

Adoption Of Agricultural Innovations By Rice Farmers In Yola – South Local Government, Adamawa State, Nigeria

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Abstract- Technological development and planned dissemination of ideas are necessary ingredient for the development of peasant production system and welfare. This study examined the adoption of agricultural innovation by rice farmers in Yola – South Local Government, Adamawa State. The research focused on the extent to which farmers adopt innovations, the determinants of adoption of innovations by the farmers. Structured questionnaires were distributed to one hundred respondent who were mainly rice farmers using a simple random sample technique. Data were analysed using simple descriptive statistics and chi-square tests. The study revealed that age and education level of the farmers contributed significantly to the rate of adoption of innovations. Major constraints faced by farmers which greatly impede their adoption of agricultural innovations in the study are input, economic and extension service. The study also recommended the provision of agro-service centre by government in rural areas for timely provision, delivery of farming inputs and to strengthen the provision of facilities through the rural banking scheme by making funds available for loans.

Keywords- Adoption, Agricultural innovations, Rice Farmers, determinants, age, educational level

I. INTRODUCTION

Adoption is the decision by farmers to accept and make full use of an innovation which provides the means of achieving a sustainable increase in farm productivity and consequently leading to improved living standard of the people (Adams, 1983). These innovations include improved ideas, methods, practices and inputs, which supersedes the ones previous in use.

Agricultural innovations are defined as new ideas, practices or techniques which provide the means of achieving sustained increase in farm productivity and income (Adams, 1983). Adoption is a mental decision by farmers to make full use of new idea(s) as the best cause of action. Increase in productivity in the traditional agriculture requires an adoption of improved technologies. Efforts have been made by government to increase the productivity of the farmers through the introduction of numerous improved practices. Consequently, efforts have also been directed towards creating awareness of these improved practices and

persuading farmers to adopt, even though the traditional farmers is bound to his local ideas and most often sceptical to new ideas (Auta, 1992).

Production continues to grow at a slow pace because farmers do not readily accept innovations immediately. They are still sceptical about innovations and dogmatic on their beliefs hence they need time before making any rational decision.

In recent years, agriculture in most countries has shown encouraging signs of change from traditional to modern agriculture through conversion of agricultural technology into production accomplishment (Pandey, 1989). Robert and Timothy (1995) indicated that profit is the major reason for adopting an innovation. Farmers assess an innovation based on economic factors and concepts, such as risk in past and present practices, production alternative and compelling production practices.

This study examined the extent of adoption and the determinants of adoption of agricultural innovations by farmers in Yola- South Local Government, Adamawa State.

II. MATERIALS AND METHODS

The study was carried out in Yola-South Local Government Area of Adamawa state, Nigeria. It lies between latitude 9°14'N of the equator and longitude 12°28'E of the Greenwich meridian. The average annual rainfall is less than 1,000mm due to the influence of altitude. The maximum temperature can reach 40°C particularly in March and April which are the hottest periods, while the minimum temperature can also be as low as 18°C between December and January. The relative humidity around January and March is extremely low between 20 – 30% (Adebayo and Tukur, 1999).

The study area has two (2) districts with ten (10) wards – Yola-South Districts covers Toungo, Bako, Bamoi, Makama, Adarawo, Wuro Hausa, Bole and Yolde Pate Wards. While Namtari district has Namtari Yolde and Yolde Kohi Wards respectively. The major occupation of the people in the area is farming and commercial activities. The major crops grown are rice, maize, guinea corn, beans and vegetable production.

Data collected for this study were obtained mainly from primary and secondary sources. The primary data were collected through the use of structured questionnaires and interview schedule, while the secondary source of data include journals, publications, seminars/workshop papers, texts and other relevant works. A total of 100 farmers were

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sample using simple random sampling technique. Six out of the ten wards in the two districts of the local government were sampled out using a purposive sampling technique for the purpose of the study. However, only seventy-one questionnaires were retrieved and used in the analysis of data for the study. Data was analysed using simple descriptive statistics (tables, frequency distribution and percentages). Variables analysed included age, educational level, socio-economic status of adoptors and non-adoptors.

Chi-Square test was used to compare observed frequency with those of expected frequencies related to variables such as age and education and adoption attitudes of farmers.

