



ISSN: 2278 – 0211 (Online)

The Influence Of Sources Of Information On Adoption Of Rice Production Technologies By Farmers In Borno State, Nigeria

Ibrahim, A.A.

Department of Agricultural Extension Services, University of, Maiduguri, Nigeria

Ani, A.O.

Department of Agricultural Extension Services, University of, Maiduguri, Nigeria

Mustapha, S.B.

Department of Agricultural Extension Services, University of, Maiduguri, Nigeria

Abstract:

The study analysed the influence of sources of information on adoption of rice production technologies in Borno State, Nigeria. Stratified random sampling method was used to select 534 respondents representing upland, lowland and Fadama rice farmers in the study area. Data were analyzed using both descriptive and inferential statistical tools. The descriptive tools include; frequencies, percentages, Means, and standard deviation. Inferential statistics such as multiple correlation analysis was used to show the degree of relationship between variables. The result indicated that most (40.4%) of the respondents had agricultural extension agents as their main sources of improved rice production technology. This was followed by radio and television, (29%) as the respondents' sources of information on improved rice production technologies. Respondents who were aware of the rice technologies but did not try constitutes a mean of 13% and standard deviation of 3, while respondents that were aware of rice technology and tried it had a mean of 47% with standard deviation of 5.9. The study revealed that 45.3% of the respondents had adoption score of 4.50 and classified as medium adopters. Multiple correlation analysis showed that there was significant relationship between some of the information sources used by the respondents and adoption of rice production technologies promoted by Borno State Agricultural Development Programme. The study recommends that extension agencies should be strengthened in their efforts to create more awareness among farmers on the need to adopt the entire rice production technology package for maximum benefit.

Keywords: Adoption, Influence, Information, Rice production technologies, Nigeria.

1.Introduction

Rice (*Oryza sativa*) is a cereal which has become a staple food of considerable strategic importance in many rapidly growing African cities, where its consumption among urban and rural poor households has increased considerably (WARDA, 2003). Rice is the second most important cereals in the world after wheat in terms of production (Jones, 1995). Nigeria ranks the highest as both producer and consumer of rice in the West Africa Sub-region (Umar, Ndanisa, and Olaleye, 2009). However, in terms of area of land under food crop production in the Country, rice ranks sixth (after sorghum, millet, cowpea, cassava and yam) (Imolehin and Wada, 2000.) The average annual Rice production in Nigeria is dominated by small holder farmers who cultivate small hectares of land using traditional methods of farming; yields are low and hence the wide gap of demand and supply. In order to increase rice production in the country, the federal government of Nigeria has designed policies and programs aimed at boosting domestic production to meet domestic demand since 1989 (Jirgi, Abdulrahman, Ibrahim, 2009). These include amongst others, the Fadama Rice Programme, the Japanese Assisted National Rice Production Project as well as the River Basin Development Rice Programme (Chinaka, Ogbokiri, and Chinaka, 2007). Various Research institutes have been established in the country in order to boost rice production, some of which are the National Cereals Research Institute (NCRI), Badeggi, and National Seed Service (NSS). Some of the improved rice varieties developed by National Cereal Research Institute Badeggi in conjunction with International Institute for Tropical Agriculture (IITA) Ibadan and West African Rice Development Association (WARDA) are FARO 44, FARO 45, FARO 46, FARO 47, FARO 48, FARO 50, FARO 51 and FARO 55 (Jirgi, Abdulrahman, Ibrahim, 2009). The Borno State Agricultural Development Programme has varieties of rice; ITA 212 and ITA 257, Exchaina, Faro -37 and Faro-38 BU 90/2 and DA 29 and Faro – 14 and Faro - 27, with recommended production technologies, which were disseminated to farmers with a view to increasing rice production in the State. The developments of these improved rice varieties are aimed at increasing food production as well as to alleviate poverty. Despite all the efforts made by the government and research institutes, rice production still remains very low. Research has shown that farmers have not adequately adopted improved rice varieties but rather they still depend largely on the local varieties which give low yield and thus low productivity.

Researches have been carried out on the adoption of rice production technologies in Nigeria (Imolehin and Wada, 2000; Umar, Ndanisa, and Olaleye, 2009). However, there has not been any study on the influence of sources of information on adoption of rice production technologies implied in Borno State, Nigeria. Therefore, this study was undertaken to fill this gap of scientific knowledge in the study area.

