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Full Length Research Paper

Analysis of adoption of improved maize varieties among farmers in Kwara State, Nigeria

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The study focuses on the analysis of socio-economic factors that influence the adoption of improved maize varieties among farmers. The specific objectives are to identify the available new maize varieties in the study area, sources of information on new maize varieties, determine the extent to which the farmers are aware of the improved maize varieties, the influence of socio-economic characteristics of the farmers on adoption of improved maize varieties and to identify the problems confronting farmers' adoption of new maize varieties. Data was obtained from fifty (50) maize farmers through the use of structured questionnaires. The data collected were analysed using descriptive statistics and regression analysis. It was found that more than half of the respondents (sixty percent) were aware of the improved maize varieties and have been using them, while fifty four percent of the respondents got their information from extension agents. All the respondents (100%) were aware of the improved maize varieties. The results of the regression analysis showed that household size, level of education, contact with extension agents, and access to credit and yield of the improved maize varieties were the factors that influence the adoption of improved maize varieties. The major constraints identified were high cost of fertilizer and cost of labour, lack of capital, lack of contact with extension agents and lack of market for produce. It is recommended that cost of fertilizer should be subsidized, efforts should be made to make credit accessible to farmers, and there should be increased number of extension agents who would help introduce new maize varieties to farmers and an effective input supply system that would sustain the expansion of maize output by farmers in the study area should be put in place.

Key words: Improved maize varieties, regression analysis, socio-economic factors, Nigeria.

INTRODUCTION

Maize is an important food and feed crop in Nigeria and remains an important crop for rural food security. The production of the crop must be increased in order to ensure food and income security through the development of improved maize varieties and technologies. Maize is a staple food of great socio-economic importance in developing countries and it has a wide range of uses these include; baking, brewing industries and livestock feed. It is an important source of carbohydrate, protein, iron, vitamin B, and minerals. Green maize (fresh on the cob) is eaten parched, baked, roasted or boiled; playing an important role in filling the hunger gap after the dry season and serving as a staple diet for 200 million people (Directorate Agricultural Information Services in cooperation with ARC-Grain Crop Institute, 2003), while in developed countries, maize is consumed as second-cycle produce in the form of meat, eggs and dairy products. The importance of maize cannot be overemphasized, with Nigeria producing 43% of maize grown in West Africa. Maize is the most important staple food in Nigeria. It accounts for about 43% of calorie intake (Nweke et al., 1983; NARP, 1994). Maize has consumption quantity of 53.20 g/capital/day (FAOSTAT, 2007).

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Table 1. Distribution of respondents according to contact with extension agents.

Extension contact	Frequency	Percentage
Yes	38	76
No	12	24
Total	50	100

Table 2. Distribution of respondents with respect to access to credit.

Access to credit	Frequency	Percentage
Yes	40	80
No	10	20
Total	50	100

According to FAO data, the area in which maize was planted in West and Central Africa alone increased from 3.2 million hectares in 1961 to 8.9 million hectares in 2005. This phenomena expansion of the land area devoted to maize resulted in increased in production from 2.4 million metric tonnes in 1961 to 10.6 million metric tonnes in 2005. In Nigeria, between 2004 and 2007, the quantity of maize produced ranged from 5,567,000 tonnes to 7,800 tonnes (FAO, 2008).

Production per hectare is still very low (1.3 tonnes per ha) in most developing countries. The poor performance in the agricultural sector has led to decline in agricultural production and overall low economic growth. This has called for the intensification of agriculture through development of improved varieties and production technologies (FAO, 1986).

Maize production in Nigeria has not been sufficient enough to meet the needs of people and livestock. Supply has not been able to meet demand despite the introduction of improved packages (Babatunde et al., 2008).

This study attempt to identify the available new maize varieties in the study area. The sources of information on new maize varieties, determine the extent to which the farmers are aware of the improved maize varieties, the influence of socio-economic characteristics of the farmers on adoption of improved maize varieties and the problems confronting farmers' adoption of new maize varieties.

