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Effectiveness of Agricultural Extension Education Methods on Adoption of Innovations Among Small-Scale Rice Farmers

Gana, E.S. and Yisa, E.S.

Department of Agricultural Economics and Extension Technology, Federal University of Technology, Minna, Nigeria.

ABSTRACT

The study examined the effectiveness of agricultural extension education methods used to teach small-scale rice farmers in Doko Local government area of Niger State in Nigeria. Data was collected by means of scheduled interview questionnaire from eight (8) extension cells of Doko extension block. A total number of 160 farmers from eight villages were purposely and randomly selected. The data was analyzed using simple descriptive statistics such as percentages, frequency distribution and chi-square respectively. It was observed that 32.2% of the respondents had no formal education, 50% had Quranic and primary education, while only 17.5% had secondary and post-secondary education. Considering the extension methods used to reach the small-scale rice farmers, 87.5% of the respondents said that they had listened to farm radio programmes, 41.88% of the respondents said that they had visited demonstration plots and adopted the new rice innovations. Forty percent (40%) of respondents claimed that they had been visited by village extension workers who made them adopt new rice innovations. The calculated chi-square value 142.5 showed significant difference ($tP = 0.05$) in rice yield per hectare of these participating farmers. Specific education programmes should be organized to train farmers on the correct use of recommended innovations for rice production.

INTRODUCTION

Food security is an important and integral part of the national security drive in Nigeria. Today, rice has become one of the major staple foods of Nigerians. This is due primarily to rapid urbanization, which is associated with family occupational structures. As women enter the work force, convenience foods such as rice, which can be prepared quickly, rise in importance. Similarly, as men work at greater distances from their homes in the urban setting, more meals are consumed from market where ease of rice preparation has given it a distinct advantage such that rice is no

longer a luxury food but has become a major source of calories for the urban poor, Echiegu [2003]. A limited portion of the locally grown rice crop is, however, available for key urban market centers because small-scale rice farmers only produce subsistence level of rice. In the face of this situation, the Federal Ministry of Water Resources [2002] reported that imported rice exceeded the supply of local rice. The estimated amount of imported rice was put at market value of over N 126 billion [USDA]. Because of this, the Presidential sub-committee on rice production and exportation recommended that the Government should henceforth ban importation of rice in order to encourage small-scale rice farmers to take up the challenge of producing rice to meet both, the demand of local consumers and export to earn foreign exchange. Consequently, the liberalization policy of petroleum and gas sector is envisaged to generate sufficient revenue, which would be ploughed back to refurbish the abandoned small-scale rice irrigation schemes and to construct new ones all over the nation. The agricultural extension service of Niger State Agricultural Development Project with the extension mandate given to her would continue to encourage small-scale rice farmers to adopt recommended research findings by using various education methods in order to promote local rice production to meet the population growth.

PROBLEM STATEMENT AND OBJECTIVES

The irrigable flood plains of rivers Niger and Benue, using modern technology, has the potential of yielding 5 tonnes/hectare of paddy rice in rainy season and 10 tonnes/hectare in the dry season. [Olukoya, 2003]. Echiegu, [2003] reported that small-scale rice farmers in Nigeria could only produce 2.75 tonnes/hectare of paddy rice at present. He went on to add that local rice that is usually processed unpolished is tastier and more nutritious than the imported polished one.

The challenge today is how to harness the potential attributes of local rice to the advantage of Nigerians who have been largely used to the imported types. There are more than 50 varieties of rice in the local markets. Hence the need is to select the best varieties and promote them to have

impact in the country through teaching the small-scale farmers new innovations. In order to hasten the spread of adoption of the new innovations by the rice farmers, it is necessary to examine effectiveness of the teaching methods used by extension workers. The general objective of the study was to find out the various extension methods used by extension workers to educate small-scale rice farmers in Zone I of Agricultural Development Project, Niger State.

The specific objective[s] include:

- i. to identify the best sources of information methods used to teach small-scale rice farmers; and
- ii. to find out the yield of paddy rice per hectare before and after adoption of new innovations by small-scale rice farmers.