2.Objectives Of The Study

The main objective of the study was to analyse the influence of sources of information on adoption of rice production technologies in Borno State, Nigeria. The specific objectives were to:

identify the sources of information on rice production technologies by respondents;
assess farmers' awareness of rice production technologies in the study area;
assess farmers' level of adoption of rice production technologies in the study area; and
determine the influence of selected farm information sources on adoption of rice production technologies in the study area.

3.Methodology

3.1.The Study Area

The study was carried out in Borno State which lies between longitudes 11°05' and 11°45' and latitudes 09°10' and 14°20' (BOSADP, 2003). The state has the largest land mass among the states in the Federation. It is bordered internationally by Cameroon to the East, Niger to the North and Chad to the Northeast. Borno state shares internal borders with Adamawa State to the South, Bauchi to the Southeast and Yobe to the West (Daura, 2001). According to the National Population Commission (2006), the State has a population of 4, 151, 193 million people with an annual growth rate of about 3.2 percent. The state has a mean annual rainfall of 250mm in the extreme North and a maximum of 1000mm in the South. The State has a tropical climate marked by alternating dry and rainy seasons, and the average temperature is 38.6° C (BOSADP, 2003).

3.2.Sampling Procedure And Sample Size

Sampling for administering questionnaires was done using the three Agricultural zones. Thus, three (3) Local Government Areas (LGAs) were randomly selected from each of

the three zones giving a total of nine (9) LGAs namely; Dikwa, Marte, Mobbar, Jere, Konduga, Bama, Bayo, Askira-Uba and Shani for the study. Three (3) rice producing villages were randomly selected from each of the nine (9) LGAs, bringing a total of 27 villages from all the three zones.

A stratified random sampling method was used to select the upland, lowland and Fadama rice farmers in the study area. Due to the heterogenous nature of the rice producing farmers in the state, the respondents were divided into three stratified into three sub-groups. The first stratum (sub-group) consists of farmers whose activity was primarily upland rice farming, the second stratum (sub-group) consists of producers from lowland areas and the third stratum (sub-group) was the Fadama rice farmers. The BOSADP provided the sampling frame for the proportionate selection of the respondents in each stratum bringing a total of 534 rice farmers used in the study.

3.3.Data Analysis

Data were analyzed using both descriptive and inferential statistical tools. The descriptive tools include; frequencies (f), percentages (%), Means (π), and standard deviation (sd). Inferential statistics such as multiple correlation analysis were used to show the degree of relationship between variables.

4.Results And Discussion

4.1.Sources Of Information On Improved Rice Production Technology By Respondents

Information is important in the adoption of improved farm practice among farmers, because it has the primary role of making farmers to be aware of existing farm technology, develop their interest, enable them to evaluate the technology and try the existing technology so that they can take final decision to adopt such technology. In this study, the respondents were asked to indicate their sources of information on improved rice production technologies. The respondents' sources of information are presented in Table 1.

Sources of Information	Frequency (F)	Percentage (%)
Radio and Television	155	29.0
Agricultural Extension Agents	216	40.4
Relatives and Neighbors	41	7.7
Research Institutes	20	3.7
Cooperative union and salesmen	73	13.7
Radio/TV and Agricultural Extension agents	26	4.9
Relatives/Neighbors and Research Institutes	1	0.2
No Response	2	0.4
Total	534	100

Table 1: Distribution Of Respondents By Major Sources Of Information Sources; Field Survey, 2006

Table 1 show that 40.4% of the respondents opined that agricultural extension agents were their main sources of improved rice production technology. This was followed by radio and television, (29%) as the respondents' sources of information on improved rice production technologies. About 14% of the respondents indicated that cooperative union and salesmen were their sources of information on improved rice production technology. Only 7.7% of the respondents claimed to have received their information on rice production technology from their relatives and neighbors. About 4% of the respondents received their information on rice production directly from Research Institutes. Evidence from this finding was that 40.4% of the respondents opined that extension agents were their main source of information on improved rice production technologies suggesting that BOSADP staff were instrumental to the delivering of recommended rice production technologies. This study supports the findings of Bzugu, (2002), who reported that the introduction of recommended rice production technology was released to farmers through the ADP nation-wide for several years. Rice farmers reaction in Table 1 were in agreement with that of Iheanacho, (2006) who affirmed that combination of sources of information could be used by extension agents in order to produce the desired result of distributing useful farm information to farmers. Rice farmers' sources of information on rice production technologies vary. Tologbonse, Alabi and Tergama, (2005) was of the view that inadequate sources of information on adoption of recommended rice

production technology, constitutes one of the major problems of the World Bank who sponsored Research/Extension farmer's linkage and delivery system in Nigeria and Sub-Saharan Africa.

