

Adoption of Improved Rice Varieties among Small- Scale Farmers in Katcha Local Government Area of Niger State, Nigeria

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Abstract

The study broadly aims at providing information on the adoption of improved rice varieties among small-scale farmers in Katcha Local Government Area of Niger state, Nigeria. The study was conducted in 2007 cropping season. Data were generated from a sample of 100 farmers using questionnaire. Results indicated a high rate of awareness of improved rice varieties. The main sources of information were radio and extension agents. The major reasons for non-adoption of improved rice varieties are that they are expensive and non-availability of the input. The study recommends policies that would strengthen the existing media and extension services. Also, improved rice varieties and other input that could enhance farmers output be made available to the farmer at affordable prices.

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. 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. The definition of a small farm is obviously based on the size of the farm holding. Small farms are usually defined as those smaller than the average farm size at a provincial or national level. However, farm size alone is not always a good criterion for categorizing farmers. Farmers who own 1 ha of irrigated land are generally more prosperous than those who own 2 ha of land in a drought-prone area of low productivity. In most developing countries of Asia, the average land holding ranges from 1 to 2 ha (www.agnet.org/libraray/bc/44002).

In order to increase rice production in the country, the federal government has designed policies and programs aimed at boosting domestic production to meet domestic demand since 1989 (Idiong, 2005). These include amongst others, the Fadama Rice Programme, the Japanese

Assisted National Rice Production Project as well as the River Basin Development Rice Programme.

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 Cereals 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 among others.

The development of these improved rice varieties are aimed at increasing food production as well as 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. It is to this backdrop that the following research questions are asked.

What are the socio-economic characteristics of rice farmers in Katcha local government area?
What is the awareness and adoption of improved rice varieties in the study area?
What are the channels used for dissemination of new technologies to rice farmers?
Is rice production profitable?

The aim of this study was to examine the awareness and adoption of improved rice varieties in the study area.

METHODOLOGY

Area of Study

This study was carried out in Katcha Local Government Area (LGA) of Niger state. Niger state lies between latitude 8° 21' and 110 30'N and longitudes 3° 30 'and 7°20'E. It is situated in the middle belt zone of Nigeria and is indispensably one of the largest fertile agricultural lands in Nigeria covering about 8,733, 170 km² of the total land area of the country. It is characterized with distinct wet and dry seasons. With a population of over 3 million (National Population Census, 2006), over 80% of this population engage directly or indirectly in agricultural activities. The major crops cultivated in the study area are; rice and guinea corn. While maize, millet and groundnut are produced as minor crops. Farmers in this area are mainly fishermen. Livestock farming is also practiced with sheep, goats, cattle and poultry reared mostly on free range.

Data Collection

A combination of purposive and simple random sampling techniques was employed for selection of respondents for the study. Five major rice producing villages were purposively selected from the local government area which are Katcha, Kasha, Ndayagi, Sabon Gari and Gbakeko. Twenty farmers from each of the five villages were selected using the random sampling procedure, making a total one hundred farmers. Data used for this study were primarily generated with the use of questionnaire and interview schedule administered on the respondents. The data were collected during the 2007 cropping season.

Data Analysis

Frequencies and percentages were used to achieve the first and second objectives, while farm budgeting technique was used to achieve the third objective. The budgeting tool was used to determine the Net Farm Income (NFI). Net Farm Income, according to Olayide and Heady (1982), Olukosi and Erahbor (1988) is expressed as $NFI = TR - TC$; where:

NFI = Net Farm Income (₦/ha)

TR = Total Revenue (₦ /ha)

TC = Total Cost (₦ /ha)

GM = TR - TVC; where:

GM = Gross Margin (₦ /ha)

TR = Total Revenue (₦ /ha)

TV = Total Variable Cost (₦ /ha).

The depreciation on value assets was determined using a straight line depreciation method.

RESULTS AND DISCUSSION

The Socio-Economic Characteristics of The Respondents

The socio-economic profile of respondents result from the study shows that a typical farmer sampled was male 39 years old, married with a household size of 11 people. The average farm size was 1.5 hectares (Table 1).

TABLE 1: Socio-economic Characteristics of the Respondents

Variables	
Male	100
Married	100
Average age (years)	39
Average household size(number)	11
Average farm size (ha)	1.5

Awareness and Adoption

Awareness is the first stage of technology adoption (Akanya, 1990; Adeniji 1996). A farmer has to know about new innovation before adopting it. Table 2 shows that majority (78%) of the respondents are aware of improved rice varieties and have adopted it, while 22 percent of the respondents claimed to be ignorant about improved rice varieties. This is similar to the findings of Chinaka *et al* (2007) on adoption of improved agricultural technologies by farmers in Aba agricultural zone, Abia state. There is a gap between awareness and adoption of innovation. Adeniji (1996) observed that the use of recommended farm innovations by farmers was less than the knowledge of innovation. Similar results were reported by Adeniji (2007).