MATERIALS AND METHODS

Area of Study

The project research study was carried out in Doko Local Government Area of Niger State. The major tribe of this community is Nupe. However some negligible percent of Hausa, Yoruba and Igbo reside in the area. The Local Government Area has one extension block. The extension block has further been sub-divided into eight cells/villages where the village extension agents [YEA] work. These villages include: Doko, Jima, Tafya, Gaba, Manbe, Kutogi-Dadi, Pati-shabakolo and Kuchi-woro respectively. Michael, [1978] reported that the Doko extension block had a mean rainfall of 762mm-1016 millimeters annually. He stated further that it had a temperature of about 27. 77°C.

Doko is on latitude 8°N and longitude 5°E. The area falls within the guinea- savanna zone. In the North, it shares borders with Bida and in the East with Kwara State. The extension block has a fertile flood plain and dark clay soil suitable for abundant rice production.

SAMPLING PROCEDURE AND SAMPLE SIZE

A purposive random sampling technique to select the participating small-scale farmers was based on the fact that rice is the main cereal crop cultivated for food and cash crop by the farmers. The extension block is divided into eight cells/villages, each having an extension agent.

Selection of the respondents from the villages is indicated as follows: Doko [18], Jima [21], Tafya [22], Gaba [38], Manbe [41], Kotugi-dadi [12], Pati-shabakolo [3], and Kuchi-woro [5]. The figures in parentheses indicate the number of respondents from each cell. The study was conducted between July 2003 and March 2004.

MEASUREMENT OF VARIABLES

Personal characteristics of respondents

This was measured in respect to the gender, age, marital and educational status of the respondents in connection with adoption of new innovations on rice production.

Various extension methods taught to the respondents

The one hundred and sixty respondents sampled were asked to indicate the type or extension methods and their effectiveness on getting them to adopt new innovations.

Benefits, if any, on the adoption of new innovations by the respondents.

This was measured by the highest number of frequency of respondents occurring to the specific teaching methods they had received from the extension workers on the yield of paddy rice per hectare before and after the adoption of new innovations.

Data collection

Primary data was obtained through the administration of scheduled interview questionnaire, while secondary data was generated from published and unpublished reports.

Data was analyzed using simple descriptive statistics such as frequency distribution, percentages and chi-square.

RESULTS AND DISCUSSION

The analysis of the data collected from one hundred and sixty respondents concerning the effectiveness of various extension methods taught by extension workers were based on the personal characteristics of the small-scale farmers. These include: gender, age, marital, educational

Table 1 : Personal Characteristics of the respondents.

Variable	Frequency and (%)
Gender	
Male	95[59.37]
Female	65[40.63]
Age	
Under 20	8[5]
21-30	24[15]
31-40	68[42.5]
41-50	32[20]
51-60	20[12.5]
61and above	8[5]
Mean	36
Marital status	
Single	35 [21.88]
Married	125[71.28]
Educational status	
Had no formal education	52[35.2]
Had Quranic education	40 [25]
Had Primary education	40 [25]
Had Secondary education	16 [10]
Had post primary education	12 [7.5]
Others	0[0]

Figures in parenthesis are percentages.
Source : Field survey 2004.

status, and the effectiveness of extension teaching methods and yield of paddy rice before and after the adoption of innovations.

Table 1 shows that rice production in the Doko extension block is male dominated, as 59.37% are male while 40.63% are female. This is in agreement with previous studies, Okojie [1983], that farm work is not a vocation exclusive to males alone, but that women do cultivate, weed, process and market farm crops. He added that women supply over 60% of agricultural labour force in Africa. The results further showed that 42.5% of the respondents were within the age of 31-40 years old, while 20% said that they were within the age of 41-50 years old. The mean age of the farmers was put at 36 years. This agrees with Achi,[2002] who reported that farmers within the age of 31-40 years were youths who are active in farming and willing to adopt new innovations. A Majority of the respondents are married [78.12%], this is an indication that these farmers are likely to be more committed to farm work because they have to cater for their family needs. It was observed that 32.2% of the respondents had no formal education, 50% had Quranic and primary education, while only 17.5% had secondary and post secondary education. The opportunity opened to rural communities with respect to having been educated is not

Table 2 : Effectiveness of various extension-teaching methods the extension workers had used.

