

EVALUATION OF THE EXTENSION PROGRAMME OF NJALA UNIVERSITY COLLEGE SIERRA LEONE

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ABSTRACT

The purpose of the study was to evaluate the effectiveness of the extension programme of Njala University College. Operationally, the study assessed the farmers' adoption level of the agricultural innovations introduced to them, determined their socio-economic characteristics and how these were related to the adoption behavior of the programme participants. Two hundred farmers drawn randomly from six chiefdoms were involved in the study. Data analysis revealed that there was a positively significant relationship between innovation adoption by the participants and farm size, years of schooling, decision making type, cosmopolitaness, land tenure, aspiration to change farm size and number of farm enterprises, number of information sources used and awareness of agricultural innovations.

The programme strategy, that is, the trickle down adoption through the non-participants had not been appreciably noticeable in terms of technology transfer from the former to the latter. The participants' farm size, income, social participation, extension contact, number of information sources used, awareness of agricultural innovations, and positive attitudes toward the extension programme were significantly higher than those of the non-participants. The non-participants within the programme area, however, experienced the programme's spill-over effect more than those non-participants outside the programme area.

Lack of credit, shortage of extension agents, and limited number of tractors were discovered as some of the problems confronting the farmers. The study concluded with the following recommendations; a) a review of the extension strategy to extend activities to those farmers who have not benefitted from the programme, b) encouraging group action among farmers,

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c) re-emphasizing extension contact by increasing the strength of the present field staff and d) assisting farmers in getting credit and the timely supply of inputs such as fertilizers and improved seeds.

Introduction

Sierra Leone's agriculture, like those of other less developed countries, play a vital role in overall economic development of the nation. Farmers constitute about 80% of the population who depend mainly on agricultural production as a means of subsistence. Among other problems, the development of inappropriate and inadequate agricultural technology and its transfer has contributed to the relatively unsatisfactory performance of the agricultural sector. The establishment of various extension organizations and the financial support given by government is a counter move to mitigate this unwholesome situation. However, the inability of these organizations to create necessary impact on farmers and the lack of any formal evaluation of their programmes pose a lot of problems on efficient agricultural development.

Before the inception of Njala University College (NUC), the extension services of Sierra Leone were mainly the responsibility of the Ministry of Agriculture. After its establishment in 1964, NUC was engaged in carrying out extension services in cooperation with the Ministry of Agriculture throughout Sierra Leone. In 1968, however, the Ministry allocated to NUC the area within 20 miles radius of the institution to serve as a testing ground for research and services related to agricultural extension. As almost two decades have gone the authors of this study felt it necessary for a broad assessment of the progress that has been achieved. The mere existence of the extension programme of NUC for sixteen years up to the time of this study indicates that a sizeable proportion of government and university resources have been directed toward the support of the programme's activities. Accordingly, the major problem of the study was the lack of knowledge of the impact of the various extension activities embarked upon by NUC in some rural communities in Sierra Leone. Important data on the farmers reached, their characteristics, adoption rates of agricultural innovations had been lacking.

The objectives of the study are:

1. To assess the degree of awareness and adoption of the various agricultural innovations introduced to the farmers through the extension programme of NUC
2. To assess the degree of extension contact between the NUC field extension staff and the farmers who took part in the extension programme.
3. To identify the various channels of communication through which the rural farmers of the study are learned about improved agricultural practices.

4. To assess the degree of contact between those who participated in the extension programme of NUC and those who did not.
5. To determine the socio-economic characteristics of farmers who took part in the extension programme of NUC and how these are related to their adoption of recommended farm practices.
6. To determine the attitudes of farmers toward the extension service.
7. To derive implications from the above findings for agricultural development through the extension programme of NUC.

Hypotheses Tested

Because of the paucity of information on the relationship between adoption of agricultural innovations and many of the variables included in this study under Sierra Leone conditions, the following hypotheses were stated in the null form:

Ho1. There is no significant relationship between adoption of recommended farm practices and family characteristics of farmers who participated in the extension programme of NUC.