4.2. Awareness Of Rice Production Technologies By Respondents

The rice farmer's opinion on their level of awareness of rice production technologies are presented in Table 2. Adoption of rice production technology could not be a snap process but farmers undergo series of decision before finally adopting or rejecting specific rice production technology. Therefore, adoption starts with level of awareness, interest, desire, evaluation, trial and finally adoption/rejection.

Rice Technologies	NR %	NA %	ATDT %	ATT %	PIPPV %
Seed variety	12.7	15.5	9.7	50.6	85.0
Seed selection	7.7	16.3	9.2	50.7	85.0
Land preparation	10.3	16.1	10.1	52.1	86.7
Planting depth	7.1	17.8	9.7	51.1	85.0
Plant spacing	10.3	15.5	9.9	53.6	50.1
Method of weed control	7.1	20.2	12.0	49.8	80.6
Fertilizer application	8.2	16.7	12.4	47.4	78.3
Pesticide application	6.7	18.9	14.8	45.1	75.0
Disease control	7.3	20.4	19.1	42.9	69.2
Irrigation system	6.7	21.3	12.7	46.4	78.5
Water management	8.6	22.3	19.9	35.8	64.3
Tube – wells	8.4	22.3	14.6	38.8	72.6
Modern harvesting	12.0	16.7	11.6	57.2	80.3
Total (N)	230	240	165.7	621.5	70.2
Means (π)	8.4	18.5	13	47	50.1
Standard Deviation (SD)	2.0	2.6	3	5.9	85.0

Table 2: Distribution Of Respondents By Awareness Of Rice Production Technologies

Source: Field Survey, 2006

NR = No response from the respondents; NA = Not aware of the rice technology; ATDT = Aware of the rice technology and not tried; ATT = Aware of technology and tried it; PIPPV = Performance Index Proportionate Percentage (%) Value.

Table 2 shows that 18.5% of the respondents with a standard deviation of 2.6 were not aware of the rice technology. Respondents who were aware of the rice technologies but did not try constitutes a mean of 13% and standard deviation of 3, while respondents that were aware of rice technology and tried it had a mean of 47% with standard deviation of 5.9. Those respondents that could not respond on the level of awareness of rice technologies had a mean of 8.4% with standard deviation of 2.0. It is evident that rice farmers who were aware of the rice technologies and tried (47%) were more than those that did not try it (13%). The performance Index Model (PIM) has provided quantitative information for the analyses on the levels of achievement of the technology transferred and was proportionate to individual rice farmers in the study area. The performance Index Proportionate Value from respondents shows 50.1 mean respondents with standard deviation of 5.9% rated that all the rice production technologies were disseminated to them through BOSADP activities. Usually, technologies were generated from research centers and can only be useful when farmers have access to them. This brings challenge to the work of extension agents. However, BOSADP according to respondents had succeeded in the transfer of rice technologies to more than 50% of the targeted rice farmers in the study area. This result supports the findings expressed by Bzugu (2002), that flow of knowledge was one-way, from researchers via extension workers to farmers.

4.3. Level Of Adoption Of Rice Technologies By Respondents

Table 3 shows the adoption score and level on rice production technologies promoted by BOSADP which were considered for the purpose of classifying respondents into their respective adoption level. Availability of suitable arable land and technologies for rice production are pre-requisite for rapid agricultural development. The issue of agricultural technology adoption by rice farmers had generated an increasing interest in the face of national economy worldwide, this is because the decision to adopt or reject rice production technologies are basically related to various levels of stages within the farmer himself, however in this study area rice farmers' opinion on the stages of their adoption levels of rice technologies were presented in Table 3.