METHODOLOGY

The study was conducted in Oke-Ero Local Government Area of Kwara State. The Local Government Area is located on latitude 8° to 9° North and longitude 3° to 4° East of the equator. The Local Government Area has a population of 57,619 (Census, 2006).

The area lies in the southern Guinea Savanna zone with alluvial and hydromorphic soils. The average annual rainfall ranges from 1,000 mm to 1,500 mm. The rainfall duration is about 6 months, beginning from April and ends in October. The dry season begins in October and ends March. The maximum temperature ranges between 30 to 38°C. The Local Government Area has 10 wards, namely Ilofa, Odo-Owa, Idofin- igbana , Ekan- Meje, Ilale, Emiunope, Ilemona, Imoda, Isare- Opin, Ayedun. From the ten wards, two wards were purposively selected, namely Odo –owa and Idofin –Igbana and 25 farmers who grew improved maize varieties were randomly selected from each ward making a total of 50 farmers. Data was collected with the aid structured questionnaire and data analysis was done using descriptive statistics and multiple regression analysis. Regression analysis shows the relationship between dependent and independent variables. The linear regression model was used to identify factors influencing the adoption of improved maize varieties by farmers. The functional form fitted was specified as:

$$Y = + {}_1X_1 + {}_2X_2 + {}_3X_3 + {}_4X_4 + {}_5X_5 + {}_6X_6 + {}_7X_7 + {}_8X_8 + e$$

Where
Y = Adoption of improved maize varieties
= Constant
e = Error term
$_1$- $_8$ = Coefficients
x_1 = Age of head of household (years)
x_2 = Household size (number of household members)
x_3 = Level of formal education (years spent in school)
x_4 = Extension contact (measured in terms of frequency of visits of the extension agents to farmer and vice versa)
x_5 = Farming experience (years)
x_6 = Forms of land tenancy (Inherited =1, Rent = 2, Purchased =3) x_7 = Total output of farmer (Kg)
x_8 = Availability of credit (Yes =1, No =0)

RESULTS AND DISCUSSION

Farmers contact with extension agents

The result in Table 1 shows that seventy six percent of the farmers had contact with extension agent, while twenty four percent had no contact with extension agent. This implies that the more the contact with the extension agents the more the adoption rate. This result is in line with the findings of Obeta and Nwagbo (1991), which revealed that frequent contact with extension agent is likely to minimize doubts among farmers and ensure timely purchase of inputs.

Farmers' access to credit

The result in Table 2 indicates that eighty percent of the respondents had access to credit, while twenty percent had no access to credit. The data shows that there is that tendency that farmers will adopt new innovations because majority of them had access to credit which would enable them to purchase inputs and pay for labour required in the adoption of new varieties.

Available new maize varieties in the study area

The result in Table 3 indicates that sixty percent of the

Table 3. Distribution of respondents according to maize variety cultivated.

Improved maize variety cultivated	Frequency	Percentage
DMRESR-Y	30	60
DMRESR-W	20	40
Total	50	100

Table 4. Sources of information on new maize varieties.

Information source	Frequency	Percentage
Extension agent	27	54
Other farmers	17	34
Friends	3	6
Radio	3	6
Village/ward head	0	0
Total	50	100

Table 5. Distribution of respondents according to awareness of new maize varieties.

Extent of awareness	Frequency	Percentage
Yes	50	100
No	0	0
Total	50	100

Table 6. Distribution of respondents according to problems preventing the adoption of new maize varieties.

Problems encountered	Frequency	Percentage
High cost of fertilizer	12	24
High cost of labour	1	2
Lack of capital	24	48
Lack of contact with extension agent	1	2
Lack of market for produce	11	22
No response	1	2
Total	50	100

respondents cultivated “DMRESR-Y” (yellow), while forty percent cultivated “DMRESR-W” (white). This analysis revealed that DMRESR-Y is the most common improved maize varieties adopted in the area.

