	57.5	
Relatives/Friends	23	19.2	
Microfinance Banks	20	16.7	
Commercial Banks	8	6.7	Multiple responses

Table 1. Continues.

Extension contacts (number of visits)			
0 (no visits)	27	22.5	
1-2 times	73	60.8	
3-4 times	14	11.7	1.4 visits
5 and above	6	5.0	

Source: Field Survey (2015).

Table 2. Distribution of rural farmers by perceived relevance of improved technologies transferred via radio-agricultural farmer programme farmers/farm practices.

Improved technology transferred	Degree of relevance										Mean ($\bar{x}$)
	Very irrelevant (1)		Not relevant (2)		Undecided (3)		Relevant (4)		Very relevant (5)		
	Freq.	%	Freq.	%	Freq.	%	Freq.	%	Freq.	%	
Practical tips on crops	9	7.5	17	14.2	18	15.0	56	46.7	20	16.7	4.4
Fertilizer application	3	2.5	3	2.5	18	15.0	16	13.3	60	50.0	4.6
Dry season veg. production	2	1.7	3	2.5	18	15.0	30	25.0	57	47.5	4.5
Soil conservation practice	4	3.3	16	13.3	20	16.7	20	16.7	60	50.0	4.4
Yam minisette	3	2.5	9	7.5	12	10.0	20	16.7	76	63.3	4.6
Snailery technique	3	2.5	9	7.5	12	10.0	18	15.0	78	65.0	4.6
Fish farming technique	9	7.5	17	14.2	18	15.0	56	46.7	20	16.7	4.4
Cassava-maize/yam intercrop	3	2.5	3	2.5	18	15.0	16	13.3	60	50.0	4.5
Non-ruminant vaccination	2	1.7	3	2.5	18	15.0	30	25.0	57	47.0	4.5
Yam staking technique	3	2.5	9	7.5	12	10.0	20	16.7	76	63.0	4.6

* Perceived Relevance Technologies. Source: Field Survey (2015).

income was ₦161,623.61 which implied that farmers although operating on small scale earned reasonable farm income after producing most of their family food consumption needs. The table shows that most (57.5%) of the farmers had personal savings as their major source of fund. This result implies that farmers' source of fund was through informal sources.

The table also indicates that most (60.8%) of the farmers had 1.2 visits with extension agents. The mean extension contacts was 1.4 visits which implied low extension visits and this is a disadvantage to adoption of improved technologies.

Table 2 revealed that all the agricultural technologies transferred had mean score above 3.00. This implies that they were perceived by the rural farmers as relevant. This could be because the information disseminated bothered on the major crops and livestock grower or reared by the farmers in the study area. The relevant improved technologies with highest mean score were fertilizer application while the technology with the lowest mean score was practical tips towards crops. Other agricultural technologies disseminated to rural farmers through radio-agricultural farmer programme were also relevant but had varying degrees of relevance. These findings were similar to those of Agwu et al. (2008) and Echetama (2013). They generally implied that the resources invested in the use of radio-agricultural farmer programme in technology transfer to rural farmers in the study area were not

Table 3. Distribution of rural farmers by fffectiveness/qualities of radio-agricultural farmer programme in technology transfer.

Qualities of radio-agricultural farmer programme	Frequency	Percentage
Accessibility of programme		
Yes	114	95.0
No	6	5.0
Usefulness of message		
Useful	115	95.8
Not useful	5	4.2
Communication effectiveness		
Effective	110	91.7
Not effective	10	8.3
Regularity of programme		
Regular	80	66.7
Not regular	40	33.3
Timeliness of programme		
Timely	75	62.5
Not timely	45	37.5
Appropriate to farming activities		
Appropriate	102	85.0
Not appropriate	18	15.0
Source of agricultural information		
Yes	102	85.0
No	18	15.0
Opportunities to ask questions		
Yes	0	0.0
No	120	100.0
Satisfaction with the programme		
Satisfied	90	75.0
Not satisfied	30	25.0
Suitability of the programme		
Suitable	50	41.7
Not suitable	70	58.3

Source: Field Survey (2015).

wasted as the farmers considered all the agricultural technologies disseminated to be relevant to their farming needs.

