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Evaluation of Implementation Accuracy of Natural Rubber Technology among Contact Farmers in the Farm Settlements of Edo and Delta States, Nigeria

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Abstract: This study evaluated the implementation accuracy of natural rubber technologies in the farm settlements of Edo and Delta States of Nigeria. . Copies of structured interview schedules were administered on 60 contact farmers randomly selected. Data collected were analysed using descriptive statistics and chi-square statistics. Findings of the study revealed that majority of contact farmers are old, educated and characterized by large family size and are small-scale rubber farmers. Significant difference existed between implementation accuracy and education, family size and farm size at 5% probability level using Chi - square test statistic. It was however recommended that moiré young farmers should be encouraged to participate in rubber cultivation.

Key words: Implementation accuracy % Rubber technologies % Chi- square % Rubber belt % Nigeria

INTRODUCTION

Natural rubber (*Hevea brasiliensis*) is the best source of plant because of its singular ability to renew its bark and thus ensure sustained harvest. Food and Agriculture Organization (FAO) [1] reported that unselected or local clones of rubber has yield of 300 to 400 kg per hectare per year of dry rubber. Williams *et al.* [2] suggested the use of improved productivity of rubber by introducing clone rubber trees instead of traditional seedlings with low yield potentials. Considerable research has been conducted on the natural rubber in the areas of crop improvement and other production innovations 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 [3-5] According to National Agricultural Research Projects (NARP) [6]. RRIN developed clones are one of the best yielding clones in the world. The introduction of intercropping with arable crops before canopy closure ensures effective utilization of the avenues and labour for maintenance. The intercropping can be practiced during the first 2 to 3 years, provided the crop is not too near the line of rubber plants. It has been observed that the multiple cropping in the vast inter row of young rubber plantation holds key to attracting small holders to rubber farming due to the long gestation period of rubber [7]. It has been found to be economically feasible in that the farmer obtains revenue from the sales of the crops while waiting for the maturity of the trees before the commencement of tapping. Similarly, when canopy closes, integrated farming (mini livestock, apiculture, rearing of bees can be introduced). Rubber production in Nigeria is mainly from small holder farmers [8,9]. These various technologies that have been developed for the crop and have been adopted by farmers and have contributed to improved practices and increased yields by farmers. In spite of this, wide gaps still exist between the yield farmers get on their farms and the yields obtained by researchers in their stations. Given this gap, questions could be asked in the area of appropriatness of the technologies taught or disseminated to the farmers and the degree of accuracy of the implementation of the recommended technologies. Windapo [10] stated that information on technology comes from researchers to extension agents through subject matter specialists. Farmers are also reached through the extension agents. These constitute communication chain of Research-subject matter specialist-extension-contact farmers. Accuracy of information will be reduced as information passes

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through the above chain. When information gets to the contact farmers, his /her characteristics may influence the farmers' utilization and implementation. Eponou [11] posited the wide recognition of the linkages between research and its partners namely extension services and farmers are rather poor and it is also acknowledged that this is one of the reason of poor agricultural technology in Africa.

In the context of this study, the following terms are explained: Recommended practices-specific practices that farmers are taught by extension agents. They are standard acceptable practice in the area. Knowledge-implementation accuracy refers to the degree of confluence between knowledge possessed by farmers and their field implementation of such knowledge and a contact farmer is a farmer formally selected by the agricultural agent for delivering messages to and to adopt new agricultural technology she/ he has adopted in his or her farm. The contact farmer is expected to diffuse information on new technology to non- contact farmers. The objective of the study was to evaluate contact farmers accuracy of knowledge implementation of natural rubber technologies. The specific objectives are to investigate the relationship between contact farmers socio-economic characteristics (family size, education and farm size) and their implementation accuracy of natural rubber technology.

Research Hypothesis: There is no significant relationship between contact farmers socio- economic characteristics and their implementation accuracy of the recommended practices. Assumption: The study assumes that:

- Farmers in the area have adopted the natural rubber technology and other recommendations taught by RRIN
- That other factors (weather, input availability, labour and other conditions are held constant and
- The information that gets to the farmers from RRIN is accurate.

MATERIALS AND METHODS

Three farm settlements in the traditional rubber-growing zone of Nigeria, namely Iguoriakhi, Mbiri and Utagba-Uno farm settlements in Edo and Delta States respectively were selected for the study. These farm settlements were set up by the government to promote production of tree crops such as rubber and oil palm. Random sampling technique was used to select a total of 70 rubber farmers. The choice of these farm settlements stemmed from the fact that the areas served as contact centres for most of agricultural innovation.