Rice production Technologies	No.of Adopters	% of Adopters	Adoption Score	Adoption Level
Seed selection	332 ^H	62.2	5.01	High
Planting depth	301 ^H	56.0	4.85	High
Plant spacing	299 ^H	56.0	4.85	High
Pesticide application	291 ^H	54.4	4.79	High
Seed variety	287 ^H	53.7	4.76	High
Land preparation	282 ^H	52.8	4.74	High
Herbicide application	278 ^H	52.1	4.71	High
Fertilizer application	261 ^H	48.9	4.61	High
Use of combined harvester	258 ^H	48.3	4.60	High
Tube well	242 ^M	45.3	4.50	Medium
Modern Storage system	241 ^M	45.1	4.49	Medium
Water management	222 ^L	41.6	4.37	Low
Irrigation system	38 ^L	7.10	2.38	Low
Total			Adoption Score	58.64
Mean			Score Values	4.51

Table 3: Distribution Of Adoption Score And Level Of Rice Production Technologies By Respondents

Computed From Field Survey; 2010

High = H, Medium = M, Level = L

Table 3 indicates that majority (62.2%) of the respondents adopted seed selection and has adoption score of 5.0. This means that majority (60.2%) of the respondents who adopted seed selection were classified as high adopters. This was followed by those respondents (56.4%) who adopted planting depth had 4.85 adoptions score and classified as high adopters. Respondents (56.0%) who adopted plant spacing and whose adoption score were 4.83 were classified as high adopters. Those respondents (54.4%) who adopted pesticide application for the control of rice pest had adoption score of 4.78 and were also considered as high adopters. Those respondents who adopted seed varieties had adoption score of 4.7 and were classified as high adopters too. It is a common

knowledge that various types of weed were associated with rice crops and herbicide application with the adoption score of 4.71 which were classified as high adopters. This was followed by those respondents (48.9%) that adopted fertilizer applications had adoption score of 4.61 and are classified as high adopters. Respondents (48.3%) had adopted combined harvesters as their rice production technologies with adoption score of 4.60 which was regarded as high adopters. It is evident from these findings that 45.3% of the respondents had adoption score of 4.50 classified as medium adopters and 45.1% of the respondents adopted modern storage system with 4.49 adoption score was also regarded as medium adopters. Similarly, 41.60% of the respondents had adopted modern water management system with the adoption score of 4.37 considered as low adopters. Only 7.10% of the respondents had adopted modern irrigation system with adoption score of 2.38 who were classified as low adopters. Generally, nine out of the 13 rice production technologies promoted by BOSADP had been classified under high adopters while two of the rice technologies were considered as medium adopters. The rest (2) of the technologies promoted by BOSADP fall under low adopters suggesting that respondents rated BOSADP performance high in terms of technology transfer.

4.4. Influence Of Information On Adoption Of Rice Production Technologies By Respondents

Multiple correlation analysis shows the relationship between selected information sources used by the respondents and adoption of rice production technologies (Table 4). The result showed that out of the thirteen rice production technologies promoted by BOSADP, extension contacts did not contribute as a source of information towards adoption of pesticide application. This means that extension contact was not perceived as a source of information of the respondents. This could be due to the fact that extension agents had contact with the respondents, but did not disseminate information on pesticides application. Newspapers and magazines were not contributory factors as major information source on the adoption of rice disease control. The reason might not be unconnected with the low level of literacy in addition to the high cost of newspapers and magazines on the part of the respondents. The lower the literacy level coupled with to high cost of newspapers and magazines, the lesser the perception of the selected sources of farm information used by the respondents. This could be as a result of the fact that extension contact was second to radio and television as the major information sources for

rice farming activities. The result of the finding shows that modern storage facilities, diseases control, irrigation system, water management, and tube wells were not significantly related to radio and television as the major source of information of rice production technologies by the respondents.

Technology/practice	Extension contact (r-value)	Newspapers & Magazine (r-value)	Radio & television (r-value)
Planting depth	0.282**	0.101*	0.091**
Planting spacing	0.178**	0.114**	0.183**
Herbicides application	0.143**	0.099**	0.148**
fertilizer application	0.177**	0.197*	0.134**
application of pesticides	0.206**	0.137**	0.137
Use of modern harvesters	0.290**	0.107**	0.088**
Modern storage facilities	0.279**	0.253**	0.040
Diseases control	0.277**	0.065	0.007
Irrigation system	0.305**	0.112**	0.073
Water management	0.240**	0.211**	0.043
Tube –well	0.265**	0.199**	0.038
Wash borehole	0.260**	0.114**	0.108
Affordability of rice varieties	0.175**	0.367**	0.398*
Pesticides	0.045	0.328**	0.312**