Ho2(a). There is no significant relationship between contact of local programme participant leaders with participant non-leaders in the extension programme of NUC and the adoption level of the latter.

Ho2. There is no significant relationship between the contact of non-participants with the programme participants in the extension programme of NUC and the adoption level of the former.

Ho3. There is no significant difference between the participants and non-participants in the extension programme of NUC in terms of their family socio-economic characteristics.

Ho4. There is no significant relationship between attitudes of the programme participants toward the extension service and the number of recommended farm practices they adopted.

Theoretical Background and Conceptual Framework

A large body of literature exists on evaluation particularly on rural community programmes, but a few of them have examined the impact of such programmes on the targets in terms of change in knowledge, attitude and behaviour. The few studies that have done this have seen change in knowledge, attitude and adoption, as important indicators of programme effectiveness. In this relationship, positive attitudes towards the programme can lead to more learning, and more knowledge that is acquired through learning, the better the decisions taken for adopting recommended farm practices. A number of these studies have viewed the purpose of evaluation

as essentially one of determining the behaviour of the clientele being taught, and the degree to which changes in behaviour are actually taking place (Tyler, 1969; Janelid and Rio, 1973). According to Wheeler (1969) evaluation concludes about the success or failure of an educational programme by assessing change in behaviour. This involves forming judgements about programmes through comparative evidence of "What is" with criteria of "What should be" and making judgements which could be utilized in decision making to improve programme operations (Steele, 1970).

Adoption of recommended farm practices by farmers as an indicator of programme effectiveness could be influenced by a number of factors. One of such key factors is effective communication. Williams (1971) is with the opinion that without effective communication, coordinated efforts towards common goals are impossible. To emphasize this point further, Akibode (1970) holds the view that effective extension work can only result through a thorough understanding of the barriers which hinder communication between extension workers and their clientele. He suggests the use of various extension methods as a counter move for successful extension work, but cautioned that some of these methods are more effective than others under certain situations.

An evaluation of a rural community programme of Iowa State in terms of change in behavior of the people (adoption of a weed spray and an antibiotic feed supplement for hogs) revealed that certain sources of information used by clientele are more important at some stages of adoption than others (Beal and Rogers, 1970). An evaluation of the Italian shell company in terms of physical evidence indicated a clear and considerable increase in the income of farmers as a result of the programme intervention (Virone, 1954). Physical evidence, particularly income is extremely important in evaluation. Without physical evidence, the farmers are likely to show great resistance towards other changes. Tyler (1969) opines that evaluation is a process of determining the extent to which programme objectives are realized. In short, Tyler says evaluation is the process of determining the value of anything.

Some of the transactions to consider in evaluation that must have contributed to programme objectives include instructional materials such as innovations used, the nature and availability of the innovations, instructional techniques and supportive strategies (Stake, 1967). Such activities in a rural development programme normally aim at setting targets, improving knowledge, situations, attitudes and social and economic standards of target groups. The outcomes expected from the transactions include production, adoption, income changes, trained leaders, extension contact, social participation and their social and economic implications.

A study of the characteristics of the neighbouring communities and the impact of the Isoya Rural Development Project (IRDP) in Nigeria revealed that programme impact was significantly related to the number of wives assisting in farm work and contact of farmers with IRDP Staff from the

University of Ife (Jibowo, Alao and Williams, 1975). A similar impact study of a university based extension programme in Ghana revealed that programme cooperators had the tendency to grow improved variety of corn more often than the non-cooperators (Dumor and Amonoo, 1973). A study of the farmer motivation patterns for participation in the ACRE Project zones of Sierra Leone discovered average age, farming experience, farm size, farm income, family labour level and level of education to be slightly higher among ACRE Project farmers than the non-participant farmers. The study also revealed that the project farmers with slightly higher socio-economic characteristics adopted more recommended agricultural innovations from the project than the non-contact farmers (Bangura, 1981).