Dependent variables were measurement by responding appropriately to questions on implementation accuracy. This consisted of direct field observation on what had been practiced or done. It involved finding out the degree to which the types and amount of farm inputs used, practices carried out by each respondent. It also involved counting, pacing of field and identifying types of planting materials used. Scoring system similar to Oparo [12] and Windapo [10] was adopted. A correct field implementation recommendation was awarded one (1) and zero (0) for an incorrect implementation. Maximum implementation score was fixed at 100%, after summing up for all elements of the package of recommendations. With this procedure, each farmer was assumed to have implementation score ranging between zero and one hundred. Based on Dipeolu and Akinlola [13], the process can be represented symbolically after slight modification to suit the purpose of this study as:

$$Y_i = 3\ (Tni/Tn)\ .\ 100 \qquad (1)$$

Where:

Y_i = Number of recommended packages of the ith farmer (%),

Tni = Number of innovations adopted,

Tn = Total innovations and are analysed with the independent variables.

RESULTS AND DISCUSSION

Socio-Economic Characteristics of Contact Farmers: Table 1 shows socio- economic characteristics of contact farmers (age, education, family size, farm size and experience). From the table, majority of the contact farmers are old. This is a threat to the natural rubber industry as their productivity is likely to decline thereby resulting to lose in hectares of rubber cultivated. Younger rubber contact farmers should be encouraged to cultivate natural rubber by providing them land and other production inputs for self-employment generation. Studies have shown that the elderly people provide labour for natural rubber production. Majority of the contact farmers (80%) have between 5 to 10 family size, which could serve as labour requirement for agricultural and non agricultural activities. However, this could lead to the depletion of resources meant for production to non-agricultural

Table 1: Selected socio-economic characteristics of farmers in technology use

Variable	Number	Percentage
Age		
# 30	4	6.67
31-40	13	21.67
41-50	14	23.33
51-60	12	20.00
>61	17	28.33
Education		
No. Education	2	3.33
Primary	46	76.67
Secondary	7	11.67
OND	3	5.00
B.Sc. / HND	2	3.33
Farm Size (ha)		
# 1.5	25	41.67
1.6-2.5	30	50.00
>2.5	5	8.33
Family size		
1-5	41	35.37
6-10	29	25.00
>11	46	39.63
Experience (Years)		
# 5	18	30.00
6-10	30	50.00
>11	12	30.00

Source: Field survey, 2007

Table 2: Relationship between contact farmers education, farm size and family size and implementation accuracy

	Implementation score		X^2	
Variables	# 33	> 33	X^2cal	X^2tab
Education				
No. Education1	(1.67)	1(1.67)	12.35	9.48
Primary	19(31.67)	37 (61.67)		
Secondary	4(6.67)	3(5.00)		
OND	0(0.00)	3(5.00)		
B.Sc./ HND	1(1.67)	1(1.67)		
Farm Size (ha)				
# 1.5	17(28.33)	8(13.33)	8.76	5.99
1.6- 2.5	13(21.67)	17(28.33)		
>2.5	0(0.00)	5(8.33)		
Family size				
1-5	11(18.33)	7(11.67)	10.40	5.99
6-10	18(30.00)	12(20.00)		
>11	1(1.67)	11(18.33)		

Source: Field survey, 2007

activities. There is high preponderance of the educated contact farmers and this implies that adoption would also be easy. Majority of the contact farmers are small scale farmers.

Relationship Between Contact Farmers Socio-Economic Characteristics and Implementation Accuracy: Table 2 shows the implementation accuracy of the contact farmers. There were positive relationship between education, farm size and family size and the implementation accuracy Education is a critical factor in the implementation of innovation. The result supports the works of Aribisala [14] and Lowe [15] who stated that education is necessary so that there are innovative farmers and educating the farmers would make the works of extension workers easier in transforming the farmers. Education facilitates the adoption of new technologies by farmers, allow farmers to read instructions on labels of chemicals. Farm size was significant with implementation accuracy. Farm size imposes the necessity to implement any improved practices. This shows that the bigger the land size, the most likely the farmers will adopt and implement recommended practices. The significant relationship between farm size and adoption supports the finding of Okoye [16] who observed significant relationship between farm size and adoption of innovations. Policy will thus encourage the allocation of land for rubber production in Nigeria. Family size was significantly related to implementation accuracy of rubber contact farmers .This may be as a result of the fact that members of such families are educated and can help in educating their parents on agricultural technologies.

CONCLUSION

The study revealed that contact farmers are old, educated and is small-scale rubber farmers. Education, family size and farm size have significant relationship with rubber technology implementation accuracy.

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