

FACTORS INFLUENCING ADOPTION OF RESEARCH RESULTS AND AGRICULTURAL TECHNOLOGIES AMONG COCOA FARMING HOUSEHOLDS IN OYO STATE, NIGERIA

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ABSTRACT

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Cocoa Research Institute of Nigeria (CRIN) is mandated to develop, improve and translate appropriate research results and post-harvest agricultural technologies to farmers (end users) and the general public on Cocoa, Coffee, Kola, Cashew and Tea. This study was conducted at Oyo State of Nigeria during May and June 2007 to determine (1) rate of adoption of technologies developed by CRIN and (2) factors which promote adoption of these technologies. A semi-structured questionnaire was administered to obtain information on gender, age, level of education and knowledge on sources of new innovations, adoption and benefits of technologies. Results showed that 73% of the farmers interviewed didn't adopted the technologies. The 27% adopters who were casual workers on CRIN plantations worked or had a link with technical staff than non-adopters. All adopters were below 60 years and 80 % had at least primary level education. The significant determinants of adoption of research results were age of farmer and visit by CRIN scientists. Access to credit, participatory approaches to research and regular training/ visits on use of technologies were found to be also important for adoption of technologies.

Keywords: Technology adoption, credit, participatory approach, education

INTRODUCTION

Agriculture is the backbone of the economy of Nigeria and it employs over 75% of the population. This sector has also recorded the growth rate well above 5% in recent years compared with the less than 2% growth of early 80's (Falusi, 2008). Due to high population pressure, farms and farmlands have become smaller and fragmented. However, this population growth has outstripped agricultural output growth thus the issue of food security and low agricultural productivity. This issue is viewed as a result of low adoption of agricultural research results and technologies that can increase farmers' productivity. The rate of adoption of technology is very low due to the expected benefit or net-returns that may or may not result from the practice (Uwatt, 1997; Ayoola, 1990). There is therefore the need to intensify efforts on adoption of research results/technologies for improved productivity, food security, sustainable development and farmer welfare through adoption of superior technologies and research packages. The Cocoa Research Institute of Nigeria (CRIN) has the mandate to develop, improve and translate research results on improved technologies into practice among farmers and manufacturers in order to improve production and socio-economic life of the people. The institute consists of six research stations all over the country with headquarters in Ibadan, Oyo State, Nigeria and has developed many research results, packages and technologies. However, the adoption rate of these packages /technologies seem to be very low, hence low and discouraging returns to farmers.

Considering Oyo State of Nigeria, Cocoa was introduced first in 1890 at Olode and the rest introduced at Akinyele both in Ibadan before it started to spread to other parts of the state. The State covers an area of approximately 2.79mha area of land out of which 332,667.3ha can support cocoa production. 174,986ha is under cultivation out of which 24,852ha need to be replanted and 54,800ha rehabilitation. Oyo State produces 37,904mt annually from 75,000- 85,000 effective hectares (Oyo, 2005)

The objectives of this study were to determine (i) the rate of adoption of technologies developed by CRIN, (ii) finding the factors which promote or limit the adoption of technologies and (iii) to give recommendations on ways to encourage the adoption of these results/ technologies.

METHODOLOGY

This study was conducted at Oyo State of Nigeria during 2007 where the Headquarter of Cocoa Research Institute of Nigeria (CRIN) is located. In Oyo states, there are thirty three Local Governments Areas (LGAs) of which only 19 are Cocoa growing. Out of the 19 cocoa growing LGAs, 4(four) were chosen for coverage of this study, these are Oluyole, Ona-Ara, Ido and Akinyele. The LGAs surround CRIN headquarters and technologies/ research results are always filtered and disseminated to the area and farmers. Within the four LGAs, the study sample consisted of 94 households. A regression equation was put up to determine the factors responsible for adoption of research results and technologies as:

$$Y=f(X_1, X_2, X_3, X_4, X_5, e)$$

Where

Y = adoption of CRIN research results and technologies

X₁ = sources of information

X₂ = educational status of farmers

X₃ = Age of farmer

X₄ = visit by CRIN scientists

X₅ = social network/ association among farmers

The number of households interviewed per LGA was: Oluyole (28), Ona-Ara (26), Ido (18) and Akinyele (22). These were selected randomly with the help of the LGA's agricultural officers and biased towards farmers who have been engaged in CRIN fields as unskilled / casual laborers, ex-staff, those who have benefited from CRIN services one way or the other.

Semi- structured questionnaires were administered to gather necessary data. Information collected includes socioeconomic characteristics, information and sources of modern agricultural research results /technologies, adoption of technologies and their benefits. In addition, information on factors promoting / contributing to adoption of these technologies was obtained. The data collected were analyzed using both descriptive and inferential statistics.