Apart from the socio-economic factors discussed above, a number of infrastructural and institutional factors also play a prominent role in determining the effectiveness of agricultural extension programmes. Among these factors are poor transport facilities, lack of production incentives for farmers such as credit and high prices for produce, lack of market, lack of adequate farm land and shortage of extension staff. This study also examines the part played by these factors for the effective transfer of agricultural innovations to the farmers of the extension programme of NUC.

Methodology

A stratified sampling technique was used to select respondents from the target populations. Since the objective of the study was to evaluate the effectiveness of the extension programme of NUC in the target region, it implied not involving programme participants only. Two chiefdoms outside the programme zone were randomly selected and added to those four chiefdoms that constitute the programme zone. The target population within these six chiefdoms was then stratified into three categories, viz.: a) programme participants b) non-programme participants within the programme zone and c) non-programme participants outside the programme zone. Ninety-six programme participants, sixty-four within non-participants and forty-eight external non-participants were selected at random making a total of two hundred and eight respondents of which two hundred were interviewed. Eight were unavailable during visit time.

Data were collected during September and October of 1984 by face-to-face interview using questionnaire. Data analysis involved the use of simple statistical techniques like frequency counts, percentages, means, weighted means scores and standard deviations. To determine the relationship between adoption of recommended farm practices and the socio-economic characteristics of the farmers, the Pearson's Product Moment Correlation Coefficient was used. A two-way analysis of variance (ANOVA) was used to determine significant differences among the means of the programme participants, within non-participants and the external non-participants in terms of their socio-economic characteristics and attitudes towards the extension

services. Chi-square test was used to determine relationship between adoption and the nominal variables (aspiration and land tenure) which could not be tested using correlation and ANOVA.

Variables

The dependent variable in this study is adoption, and it is defined as the acceptance and use of any of the agricultural innovations introduced to the farmers' through the extension programme of NUC. The variable is operationalized as the frequency count of the practices accepted and incorporated into the farmers' farming operations. The independent variables include the socio-economic characteristics of the farmers and their attitudes towards the extension programme of NUC.

Findings

Respondents Socio-Economic Characteristics

Table 1 gives a summary of the farmers' socio-economic characteristics. As seen from this Table, the majority of the farmers were in their production stages between 41–60 years of age with an average age of 50 years. The average farming experience was 26 years with more non-participants reporting longer experiences than programme participants. The programme participants reported more years of schooling than the non-participants. Generally, a high level of non-formal education was envisaged among the farmers.

The average size of the farm families was 10. The tendency to keep larger families appeared more among programme participants than non-participants. The average farm size was found to be 7.3 acres with the majority of the farmers cultivating below 6 acres. Only the programme participants cultivated above 15 acres; hence they had the tendency to cultivate larger farms. The majority of the farmers engaged in secondary occupations such as carpentry, trading, tailoring, teaching, chieftaincy and blacksmithing. Because of the semi-dependence on farming, the farm work did not take most of the farmers' time. Asked whether they used labour outside the family, the majority said they hired temporary labour even though this was reported to be scarce and expensive.

Most of the farmers operated family owned land while very few operated personal or rented land. There was the potential for farmers to expand their present holdings if they so desired because the majority said land was not a production constraint. Hence no restrictions were imposed on the farmers with regard to the type of crop to grow on acquired land for cultivation. About 73% of the programme participants aspired to increase their acreages under cultivation while very few non-participants opted to decrease their farms. None of the farmers aspired to decrease the number of farm enterprises already pursued. The majority of them said they had no plans to change the size of enterprises.

