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Analysis of the Determinants of Training Workshop on Natural Rubber in Nigeria

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ABSTRACT Determinants of training workshop on natural rubber technologies were studied by selecting 51 participants invited for training workshop at Rubber Research Institute of Nigeria (RRIN) main station Iyanomo. Data collected were analysed using descriptive statistics, multiple regression analysis and Z- test statistic at 5% probability level. The result indicated that males dominated the training; all of the participants were literate and had one form of formal education or the other. Z- test analysis shows a significant relationship between pre- and post training score. Result of the multiple regression analysis showed that the postulated regressors explained about 70.40% of the variations in the regressand. The entire estimated coefficients carried the expected positive sign, which indicated that an increase in these variables would lead to increase in the knowledge of trainees on rubber innovation. Education, depth of coverage, calibre of facilitators and practical exercises/ field visits were the major determinants of training workshop and have significant effects on training at various probability levels. It is thus recommended that regular training workshop should be conducted for capacity building of end users in the rubber industry in Nigeria.

INTRODUCTION

Natural rubber (*Hevea brasiliensis)* production statistics show that Nigeria has a total of 247,100 hectares of land under rubber cultivation mostly owned by small-scale farmers (Kpolo 1999; Aigbekaen et al. 2000; Delabarre and Serier 2000). Remarkable improvements have been made in the breeding of high yielding clones of rubber by the Rubber Research Institute of Nigeria as RRIN adapted (exotic) clones and RRIN developed clones having latex yield of 900 to 1600 kg per hectare per year of dry rubber and 2000 to 3000 kg per hectare per year respectively (Alika 1982; Omokhafe and Nasiru 2004). Natural rubber is one of Nigeria's most important industrial and export crop, which provides employment opportunity and serves as foreign exchange earning for the country. Products from tapping of natural rubber are useful in the automobile industries for the manufacture of tyres and tubes; surgical gloves used in medical fields are obtained from latex (Abolagba et al. 2003).

The introduction of intercropping of immature rubber plantation with arable crops and minilivestock integration after canopy closure was also developed for efficient use of resources among rubber farmers. The practice has been found to be agriculturally compatible, economically feasible and has social acceptability especially the introduction Snailery under matured plantation. The introduction of innovation would only make impacts if disseminated and adopted by end users. Agriculture has witnessed scientific revolution that makes the process of technical change much more knowledge intensive. This calls for transforming farmers through education. Extension experts are of the view that education is a catalyst in technology adoption. Technology transfer might be achieved through training workshop. Training is aimed at enhancing the agricultural self-development capacity of the farmers, imparts skills to stakeholders, raises level of technical knowledge of participants, improves capacity building and raises level of farmers' professionalism to enable them take greater responsibility and become more autonomous in decision making (Coen et al. 1992; Giroh et al. 2004). Training creates an avenue for information exchange and developing synergy between participants. This would lead to spontaneous diffusion as farming communities share results with friends and spread innovation. It is in the realization of this that National Agriculture Research Institutes in Nigeria (NARIs) adopted training workshop as a strategy for technology transfer to achieve their mandates. Okwoche et al. (2007) emphasized the need for

adequate number of trained and skilled personnel as the basic resource for successful extension delivery. Substantial training effort is needed to upgrade the skills, knowledge of farmers and changed agents. Skill training prepare trainees for accelerated agricultural technology transfer and utilization, knowledge and skill gained at any training are best evaluated by the use of test at the end of training (Mosher 1966; Williams 1978).

This study is therefore conducted to evaluate determinants of training workshop on natural rubber technologies. The specific objectives are: to describe socio- economic characteristics of participants; evaluate the contribution of variables such as education, depth of coverage of workshop; calibre of facilitators, level of participants' interaction, duration of workshop, schedule of activities and workshop management and practical exercises/ field visit on training workshop and to evaluate facilities / support services for training workshop.

METHODOLOGY

The study was conducted at Rubber Research Institute of Nigeria Main station Iyanomo (latitude 6^0 and 7^0 N, longitude 5^0 and 6^0 E). The Government of the former Western Region of Nigeria established the Institute in 1961 as part of its Ministry of Agriculture and Natural Resources. On the creation of Mid Western Region in 1963, the Institute became the Rubber Research Station of the Ministry of Agriculture of the new Region. Following the enactment of the Nigerian Research Institute Act of 1964 and the promulgation of the Agricultural Research Institute Decree of 1973, the Federal Government took over the organization of Rubber Research Institute of Nigeria. The Rubber Research Station at Iyanomo Benin City and Akwete were amalgamated to constitute the Rubber Research Institute of Nigeria, with headquarters and main station at Iyanomo and substation at Akwete.