RESULTS AND DISCUSSION

All except one of the farmers interviewed have knowledge on the research results and agricultural innovations especially on rehabilitation techniques, soil/ site selection and fertilizer regimes, (plant geometry) appropriate planting density , appropriate use of insect ices and improved planting materials. The farmers acquired information from personal observation on the CRIN fields, visit by extension officers, visit to CRIN demonstration plots in the headquarters and farmers' exchange of information during their social network meetings. About 73% of the farmers interviewed have not adopted the technologies listed above. Of the 25 adopters, 72% have been sensitized on the advantage of the research results and technologies, while 89% of the non-adopters of technologies and results have not been sensitized. Therefore, sensitisation on new research results and technologies through visits by technical staff and discussion during farmers meetings appear to be related to the promotion of adoption of technologies. So also is the participatory approaches which involve all stakeholders from research design stage to result stage are important for quick adoption of research result. This is in line with Lion Berger (1960) who asserted that technical information is needed by farmer in the adoption process. Also, Almekinders and Elings (2003) stated that participatory approaches and collaborative ways to research ensure that researches are solving farmer problems and hence results from such a process is taken /adopted with ease. Sensitization was through formal short-term training during LGA farmer's meetings, exhibition stands and visits by agricultural technical staff. Generally, adopters recorded more farm visits by agricultural officers than the non-adopters. About (62) 66% of farmers interviewed have visited demonstrated plots. Of these, (52)84% and 59% are classified as adopters and non-adopters respectively. Therefore, exposure to technology and research results through visits to demonstrations mounted by CRIN extension staff seems to have no influence on adoption for farmers because primarily the problems being solved did not emanate from them and is not solving/dealing with their dare needs and problems.

The majority of the respondents were between 31 and 60yrs old. All adopters of research results and technologies were below 50years. This finding that young farmers are more receptive than the old ones is similar to reports of a previous study carried out elsewhere (Croppenstedt and Demeke, 1996; Nyilimbibi, 1977). About 16% and 77% of the farmers interviewed have no formal education and primary school level of education, respectively. Results for this study also showed that 80% adopters have primary or post primary education. This is also in line with past reports by (Chambers, 1994) that lack of formal education was considered as the main factor for the non-adoption of innovation.

About 85% of the households interviewed were headed by men. It was also observed that all adopters of research result/technologies belong to households headed by men although the proportions of female headed households are small in the sample. Most of the farmers (98%) were informed of the benefits of the research results and technologies and specifically listed increased yield and productivity, low input prices, increased income, sustainable agricultural development as the benefits. To promote adoption of these technologies the

farmers emphasize the need to be involved in research design (90%), to have access to credit (55%) and proper training on how to use the technologies (22%). The regression result showed that

$$Y = 481.49 + 6.10X_1 - 99.08X_2 - 67.05X_3^* + 0.66X_4^* + 4.36X_5$$

(3.845) (119.95) (19.501) (0.045) (17.456)

$$R^2 = 0.796 \quad F = 51.64$$

Figures in brackets are standard errors

* significant at 1% level of probability

The result shows that all independent variables except educational status and age of farmers have negative signs; however, age and visit by CRIN scientists have significant effects on adoption of research results and technologies.

CONCLUSION AND RECOMMENDATIONS

Since a positive relationship exists between visit by CRIN scientist and adoption, this implies that the higher the number of visits by scientists to the farmers the more the research results will be adopted and consequently higher productivity leading to improved welfare. Also the negative but significant Age of farmer can be attributed to the fact young farmers are more receptive than older ones as the older ones are not always ready to part with the old techniques for new ones. Furthermore, factors which promoted the adoption of agricultural research results and technologies developed and disseminated by CRIN included sensitization on the advantages of the technologies, literacy, age, technical information and exposure to the technology.

In addition, there is the need to involve farmers and start participatory approach to CRIN research (more farmer-oriented and collaborative) so that the farmers' problems can be tackled by research and also the need for farmers to have access to credit to enable them take up the new challenges. There is also the need for the empowerment of the Socioeconomic, Statistics and Techno-economic Programme in CRIN with the aim of linking the institute to farmers' needs, aspirations and the consideration of farmers as important partners in a whole agricultural development process for sustainable research results adoption and also improve research-extension-farmers' linkages. Also there is the need to encourage farmers to increase/improve their stock of social capital by participating in farmers' association or group as this can also influence their adoption of technologies and access to other services that may improve their welfare as also stated by Cramb, 2005.

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