TABLE 1. Summary of the Respondents' Socio-Economic Characteristics

	Programme Participants(N=95)		Within Non- Participants(N=60)		External Non- Participants (N=45)	
	Frequency	%	Frequency	%	Frequency	%
AGE						
31-40	12	18.9	7	15.0	4	11.1
41-50	40	42.2	32	53.3	21	46.7
51-60	25	26.3	12	20.0	15	33.3
61-70	18	12.6	9	11.7	5	8.9
NO.OF YEAR OF SCHOOLING						
1-5	5	5.3	8	13.3	2	4.4
6-10	17	17.9	6	10.0	3	6.7
11-15	21	22.1	1	1.7	—	—
FAMILY SIZE						
1-6	10	10.5	20	33.3	11	24.4
7-12	53	55.8	26	43.3	26	57.8
13-18	21	22.1	14	23.4	8	17.8
19-24	11	11.6	—	—	—	—
FAMILY SIZE(ACRES)						
5 and Less	38	40.0	35	58.3	25	55.6
6-10	27	28.4	20	33.3	15	33.3
11-15	17	17.9	5	8.4	5	11.1
16-20	8	8.4	—	—	—	—
21-25	5	5.3	—	—	—	—
SOURCES OF LABOUR						
Family Labour	91	98.8	52	86.7	38	84.4
Hired Temporary Labour	73	76.8	38	63.3	28	62.2
LAND HOLDING RTGHT						
Personal Land	18	19.0	7	11.7	5	11.1
Family Land	67	70.5	45	75.0	32	75.1
Community Land	10	10.5	2	10.0	7	15.6
Rented Land	—	—	2	3.3	1	2.2
DIVERSITY OF FARM ENTERPRISES						
1-2	29	30.5	24	40.0	11	24.4
3-4	43	45.3	18	30.0	23	51.1
5-6	19	20.0	13	21.7	8	17.8
7-8	4	4.2	5	8.3	3	6.7
INCOME(LEONES)						
51-450	33	34.7	36	60.0	29	64.4
451-650	54	56.9	19	31.7	13	28.9
651-850	8	8.4	5	8.3	3	6.7

TABLE 1. (Continued)

	Programme Participants(N=95)		Within Non- Participants(N=60)		External Non- Participants (N=45)	
	Frequency	%	Frequency	%	Frequency	%
SOCIAL PARTICIPATION (Original Membership)						
0-3	24	25.3	35	58.3	26	57.8
4-7	57	60.0	25	41.7	19	42.2
8-11	14	14.7	—	—	—	—
DECISION MAKING TYPE						
Fully Shared	68	71.6	46	76.7	34	75.6
Partially Shared	22	23.1	9	15.0	8	17.8
Individual	5	8.3	3	6.6	—	—
ORIENTATION TOWARD COSMOPOLITENESS						
Favourable	12	12.6	5	8.3	3	6.7
Neutral	2	2.1	1	1.7	2	4.4
Unfavourable	81	85.3	54	90.0	40	88.9
ORIENTATION TOWARD COOPERATIVE ACTIVITY						
Favourable	35	36.8	10	16.7	4	8.9
Neutral	13	13.7	9	15.6	10	22.2
Unfavorable	47	49.5	41	68.3	31	68.9

Farm enterprise diversity had a mean of 3.5 with the majority of the farmers operating 1-4 enterprises. The average income of the farmers was reported to be Le468 per annum. Only 8% of the farmers reported income of more than Le650 per year. Programme participants reported higher income per annum than the non-participants. Social participation was found to be highest among programme participants than non-participants. Sixty percent of the participants participated in 4-7 social organizations whereas 58.3% and 57.8% of internal and external non-participants participated in less than 4 organizations.

"Fully shared" decision-making was reported the most common with respect to farm and home matters. Below 10% of the farmers in each of the three sample categories reported individual decision-making type.

About 85%, 90% and 89% of the programme participants, internal non-participants and external non-participants respectively showed an unfavourable orientation toward cosmopoliteness. Most of the farmers could only visit towns within their chiefdoms and district. Such visits were also seldomly made per annum. The majority of the farmers did not favour cooperative activity. The programme participants however had a greater

positive orientation toward cooperative activity than the non-participants.