III. RESULTS AND DISCUSSION

A. Extent To Which Rice Farmers In The Study Area Adopt Innovations In Rice Production

Table 1. Distribution of farmers on the basis of their adoption of agricultural innovations

Improved technology	Adoptors		Non-Adoptors	
	Frequency	Percentage (%)	Frequency	Percentage (%)
Inorganic fertilizer	67	94.4	4	5.6
Herbicide	48	67.6	23	32.4
Improved seed	43	60.6	28	39.4
Tractor	38	53.5	33	46.5
Insecticide	31	43.7	40	56.3

Table 1 shows that fertilizer was the most accepted and adopted technology by the farmers, with adoption rate of 94.4%. This was followed by herbicide, improved seed, tractor and insecticide with adoption rate of 67.6%, 60.6%, 53.5% and 43.7% respectively. The high level of adoption of inorganic fertilizer (94.4%) may be attributed to its positive effect on rice yields. Since most of the farmlands are considered infertile or degraded due to continuous cropping (Ukeje, 2002). Although the innovation of using inorganic fertilizer has been greatly adopted by the farmers, yields recorded were still low and may be attributed to inadequate supply of the commodity due to high purchase prices, untimely supply and ineffective services to educate farmers on the use of the innovation packages efficiently in their production. Although the innovation of using inorganic fertilizer has been greatly adopted by the farmers, yields recorded were still low and may be attributed to inadequate supply of the commodity due to high purchase prices, untimely supply and ineffective extension services to

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The moderately high adoption rate of use of tractor (53.5%) may be due to its efficiency in pulverisation of the soil, incorporation of organic matter and in weed control which promotes plant growth.

The high level of adoption of herbicide (67.6%) may be attributed to its efficiency in the reduction of the cost of hired labour and also minimizes drudgery and fatigue associated with mechanical or manual labour. Improved seed increase yield per hectare of land and also farmers income, and may be the reason for its high adoption rate (60.6%). The low adoption of insecticide (43.7%) may be attributed to the lack of noticeable cases of insects attacks on the farmers crops.

B. Determinants of Adoption of New Technology

Table 2. Distribution of farmers on the basis of credit facilities.

Credit Source	Adoptors		Non-Adoptors	
	No.	Percentage (%)	No.	Percentage (%)
Agricultural banks	11	15.5	60	84.5
Commercial banks	1	1.4	70	98.6
Friends/relatives	4	5.6	67	94.1
Farmers society	7	9.9	64	90.1
Non-beneficiaries from any source	48	67.9	-	-

Table 2 showed that majority of the farmers (67.6%) were non-beneficiaries of credit facilities from any of the credit sources which may be attributed to lack of collateral security, high interest rate charged by the banks, lack of awareness, complex procedures in processing loans, etc. While very few of the farmers are beneficiaries from agricultural banks, commercial banks, friends/relatives and farmers' society with 15.5%, 1.4%, 5.6% and 9.9% respectively.

Inadequate working capital hinders small-scale farmers to

expand their scale of operations and/or take advantage of profitable packages of technology to boost productivity. The bulk of capital injection by this category of farmers comes from owners' equity (67.6%). The long and cumbersome bureaucratic processes might have prevented the flow of credit through the government established credit schemes and commercial banks to the farmers. These may invariably affect farmers' desire to adopt improved agricultural technologies.

Table 3. Distribution to farmers on the basis of their educational level and adoption of agricultural innovations.

Educational Level	Adoptors		Non-Adoptors	
	No.	Percentage (%)	No.	Percentage (%)
Non-formal education	2	3.8	10	52.6
Adult education	3	5.8	4	21.1
Primary education	1	1.9	3	15.8
Secondary education	12	23.1	1	5.3
Tertiary education	34	65.4	1	5.3
Total	52	100	19	100

Table 3 shows that 3.8% of the adoptors of improved technology had no formal education, while 5.8%, 1.9% and 23.1% had adult, primary and secondary education respectively. Majority of the adoptors (65.4%) attended tertiary education, while majority of the non-adoptors (52.6%) had no formal education. Among the non-adoptors 21.1%, 15.8%, 5.3% attained adult, primary, secondary and tertiary education respectively.