TABLE 2: Respondents Level of Awareness and Adoption of Improved Rice Varieties

Improved rice production	Aware%	Not aware%	Adopted%	Not adopted%
Improved rice varieties	78	22	71.79	28.21

Sources of Information on Improved Rice Varieties

The sources of information through which the respondent first heard about improved rice varieties includes Radio, Extension agents, Television and Pamphlets. Table 3 shows the various sources of information to farmer on improved rice varieties. It shows that 56% of the farmers received information through the radio. Twenty eight percent (28%) identified extension agents as the main sources of information. Other sources identified were television indicated by 10% of the respondents while 6% identified pamphlets as the major source. This finding is contrary to the study on adoption of improved cotton production technologies in Katsina State, Nigeria by Adeniji, (2007) which showed that the extension agents were the major channel through which farmers receive information on improved practices. The high response to radio, was popular because most farmers have radio or were able to listen to farming programs. Radio is equally one of the fastest means of communicating with generality of farmers. This disagrees with the findings of Voh (1981) and Adeniji (1996) who found radio as the second source of information after extension agents. The insignificant impact of Television and Pamphlets may be due to low income and low educational level of respondents.

TABLE 3: Sources of Information on Improved rice Varieties in Katcha Local Government area of Niger State

Channel	Frequency	Percentage
Radio	56	56
Extension Agents	28	28
Television	10	10
Pamphlets	6	6
Total	100	100

Reasons for Adoption

In order to determine the relevance of the technology, reasons for adoption were asked. Table 4 depicts that 92% of the respondents adopted improved rice varieties to obtain more yield and income, 21% adopted because it matures early, while 10% adopted in order to have long grain rice which is more marketable than short grain. The highest proportion of the respondents did so to obtain high yield and subsequently to have their income raised. This agrees with Clark and Akinbode (1968) who reported that financial gain and high yield are the apparent reason why farmers adopted recommended practices.

TABLE 4: Respondent's Reasons for Adoption

Reasons for adoption	Frequency	Percentage
To obtain more yield/income	92	92
Early maturity	21	21
Long grain (more marketable)	10	10
Total	123	123

**More than sample size due to multiple responses*

Reason for Non-Adoption

The reasons for non-adoption of improved rice varieties is presented in Table 5.

All the respondents (100%) reported that improved rice varieties are expensive coupled with the need to adopt other technologies that could enhance the yield of rice. Eighty six percent of the respondents complained that the improved varieties are not readily available.

TABLE 5: Respondent's Reasons for Non- Adoption of Improved Rice Varieties

Varieties	Frequency	Percentage
Expensive	22	100
Not useful	3	13.64
Not readily available	19	86.36
Inadequate knowledge	12	54.54
Late information	6	27.27
Total	112	282

**More than number of non adopters due to multiple respondents*

Costs and Returns To Rice Production

Farm budgeting analysis, using the net farm income method was employed in the study. The profitability of any business can be deduced from the relationship between the costs incurred in running the farm business and the returns accruing to it (Adegeye and Dittoh, 1985). The result of the farm budgeting analysis (Table 6) revealed that the major components of the variable costs are cost of labour (55.42%) and inputs (32.75%). The high percentage of inputs could be attributed to the fact that majority of the farmers bought the inputs from the open market. This is similar to the observation made by Kudi (2000) in his study on costs and returns analysis of carrot production in two local government areas of Kaduna state. The study also revealed that fixed cost was very small (7.12%). This is in agreement with the findings of Alamu *et al* (2000), Kudi (2000) and Sani *et al* (2003). The gross margin of the farm per hectares per production season stood at N84, 750.00, while the net farm income realized was found to be N80, 230.00. The average yield per hectare is 23 bags which is equivalent to 1,840 kg.

TABLE 6: Average Cost and Returns Rice Production /Hectare (N) in Katcha Local Government Area, Niger State, 2007

Details	Average Value (N)/ha	Percentage
Yield (kg)	57,500.00	
Price (N/kg)	31.25	
Gross income	143,750.00	
Fixed Costs (FC)		
Depreciation on hand tools	500.00	0.79
Rent on Land (N /Season)	4000.00	6.30
Total Fixed Cost (TFC)	4500.00	7.12
Variable Cost (VC)		
Labour (family/hired) N	35,200.00	55.42
Inputs (seed fertilizer/agrochemical)N	20,800.00	32.75
Other costs (transportation, storage)	3000.00	4.72
Total Variable Cost (TVC)	59,000.00	92.88
Total Cost(TC)=(TVC+TFC)	63,520	
Gross margin (GI-TVC)	84,750.00	
Net farm Income (GI-TC)	80,230.00	

CONCLUSION AND RECOMMENDATIONS

The study shows that rice farmers are aware of improved rice varieties. The main sources of information were radio and extension agents. The major reasons for non-adoption of improved rice varieties are that they are expensive and non-availability of the input. Therefore, there is a need for promotion of media and extension services to enhance the adoption of this technology.

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