Programme Impact

To assess the effectiveness of an extension programme one would no doubt have to find evidence of an appreciable impact the programme has had on its participant farmers. Since the programme was to promote the growing of rice and maize with the use of inputs (fertilizers, tractors etc.), it would seem quite logical to focus attention on the extent to which these inputs and services were utilized by the programme's activities on the non-participants.

Eventhough the participants had the tendency to grow improved maize varieties more often than the non-participants, the overwhelming majority in both categories grow local maize varieties. All the respondents grew rice. However, a relatively low percentage of them adopted improved rice varieties. About 91% of the programme participants used fertilizers as compared to 60% of the within non-participants and none of the external non-participants.

With regard to the use of mechanical services, only the programme

TABLE 2. Respondents Distribution According to Use Made of Selected Innovations

	Programme Participants (N=95)		Within Non- Participants (N=60)		External Non- Participants (N=45)	
	Frequency	%	Frequency	%	Frequency	%
IMPROVE MAIZE SEEDS						
Adopters	32	33.7	19	31.7	3	6.7
Non-adopters	40	42.1	22	36.7	35	77.8
IMPROVE RICE SEEDS						
Adopters	34	35.8	18	30.0	—	—
Non-adopters	61	64.2	42	70.0	45	100.0
FERTILIZERS						
Adopters	86	90.5	36	60.0	—	—
Non-adopters	9	9.5	24	40.0	45	100.0
USE OF TRACTOR						
Adopters	43	45.3	—	—	—	—
Non-adopters	52	54.7	—	—	—	—
RABBITS						
Adopters	5	5.3	—	—	—	—
Non-adopters	90	94.7	—	—	—	—
POULTRY						
Adopters	3	3.2	—	—	—	—
Non-adopters	92	96.8	—	—	—	—
COFFEE SEEDINGS						
Adopters	8	8.4	4	6.7	—	—
Non-adopters	87	91.6	56	93.3	—	—

participants (45.3%) hired tractors. The acreages ploughed were however between one two acres per farmer. A higher percentage of the farmers could not avail themselves of tractor services because of lack of money to hire the tractors ; non-availability of tractors and ; the limited land provided at five sites by the development unit¹. Hence, acreage demand did not justify the cost of tractor use, and consequently, the mechanization unit withdrew from rendering the services.

All the farmers indicated an overwhelming willingness to acquire farm loans but had no credit facilities. Virtually nothing significant was achieved in the adoption of innovations such as rabbit rearing, poultry keeping and coffee improvement. The General indication as shown in Table 3 was that farmers work more aware of innovations than they adopted. An average awareness of 11.6 innovations was reported. About 75% of the programme participants were aware of 12–17 innovations as compared with 33.3% and none of the internal and external non-participants respectively. The majority of the internal non-participants reported awareness between 6–11 innovations while only 17.8% of the external non-participants were aware of a maximum of 5 innovations.

The average adoption score was 7.25. About 70% of the participants adopted 6–11 innovations while 10.5% adopted 5 innovations and below. Some of the reasons for not adopting certain innovations as reported by the programme participants were inadequate money to buy inputs, lack of credit facilities, lack of adequated farm labour, lack of awareness and knowledge to use some innovations in that order.

TABLE 3. Awareness and Adoption of Agric, Innovations by Respondents

	Programme Participants (N=95)		Internal Non- Participants (N=60)		External Non- Participants (N=45)	
	Frequency	%	Frequency	%	Frequency	%
AWARENESS						
0–5	—	—	—	—	8	17.8
6–11	24	23.3	40	66.7	—	—
12–17	71	74.7	20	33.3	—	—
ADOPTION						
0–5	10	10.5	41	68.3	3	6.7
6–11	66	69.5	71	28.3	—	—
12–17	19	2	3.4	—	—	—

Extension Contact

The majority (50.53%) of the programme participants reported contacts with extension between 1 and 6 times in the previous three years, which when

¹ Development unit comprises the four chiefdoms within the programme zone and the implementing is situation Njala University College.

considered on annual basis is very low. The reason unearthed for such low visits was inadequate number of extension agents assigned to the Agricultural Economics and Extension Department. This problem was further compounded by the lack of transport facilities and other incentives such as travelling allowances. However, 32.6% of the programme participants reported contacts with extension agents between 7 and 12 within the past three years and 16.8% said they had contacts above 12 times.