As a result of the reorganization of Research Institutes by the Federal Ministry of Science and Technology between June 1986 and April 1987, RRIN has been expressly given the following mandate:

To conduct research into: genetic improvement of rubber and other latex producing plants; improvement of agronomic practices, including planting, cultivation and harvesting techniques; processing, preservation, storage and utilization of rubber producing plants; development of control measures for pests and diseases of rubber producing plants; design and fabrication of simple implements and equipment for rubber production and processing; farming systems in relation to cultivation of latex producing plants; socio-economic problems of their cultivation and utilization and any other problems related to rubber production, processing and utilization. The institute is also mandated to: carry out extension liaison with relevant Federal and State Ministries, primary producers, industries and other users of research results in connection with rubber production, processing and utilization in collaboration with National Agricultural Extension Research and Liaison Services (NAERLS); organize technical and vocational courses in areas relevant to the above; provide laboratory and other technical services to farmers, agro based industries and others needing these services and the Institute is also mandated to collaborate with all other relevant research institutes and organization in carrying out its mandate. A new mandate has also been added to the Institute to cater for Gum Arabic studies located at Gashua in Yobe State. There is also an out station in Igbotako in Ondo State and a substation at Akwete, Abia State. The main station occupies 2,078 hectares of land (Giroh 2007a).

A total of 51 participants invited for a training workshop on Nursery Management and Budding techniques organized by the Institute in collaboration with Federal Department of Agriculture (FDA) in September 2001 formed sample for the study. Variables of interest to study such as gender, education were captured on arrival at the training workshop. A pre and post evaluation of the workshop was achieved through the use of a forty (40) multiple choice question administered prior to the commencement of training and after training for pre training score and post training score which were recorded for each participant. The forty multiple-choice questions addressed areas such as budding techniques (15), plantation establishment (8), nursery management (12) and incidence of pest and diseases (5). Another set of questionnaire was administered to participants for the evaluation of the workshop. The questions raised were depth of coverage, duration of workshop, level of participants' interaction, calibre of facilitators, practical exercises/ field visits and schedule of activities. A three point score was adopted for rating of responses: 3 highest, 2

medium and 1 lowest. Participants and their responses on the support services and facilities for the training were also obtained.

Data collected were analysed using descriptive statistics (frequency and percentages); inferential statistics (Z – test statistic and multiple regression analysis).

The multiple regression postulated for the participants in the study area is implicitly presented by Equation (1)

$Y = f(X_1, X_2, X_3, X_4, X_5, X_6, , X_7, ì_1)$.....(1)

where:

Y = Knowledge index (Scores after evaluation in marks)

X_1 = Education (measured in years spent in school)

X_2 = Depth of coverage of workshop

X_3 = Calibre of facilitators

X_4 = Level of participants interaction

X_5 = Duration of workshop

X_6 = Schedule of activities and workshop management

X_7 = Practical exercises/ field visit

μ_1 = the error term (was assumed to have zero mean and constant variance).

Four functional forms (Linear, Semi - log, Exponential and Cobb-Douglas) were tried using ordinary least square technique (OLS). The estimated functions were evaluated in terms of the statistical significance of R^2 as indicated by F – value, the significance of the coefficients as given by the t – values, the signs of the coefficient and the magnitude of standard errors. Based on these statistical, economic and econometric criteria, the exponential functional form was selected as the lead equation which is explicitly represented Equation (2)

$$LogY = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \beta_7 X_7 \quad (2)$$

Where β_0 = A constant, β_1, β_2 …. β_7 are regression coefficients to be estimated while other variables are as previously defined.

RESULTS AND DISCUSSION

Result in Table 1 indicated that majority of respondents are males while female participation in the training was low as compared to their male counterpart. The low involvement of females in many agricultural activities in Nigeria may be attributed to socio- cultural factors not as a result of managerial and technical inefficiencies (Enete et al. 1995). For instance land inheritance rights in many Nigerian communities alienated the women folk but favoured men and it is also observed in the extension activities which are male dominated. Thus government policy should encourage the involvement of women in agricultural and other economic activities to utilize their potentials. The respondents are all educated. Education has been found to be a critical variable in innovation dissemination and adoption. The educated the farmers are the better they take wise decisions concerning their farm and other enterprises.

The impacts of training on the knowledge of participants were evaluated using Z- test statistic and the result is presented in Table 2. There was a significant relationship between pre and post training score. This implied that participants have gained more knowledge about rubber innovations at the end of the training than prior to the commencement of the training This result in line with the earlier reports of Williams (1978) who stated that testing participants or trainees at the end of any training is a useful tool for measuring knowledge gained at training.