Table 4: Relationship Between Selected Information Sources And Adoption Of Rice Production Technologies By Respondents

Source: Computed From Field Survey, 2010

*** Significant At 5% Level*

** Significant At 10% Level*

5. Conclusion

The study revealed that most of the respondents had extension agents as their main sources of information on rice production technology. The Performance Index Proportionate Value (PIPV) indicated that all the rice production technologies were disseminated through Borno State Agricultural Development Programme (BOSADP) activities in the study area. The study also indicated that majority of the respondents adopted seed selection and was classified as high adopters. Results of the relationship between selected information sources and adoption of rice production technologies revealed that extension agents did not contribute as a source of information towards adoption of pesticides application. Newspapers and magazines were not contributory factors as major information source on the adoption of rice disease control. The result of the finding shows that modern storage facilities, diseases control, irrigation system, water management, and tube wells were not significantly related to radio and television as the major source of information of the option of rice production technologies by the respondents.

6. Recommendations

Based on the findings of the study, the following recommendations were made: -

- Extension agencies should be geared up in their efforts to create more awareness among farmers on the need to adopt the entire rice production technology package for maximum benefit.
- Radio and television should be used to create enhanced awareness and consequently among farmers on rice production technology in the study area.
- Farmers should form rice farmers' cooperative societies to take advantage of governments and non-governmental organizations on input delivery and other programmes in the study area.

7.Reference

1. BOSADP (2003). Borno State Agricultural Development programme (BOSADP). Annual Report, Borno State of Nigeria.
2. Bzugu, P. M. (2002): Factors Influencing Adoption of Farm Technological Innovations among Cereal Crop Farmers in Adamawa State, Nigeria. Unpublished Ph.D Thesis, Agricultural Extension and Rural Sociology, University of Maiduguri, Nigeria.
3. Chinaka, C.C, Ogbokiri, L. C. and Chinaka E. C. (2007). Adoption of Improved Agricultural Technologies by Farmers in Aba Agricultural Zone of Abia State. Proceedings of the 41st conference of the Agricultural Society of Nigeria, IAR/ABU Zaria, Nigeria. Pp. 531-534.
4. Daura, M.M. (2001). The physical environment and development: A study of Borno region in environment and development issues in Sub – Sahara Africa. Seminar Series, vol.1. Faculty of Social and Management Sciences, University of Maiduguri, Nigeria, PP34 – 47.
5. Idiong, I. C. (2005):Evaluation of Technical, Allocative and Economic Efficiencies in Rice Production in Cross Rivers State. Nigeria. Unpublished Ph.D Dissertation Presented To The Department of Agricultural Economics, Michael Okpara University of Technology, Umudike, Nigeria.
6. Iheancho, A. C. (2006): Economics of Millet Production Under Different Cropping Systems in Borno State of Nigeria, Unpublished Ph.D Thesis submitted to the Department of Agricultural Economics and Rural Sociology. A.B.U. Zaria
7. Imolehin, E. D. and Wada, A. C.(2000). Meeting Rice Production and Consumption Demand of Nigeria with improved Technologies, International Rice Commission Newsletters: Vol.49 FAO , Rome
8. Jirgi, A.J., Abdulrahman, M. Ibrahim, F.D.(2009):Adoption of Improved Rice Varieties among Small-Scale Farmers in Katcha Local Government Area of Niger State, Nigeria. Journal of Agricultural Extension, Vol. 13(1) pp95-101.
9. Jones, M. P. (1995). The Rice Plant and its Environment: West African Rice Development Association Training Guide 2. Pp 1-6
10. National Population Commission (2006): National Planning Commission, Federal Office of Statistics, Abuja Nigeria.

11. Tologbonse, E. B; Alabi M. O. and Tergama, A. (2005); Adoption of Recommended Crop Protection Practices by Sesame Farmers in Benue State, Nigeria. Journal of Agricultural Extension, Vol.8 Pp 106.
12. Umar,S.,Ndanisa,M.A. and Olaleye,S.R.(2009): Adoption of Improved Rice Production Technologies Youth Farmers in Gbako Local Government Area Niger State, Nigeria. Journal of Agricultural Extension, Vol. 13(1), pp1-8.
13. West African Rice Development Association (WARDA). (2003): Rice Trends in Sub-Saharan African: A Synthesis of Statistics on Rice Production, Trade and Consumption, UK, Sayce Publishing, Pp. 1-22.