To ascertain the "trickle down" strategy adopted by the programme administration, this study considered the extent of contact between programme participants and non-participants. Findings however revealed that this strategy had not been appreciably noticeable in terms of technology transfer from the former to the latter. Only 43.3% and 4.4% of internal non-participants and external non-participants respectively with programme participants. The frequency of such contacts reported contacts was however very low, while 69.2% of the internal participants who made such contacts said they never learnt about agricultural innovations during the contacts.

Sources of Information and Extension Teaching Methods.

The majority (77.9%) of the programme participants and 55% of the internal non-participants used between 4–8 sources of agricultural information. The average number of information sources used was 4.82%. About 66% of the external non-participants used below 4 sources as compared to 10.5% and 45% of programme participants and internal non-participants respectively.

Friends and neighbours were ranked as the most important sources of agricultural information followed by other farmers, NUC extension agents, salesmen and dealers and NUC Field Day. Local social organizations were ranked the poorest information source. The NUC agents were more important in the transaction of inputs such as improved maize and rice seeds, fertilizers and mechanical services. Home and farm visits rated as the highest methods of extension contact followed by result and method demonstrations, farmers' meetings, NUC Field Day, farmers symposia, training sessions and office calls, written materials and farm tours ranked the least used methods of contact.

Attitude toward the Extension Programme

Factors arising from human attitudes to new programmes were potent, and responsible for less extension contacts. The non-participants showed willingness to become programme participants if given the opportunity for reasons like getting the programme's benefit, improving their farms and increasing their income. However, the non-participants could be motivated by such reasons if they have evidence to believe that the participants in the programme were in fact benefiting. Seventy-eight percent of the non-participants could not ascertain the extent to which this attitude exists as

they were not aware of the benefits gained by the participants.

About 68% of the programme participants, 52% of the internal non-participants and 49% of the external non-participants showed favourable attitude toward the extension service. Also, 76% of the participants said the innovations introduced through the extension programme of NUC fitted well with their present farming operations.

Test of Hypotheses

H_1 . There is no significant relationship between adoption of recommended farm practices and selected family characteristics of the programme participants. The Pearson's Product Moment Correlation (r) was used where applicable to test the magnitude of linear relationship between each of the characteristics and adoption. The results are summarized in Table 4.

TABLE 4. **Relationship between Socio-Economic Characteristics and the Adoption of Recommended Farm Practices**

	r -Values
Age	0.165
Years of schooling	0.218*
Farm size	0.341*
Income	0.286*
Years of farming experience	0.047
Family size	0.405**
Diversity of farm enterprises	0.089
Social participation	0.293**
Decision making type	0.222*
Cosmopolitness	0.208*
Cooperative activity	0.079
Extension contact	0.531**
Number of information sources used	0.358**
Awareness of agric. innovations	0.480**

Degree of freedom = 93

r = coefficient of correlation

* = significant at the 0.05 level

** = significant at the 0.01 level.

The chi-square test revealed a significant relationship at the 0.01 level between land tenure and adoption. The test for aspiration in farming was split into two parts, viz. : aspiration to change farm size and aspiration to change the number of farm enterprises. Both the aspiration to change farm size and number of farm enterprises were significantly related to adoption at the 0.01 level of significance.

$H_2(a)$. There is no significant relationship between contact of the programme participant leaders and the rest of the participant farmers, and the adoption level of the latter.

H₂(b). There is no significant relationship between contact of programme participants and non-participants, and adoption level of the non-participants. These hypotheses were also tested using the Pearson's Product Moment Correlation Coefficient (r). The r -value for 'a' was 0.156 which was not significant at the 0.05 level using 79 degrees of freedom.