Sources of information on new maize varieties

Farmers obtained information on improved maize varieties from radio, extension agents, other farmers, village/ward head, and friends’. The result in Table 4 revealed that fifty four percent of the respondents got their information from extension agent, thirty four percent from other farmers, six percent from friends and radio respectively. This analysis revealed that majority of the respondents (54%) got information on improved maize varieties through extension agents. Therefore, the extension agents are the key sources of information on the improved technology. Thus, the more the farmers have contact with extension agents, the more tendency of adopting the technology. This in turn would lead to increase maize productivity.

Extent of awareness and adoption of new maize varieties

The result in Table 5 revealed that all the farmers in the two wards were aware of the improved maize varieties. The analysis in Table 6 shows that sixty percent of the respondents cultivated one maize variety, while forty percent (40%) grew two maize varieties.

Factors influencing adoption of new maize varieties

The result of the regression analysis in Table 7 revealed that five variables were found to be significant in relation to the adoption of the new maize varieties. These variables include household size, level of education, farming experience, access to credit and yield of the improved maize varieties.

The household size was significant at 5% level of probability with negative coefficient which indicates that there is a negative relationship between household size and adoption of improved maize technology. The larger family size the lower the level of adoption of improved maize varieties. The coefficient of educational status was positive and highly significant at 1% level of probability. This implies that there is a direct relationship between adoption of improved maize varieties and educational status, indicating that as educational status increases, adoption level also increases among farmers. These findings are inline with that of Clark and Akinbode (1968), Alao (1971), Atala (1980) and Okwoche (1998).

The coefficient of farming experience was also positive and significant at 10% level of probability. This implies that farmers acquire more experience as the rate of adoption of new varieties increases. Access to credit also had a positive coefficient and was significant at 1% level. This indicates that adoption of improved maize varieties increase as farmers’ access to credit increases. That is, they are likely to have adequate capital for the procurement of inputs such as fertilizer, improved seeds chemicals and payment for labor required in the use of the new technology. Hence, the level of adoption of improved maize varieties increases as farmers have

access to credit. These findings are in line with that of Lawal et al. (2004).

The variable yield was also found to be positive and highly significant at 1% level of probability. Thus, increase in yield will lead to increase in adoption of new maize variety by the farmers. Yield is a direct measure of seed's performance, and a crop variety that is high yielding stands to be adopted by farmers since high yield would raise output and gross earning. This finding is inline with the finding of Adesina and Seidi (1995) that reported that yield significantly influenced farmers' decision to adopt improved mangrove swamp varieties of rice in Sierra Leone.

Problems confronting farmers in adoption of new maize varieties

Problems faced by farmers in the adoption of the improved maize varieties are represented in Table 8. The result in Table 8 shows that forty-eight percent of the respondents lack capital, while twenty four percent of the respondents reported that there is high cost of fertilizer which prevented them from using some of the improved maize varieties, while twenty two percent were of the view that lack of market for produce was a major constraint that hinders them from adopting the improved maize varieties. The analysis also revealed that two percent of the respondents were of the view that high cost of labour hinders them from adopting the improved maize varieties. Similarly two percent of the respondents admitted that they lack extension contact prevent them from adopting the technology.

CONCLUSION AND RECOMMENDATIONS

The study revealed that all the farmers were aware of the improved maize varieties available and the most important sources of information on the improved maize varieties were extension agents and other farmers. The regression analysis revealed that the most important variables that influence adoption of improved maize varieties were household size, level of education, and contact with extension agent, access to credit and yield of the improved maize varieties.

Based on the findings of this study, the following recommendations are proffered:

1. Cost of fertilizer should be subsidized, since high cost of fertilizer prevented farmers from using some of the improved maize varieties.
2. Efforts should be made to make credit accessible to farmers, since lack of capital was an obstacle to the adoption of the improved maize varieties.
3. There should be increased in number of extension agents who would help introduce new maize varieties to farmers since there was a significant relationship between extension contact and adoption of improved maize varieties.
4. The significant relationship between maize yield and adoption of improved maize varieties indicates that an effective input supply system that would sustain the expansion of maize output by farmers in the study area should be put in place.

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