Low level of education of small-scale farmers who form the bulk of the agricultural labour force has remained a major constraint to the adoption of modern farming techniques and their inability to access other inputs necessary for increased productivity in the sector (Ukeje, 2002). Educated farmers can gather reliable information through such media as the newspapers, gazettes, handouts, posters, radio, televisions, etc.

Table 4. Distribution of Farmers on the Basis of Contacts with Extension Agents

Farmers visited and benefited from the visit		Farmers visited but not benefited		Farmers not visited at all	
No.	Percentage (%)	No.	Percentage (%)	No.	Percentage (%)
29	40.8	2	2.8	40	56.3

Table 4 shows that 56.3% of the farmers were not visited at all by the extension agents, while 40.8% were visited and benefited from the visit, and only 2.8% were did not benefited from the visit. Extension contact is very vital for effective adoption of technologies (Omotayo *et al.*, 1997).

Limited extension visit here may imply that farmers are not adequately informed about new agricultural innovations or are not persuaded to effectively put them into practice; this might affect their rate of adoption of improved technologies.

Table 5. Distribution of farmers on the basis of age and adoption of improved technologies

Age (yrs)	Adoptors		Non-Adoptors	
	No.	Percentage (%)	No.	Percentage (%)
15 – 34	19	38.8	2	9.1
35 – 54	26	53.0	6	27.3
Above 54	4	8.2	14	63.6
Total	49	100	22	100

Table 5 shows that 38.8% of the adoptors were within the age range of 15 – 34, while 8.2% were within the age range of 35 – 54 years above 54 years respectively. Conversely, 9.1% of the non-adoptors were within the age range of 15 – 34 years, while 27.3% and 63.6% were within the ranges of 35 – 54 and above 54 years respectively.

It can be concluded that the middle aged farmers had the highest percentage of adoption of agricultural innovations (53.0%) while the highest non-adoptors (63.6%) were the old aged farmers. Old aged farmers tend to be sceptical on improved innovations and are usually tied to their beliefs and norms.

Table 6. Distribution of farmers on the basis of sources of innovation packages

Sources of packages	No.	Percentage (%)
Market	66	93.0
Adamawa ADP	28	39.4
Cooperatives/Relatives	6	8.5
Non-users of innovation packages	2	2.8

Table 6 shows that 93.0% of the farmers obtained their innovation packages from the market, while 39.4% and 8.5% of the farmers obtained their innovation packages from Adamawa ADP and Cooperatives/relatives respectively. However, non-users of the innovation packages constituted only 2.8%.

Government efforts to develop efficient and effective input procurement and distribution system to farmers through the

Agricultural Development Programmes (ADPs) have not been successful. The persistence of this problem has been attributed largely to the issue of subsidy and its administration. Farmers prefer to go to markets where they can really access these packages regardless of the cost implications. The implication is that utilisation of these packages may not be efficient to guarantee output maximization.

IV. CONCLUSION

Agricultural innovations provide the means of achieving a sustained increase in farm productivity and income and consequently leading to better living standard. It has been revealed that the extent to which farmers adopt agricultural innovations in the study area was encouraging. However, the major problems of the innovations were the complexities of their usage and high cost of packages in markets. The chi-square results on distribution of farmers on the basis of their educational level and adoption of agricultural innovations shows that the adoption is dependent on the farmers level of education, that is, there is a correlation between level of education and adoption of new agricultural technology. This agrees with the findings of Osuji (1983). The results also indicated that the adoption of improved technologies is dependent on the farmers age and agrees with the findings of Pandey (1987) and Auta (1992) who reported that young farmers tend to be more flexible in their decisions to adopt new ideas readily, because of the anticipated longer life span within which the investment in new technology will pay off than the old age.

V. RECOMMENDATIONS

The approaches to fostering the adoption of agricultural innovations are recommended below: -

- i. Provision of effective agro-service centres by the government in rural areas for timely provision and delivery of farming in inputs to the rural farmers.
- ii. Provision of credit facilities through the rural banking scheme should be strengthened by making more funds available for loan schemes.
- iii. Supply of modern farm inputs at subsidised price should be done early, since agriculture is a time specific venture.
- iv. Farmers should be encouraged to form cooperative organisations in order to solve their problems collectively; this will make them share their knowledge on farm experiences.

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