Result of the multiple regression analysis presented in Table 3 indicated that the estimated

Table 1: Distribution on the basis gender and education of participants

Variable	*Frequency*	*Percentage*
Gender		
Male	40	78.43
Female	11	21.57
Total	51	100.00
Educational Qualification		
Primary	3	5.90
Secondary	10	19.60
OND	15	29.41
HND/B.Sc	21	41.17
M.Sc.	2	3.92
Total	51	100.00

Source: Field survey, 2001.

Table 2: Z- test analysis on evaluation of training workshop

Variable	*No. of observation*	*Mean*	*Standard deviation*	*Standard error*	*Mean difference*	*Critical Z*	*Z calculated*
Pre training score	51	19.09	5.27	0.0072	6.79	1.96	15.08**
Post training score	51	25.88	5.31	0.0074			

Table 3: Result of multiple regression analysis

Parameter	*Coefficient*	*Standard error*
Intercept	1.749**	0.678
X_1	0.062***	0.012
X_2	0.089*	0.045
X_3	0.116**	0.053
X_4	0.008	0.048
X_5	0.005	0.093
X_6	0.013	0.099
X_7	0.036**	0.015
F	7.016***	
R^2	0.733	
R^2 Adjusted	0.704	

Data analysis 2008.
*, **, *** (Significant at 10,5, 1 percent).

R^2 value showed that the postulated regressors explained about 70.40% of the variations in the regressand in equation (2) while the F – value indicated that the estimated multiple regression was significant at the 1.0% level. The entire estimated coefficients carried the expected positive sign, which indicated that an increase in these variables would lead to increase in the knowledge of trainees on rubber innovation.

The coefficient of X_1 (education) carried a positive sign is statistically significant at one percent and is consistent with apriori expectation. Education is a critical factor in any training as participants are educated, it is easier to impart knowledge to them and the learning process (transformation) becomes easier. This result is in line with the findings of Giroh et al. (2007b) who found out that education was significant with adoption of rubber innovation among farmers in the rubber belt of Nigeria. Farmers with more years of formal schooling tend to be more efficient in production presumably due to their enhanced ability to acquire technical knowledge (Amaza et al. 2001; Umoh 2006; Tanko et al. 2007). Depth of coverage of training workshop (X_2) was significant at ten percent probability level. Adequate coverage of topics for training has relationship with the calibre of facilitators (X_3) which is also significant. This implies that resource persons invited to deliver skill development lectures are subject matter specialists who are competent to handle the topics chosen for the training workshop. Extension delivery programmes and activities are patterned towards professionalism as developed by Benor and Baxter (the training and visit; T&V system) in 1984. It is widely adopted in Nigeria. The resource persons (subject matter specialists, SMSs) are integral components in the communication channels. The coefficient X_7 (practical exercises / field visits was another determinant of training workshop on natural rubber innovations or technologies which is statistically significant. This afforded the participants to practically demonstrate what was taught and to equip them technically. Most agricultural innovations are usually characterized by observability, triability and with the use of field visits, participants are shown how to raise rubber nurseries, plantation management, budding and budding techniques, diseases and pest control and tapping. Practical exercises/ field visit is similar to method demonstration, which is the process of showing farmers how to perform a particular agricultural practice. It is to enable farmers to learn by doing. Okwoche et al. (2007) reported that method demonstration was one of the most effective methods of teaching farmers.

Evaluation of support services and facilities provided for the workshop is presented in Table 4. From the table majority of participants rated them a s very good. These facilities also provided conducive atmosphere that are believed to enhance learning process in many formal and informal forms of education.

Table 4: Distribution of respondents based on evaluation of support services and facilities

Support services/ facilities	*Response*	*Frequency*	*Percentage*
Audio-visual aid	Very good	24	47.06
	Good	18	35.29
	Poor	9	17.65
Class room facilities	Very good	27	52.94
	Good	24	47.06
	Poor	-	0
Catering services	Very good	30	58.82
	Good	21	41.18
Transportation	Poor	-	0
	Very good	26	50.98
	Good	22	43.14
Workshop	Poor	3	5.88
	Very good	33	64.71
	Good	18	35.29
	Poor	-	0

CONCLUSION

The study revealed that education, calibre of facilitators, depth of workshop coverage and practical exercises/ field visits are the major determinants of training workshop and have positive influence on the learning process on innovations of natural rubber. Males dominated

the training. There was also a significant relationship between pre and post training score, indicating knowledge gain at the end of training than at the beginning of the training. It is therefore recommended that regular training workshop should form focus of the government for capacity building of all stakeholders in the natural rubber industries. This could be achieved through collaborative efforts in funding of research by government, non-governmental organization and other end users of research results on natural rubber.

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