Table 3 revealed that all (100%) of the respondents indicated that they do not have opportunities to ask questions. The result further shows that majority (95.0%) indicates that radio-agricultural programme was accessible to them. Also majority indicates that the message was useful, appropriate and source of good information on agricultural production. The findings on effectiveness of radio-agricultural farmer programme in technology transfer to most farmers agreed with those of Ango et al. (2013) and those of Oyegbami and Fabosoro (2003), that most farmers confirmed that radio-agricultural farmer programme was effective in technology transfer to rural farmers.

Table 4. Result of four functional forms of multiple regression estimate on the relationship between farmer's socio-economic profile and effectiveness of radio-agricultural farmer programme in Imo State, Nigeria.

Explanatory variable	Linear	Semi-log	Double-log	Exponential
Constant	229.034	187.165	143.407	102.559
Age of farmer (X_1)	-14.316 (-1.818)	-3.119 (-2.467)*	-0.072 (-1.603)	-0.006 (-1.713)
Sex of farmer (X_2)	-10.244 (-1.642)	-3.008 (1.716)	-0.039 (-1.416)	-0.008 (-1.553)
Level of Education (X_3)	12.847 (3.109)**	4.994 (3.073)**	0.073 (3.108)**	0.009 (3.016)**
Marital status (X_4)	1.333 (1.564)	2.908 (1.656)	0.046 (1.829)	0.007 (1.4418)
Level of Income (X_5)	14.592 (2.914)**	3.115 (1.777)	0.066 (4.169)**	0.008 (3.413)**
Ownership of radio set (X_6)	11.387 (1.514)	2.692 (1.409)	0.053 (1.316)	0.007 (1.811)
Household size (X_7)	-10.827 (-2.668)**	-4.089 (-1.365)	-6.091 (-3.094)*	-0.001 (-2.520)
Adequacy (effectiveness) of agricultural convenient of programme (X_8)	12.464 (1.391)	3.547 (1.825)	0.681 (1.922)	0.004 (397)
Provision of agricultural technology (X_9)	13.829 (1.698)	4.663 (1.742)	0.055 (1.613)	0.009 (1.814)
R^2	0.4938	0.4125	0.7628	0.6123
F-value	21.9467**	16.1765**	737005**	36.1239**
Sample size (n)	120	120	120	120

Figures in parenthesis are t-ratios. * Significant at 5%; ** Significant at 1%. Source: Field Survey (2015).

The finding indicates that radio-agricultural farmer programme passed 9 of the 10 indicators of evaluating the effectiveness of the radio-agricultural programme in the study area. This implies that radio-agricultural farmer programme was effective in technology transfer to rural farmers in Imo State, Nigeria.

The result further showed that radio-agricultural farmer programme was effective as confirmed by (91.7%) of the respondents. Result indicated that most (100%) of the respondents attested that they were not given opportunity to ask questions. This situation does not favour effectiveness of radio-farmer programme.

As in Table 4, the results of four functional forms of the multiple regression estimate showed that the double-log function produced the highest volume of coefficient of determinant (R^2). The value of the coefficient of determinant (R^2) was 0.7628; this implies that 76% of the effectiveness of radio-agricultural farm programme was accounted for by the joint action of independent variable. The coefficient of the farmers that adopted transferred technologies (X), age of farmers (X_1), sex of farmers (X_2), marital status (X_4), ownership of radio-set (X_6), adequacy (effectiveness) of radio-agricultural farm programme (X_8) and provision of technology (X_9) were not significant at 0.05 level but significant at 0.01 level of significant.

CONCLUSION AND RECOMMENDATIONS

The study examined the effectiveness of radio-agricultural farm programme in technology transfer to rural farmers in Imo State, Nigeria. Results obtained from

the study using multiple regression model showed that age, educational level, annual income, household size, sex, marital status, adequacy of radio-agricultural farmer programme, ownership of radio-set, provision of technology and adoption of technology transferred were not significant at 0.05 level.

Results further indicated that all technology transferred to the farmers through radio-agricultural farmer programme were relevant to the farmer's farm practices. The results also indicate that radio-agricultural farm programme was effective in technology transfer to rural farmers although factors such as lack of opportunities for the respondents to ask questions and non-conformity with the seasonal farm activities hampered the effectiveness of radio-agricultural farmer programme.

The study therefore recommends that deliberate policy aimed at farmer's participation in the planning, execution and implementation of future radio-agricultural farm programmes.

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