For the second hypothesis, the r -value for the adoption scores of internal non-participants and their contact scores with participants was 0.0185 while that for the adoption scores of external non-participants and their contact with participants was 0.0139. These two values were not also significant at the 0.05 level of significance using 59 and 44 degrees of freedom for internal and external non-participants respectively.

H₃. There is no significant difference among the participants and the two groups of non-participants in the extension programme of NUC in terms of selected socio-economic characteristic. The two-way analysis of variance (ANOVA) was used to test any significant variation among the means of the three sample categories with respect to their socio-economic characteristics where applicable. Where not applicable, chi-square test was used. The Least Significance Difference (LSD) test was used for comparing individual means in cases where the ANOVA test revealed differences among the means of the three sample categories. Table 5 is a summary of the ANOVA and LSD test respectively.

The programme participants had higher incomes and cultivated larger farms than the two groups of non-participants. The difference in farm size might have sprung from the difference in income because the participants with higher income could afford to pay for temporary hired labour to supplement their family labour and to procure farm inputs such as fertilizers and tractor services which their counterparts could not afford. The programme participants also participated in more social organizations, used more sources of agricultural information and had higher extension contacts than their non-participant counterparts. Similarly, the participants were aware of more recommended agricultural practices, adopted more of such practices than the non-participants, and had more favourable attitudes toward the extension service.

A chi-square test at the 0.05 level of significance using 4 degrees of freedom indicated a significant difference among the sample categories with regard to aspiration to change farm size.

H₄. There is no significant relationship between attitudes of the programme participants toward the extension programme and the number of recommended farm practices adopted. The Pearson's Product Moment Correlation Coefficient (r) was used to test this hypothesis. The r -value calculated was 0.347 which was significant at the 0.01 level. Hence the more favourable the participants' attitudes toward the extension service, the more recommended farm practices they adopted.

TABLE 5. Analysis of Variance Showing Difference among Means of Sample Categories with Respect to Family Socio-Economic Characteristics

	Programme Participants	Internal Non-Participants	External Non-Participant	F-Value	df
Age	50.65	49.33	50.17	0.11	2,6
Years of schooling	4.39	3.72	3.67	3.46	2,2
Farm size	8.53	5.07	5.78	28.31*	2,2
Income level	497.86	447.17	424.94	21.51*	2,4
Farming experience	26.70	27.42	26.13	4.26	2,4
Family size	11.58	8.90	9.10	2.58	2,6
Diversity of farm enterprises	3.46	3.47	3.63	-0.13	2,6
Social participation	5.08	3.17	3.19	21.81*	2,4
Decision-making type	19.76	19.04	18.98	3.13	2,4
Cosmopolitaness	17.03	16.93	16.45	-4.78	2,4
Cooperative activity	14.92	10.58	10.47	5.88	2,4
No. of information sources used	6.26	3.95	2.93	23.87*	2,6
Extension contact	7.48	3.58	3.50	25.07*	2,4
Awareness of innovations	12.33	8.50	0.44	21.58*	2,4
Adoption of innovations	9.07	4.27	2.50	26.71*	2,4
Attitude toward extension programme	60.55	44.92	41.43	28.52*	2,4

*Significant at 0.05 level.

TABLE 6. LSD Test for Characteristics Found to be Significantly Different Using ANOVA

	Programme Participants	Within Non- Participants	External Non- Participants	LSD =0.05
Farm size	8.53a	5.076b	5.786b	2.52
Income	487.8a	447.17b	434.94c	7.16
Awareness of innovations	12.98a	10.50b	2.50c	2.27
Social participation				
No. of information sources used	5.80a 6.26a	3.17b	3.19b 2.93b	1.53 2.21
Extension contact		3.95b		
Adoption of recommended practices	7.48a 9.07a	3.58b	3.50b	3.41 1.68
Attitude toward extension		4.29b	2.50b	
	60.55a	44.82b	41.436	7.20

*Means with common subscripts are not significantly different from each other.