Variable	Frequency N and %
Listened to radio farm programmes and adopted new rice innovations	140[87.5%]
Watched television farm programmes and adopted new rice innovations	9[5.6%]
Attended demonstration teaching programmes and adopted new rice innovations	67[41.88%]
Read extension publications and adopted new rice innovations	3 [1.90%]
Had been visited by village extension workers and adopted new rice innovations	64[40%]

Figures in parenthesis are percentages.

Source: Field survey 2004.

encouraging since 60.2% of them had Quranic and no formal education. This might be due to poverty, which abounds in rural areas.

Table 2 shows the effectiveness of various extension methods perceived by the respondents. Radio farm programmes had 87.5%, followed by 41.88% for demonstration plots, 40% for visitation, 5.6% for watching television and 1.9% for reading extension publications respectively. Alao [1975] reported that radio farm programmes was the most positive and significant source of teaching agricultural programmes to farmers. Morries [1991] reported that on-farm-demonstration and adaptive trials on farmers' fields had hastened the learning process which made agricultural messages to be more convincing to farmers. The lowest number of respondents who had read the extension publication [1.9%] agrees with National Agricultural Research and Liaison Services [1996] that reported that nearly 80% of people in rural areas are peasant farmers and had low education, with little or no ability to read.

The results from Table 3 showed that 83.1% of the respondents revealed that they had less than 1 tonne of paddy rice from an hectare of rice farm. About 16.9% said they had between 1-2.9 tonnes of paddy rice from an hectare. The poor yield could be attributed to non-adoption of proven new innovations and technologies taught by extension workers.

Table 3 : The yield of paddy rice per hectare before adoption of new farm innovations.

Yield	Absolute Frequency	Relative Frequency (%)
Less than 1 Tonne	133	83.10
1-1.9 Tonnes	19	11.90
2-2.9 Tonnes	8	5.00
3 Tonnes and above	0	0.00
Total	160	100

Mean = 40

$X^2 = 292.8$, Critical X^2 Value = 7.8, df = 3, P = 0.05

Source : Field survey 2004.

This is in line with Joseph, [1992] who reported that majority of small-scale farmers prefer to use traditional technologies compared to recommended research findings.

The results from Table 4 showed that about 56.3% of the respondents said they had 1-1.9 tonnes of paddy rice from a hectare of rice farm, and 20.6% of the farmers revealed that they had 2-2.9 tonnes of paddy rice from a hectare. About eleven percent [10.6%] of respondents had 3-3.9 tonnes of paddy rice from a hectare of rice farm. It was observed that up

Table 4: The yield of paddy rice per hectare after adoption of new farm innovations by small-scale farmers

Yield	Absolute Frequency	Relative Frequency (%)
Less than 1 Tonne	11	6.90
1-1.9 Tonnes	90	56.30
2-2.9 Tonnes	33	20.60
4 Tonnes and above	17	10.60
	9	5.60
Total	160	100

Mean = 32

$X^2 = 142.5$, Critical X^2 Value = 9.49, $df = 4$, $P = 0.05$

Source : Field survey 2004.

to 93.1% of the farmers had yield increase of between 1 and above 4 tonnes of paddy rice from an hectare. The chi-square [$p=0.05$] 142.5 showed significant difference in rice yield per hectare among the farmers. This implies that when farmers adopted new innovations they had higher yields of paddy rice.

CONCLUSION AND RECOMMENDATION

The effectiveness of some extension teaching methods used by extension workers in Doko extension block has been acknowledged. Consequently, contact and non-contact farmers did testify that the increase in yield of paddy rice per hectare was attributed to adoption of new

innovations. Considering the foregoing, it is recommended that :

- i. Agricultural radio programme using local dialects should be broadcast on regular basis to increase awareness of new rice innovations. The farm radio programmes should be aired between 6 - 7 a.m. daily so that farmers will be able to listen to new farm practices before leaving for farm each day;
- ii. More of small plot adoption technique [SPAT] trials should be evenly sited all over the extension block to enable large number of rice farmers have access to them; and
- iii. The extension workers should be urged to pay regular visits to the contact farmers for teaching and training purposes.

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