Summary and Recommendations

In this study the programme participants reported more contacts with the NUC Field Extension staff while very few non-participant farmers were reached by extension agents. On the whole the frequency of such contacts

were low during the past three years. The participants contact with the extension staff from NUC was positively and significantly related to the adoption of recommended farm practices. These findings are in agreement with the more recent one in Sierra Leone (Bangura, 1983) and most other studies carried out in other parts of the world.

The "trickle-down" approach through programme participants to non-participants had not been appreciably effective in reaching the latter. Few non-participants had contacts with the programme participants. Further, the frequency of the contacts were virtually not meant for farming and extension related discussions. Hence the hypothesis that "the greater the contact between programme participants and non-participants, the greater the latter adopted recommended farm practices was rejected. Implicitly, the approach adopted by the extension programme of NUC had the tendency to favour large numbers of farmers, but discriminate against the small farmers in terms of achieving the programme's benefit. While statistical testing of the factors responsible for this situation was not done, it could be hypothesized that "information hoarding" by the participant farmers and the generally limited information requirement by subsistence farmers could have contributed.

Major sources from which farmers obtained information about agricultural innovation were through friends and neighbours, other farmers, NUC extension agents, salesmen and dealers, NUC Field Day and radio in that order. Local leaders, office calls and written materials rated as poor sources of agricultural information. The programme participants reported frequent use of these channels than the non-participants.

The participants' years of schooling, farm size, income, family size, social participation, family decision making type, cosmopolitaness, number of information sources used on improved agricultural practices, aspiration to increase farm size and number of farm enterprises and land holding right, were found to be positively and significantly related to adoption of agricultural innovations. The positive relationship between adoption and each of the above variables have been reported by many researchers in other parts of the world. A recent study by Abd-Ella *et al* (1981) found many of these factors to be significantly related to adoption.

The programme participants had better socio-economic status than the non-participants. That is, the participants had higher income, large farms, higher social participation, higher extension contact, more favourable attitude toward the extension service, used more sources of agricultural information and adopted more recommended farm practices.

On the basis of the above findings the following recommendations are suggested to improve the situation.

1. The programme participants as revealed in this study are in practice those farmers with higher levels of socio-economic status than the non-participants. With such high socio-economic characteristics, the programme

participants can be regarded as "progressive" farmers. The aim of the progressive farmer strategy which concentrates efforts of the extension agency on "progressive" farmers is not to favour the few but to make impact which is needed to spread the practices to the majority of the farmers most quickly (Bennor and Harrison, 1977). The "trickle-down" strategy through the programme participants to the non-participants which the extension programme of NUC adopted should be reviewed to ensure that those farmers who did not participate in the programme could be co-opted into future projects. Such a step is necessary since as a matter of fact the programme was designed to benefit the entire target population.

2. The main reason attributed to the low extension contact between farmers and the NUC extension agents was the limited number of field extension staff in the Department of Agricultural Economics and Extension. This compounded with the lack of transportation facilities had worsened the situation. In view of the important association between farmers' contact with extension agents and the adoption rate of the farmer, it is recommended that extension contacts be re-emphasised and strengthened by increasing the present field extension staff for adequate execution of the programme's activities.

3. Since most of the programme's past projects have been geared towards food crops particularly rice, thereby benefiting only farmers who were able to grow these crops, there is need to undertake similar projects on cash crops such as tobacco, cocoa, coffee, ginger, and oil palm. This will enable the other categories of farmers to participate and benefit from the programme.

4. One of the constraints of agricultural development as evidenced in this study was the lack of credit facilities. If any improvement is to be made by farmers in the quantity and quality of their farm produce, then they must have additional avenues of income to supplement their low incomes so as to enable them to pay for inputs, labour and other services. It is therefore recommended that credit avenues be created by the University Extension Programme for its farmers.

5. Finally, since evaluation can only be beneficial when it is a long term, continuous and built-in part of the extension programme, this type of study should be undertaken in five years from now so that this one could serve as a bench mark for measuring against future changes which might have taken place.

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