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AN ASSESSMENT OF THE IMPACT OF THE ACRE MINIKIT PROGRAM IN FIVE ZONES IN SIERRA LEONE

by

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PREFACE

The research for this study was conducted over a six month period, from March to August 1986. The primary source of data includes structured interviews with 400 farmers who had received small technology packages called minikits from the ACRE Project. Information on the minikit program was also obtained from project records and reports.

This monograph assesses the impact of the ACRE minikit program on the target farm population in the five ACRE zones of operation. It focuses on the impact of the minikits on crop production, crop techniques, farmers' attitudes and adoption of improved techology. Although the extension system is not the focus of study, its effectiveness in delivering the minikits to farmers was a major component of the minikit distribution program.

There was a high degree of awareness of the need for this study by the ACRE Project administration and the SULSU technical assistance team. The initial project objectives called for providing farming assistance to 20,000 farm families to help them increase crop production. The minikit program was implemented in an effort to achieve this objective. After the program had been in operation for four years (1981-1985), the question was, "what impact did it have on farming?"

Section 3 discusses the socioeconomic and demographic characteristics of the sample.

Section 4 presents the characteristics of the farms for the sample

of farmers.

Section 5 gives an overview of the ACRE minikit program.

Sections 6, 7, 8 and 9 provide an assessment of the minikits by the farmers.

Section 10 provides a summary of the findings of the study.

Finally, Section 11 presents the conclusions.

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INTRODUCTION

The popuiation served by the ACRE Project consists largely of small farmers whose farms average about four acres in size. Farms operated by such farmers tend to be characterized by low productivity, low level technology, and the use of the bush fallow farming practice. Samll holder farmers comprise 80 percent of the farm population of Sierra Leone and are generally in need of direct farming assistance in order to increase crop production and ultimately increase their standard of living.

In recognition of this fact, the ACRE Project launched a program to provide direct assistance to 20,000 small farm families by providing them with small technology packages consisting of improved seed and plant materials and production techniques. These small technology packages, referred to as minikits, were distributed to farmers in all five ACRE zones over a period of four years (1981-1985). The minikits were delivered to the farmers by Extension Instructors, usually at village meetings and field days. The Extension Instructors were required to keep records of the farmers who received minikits, village name, chiefdom, and date of delivery. Extension Instructors were also required to make follow-up visits to provide further information and instructions on the use of the minikits. Overall this involved many hours of work, including thousands of contacts with farmers, and the collection of large volumes of records and notes.

The large number of farmers which the ACRE Project sought to assist within a relatively short period presented a special challenge to those assigned with the responsibility of implementing the minikit program. It should be noted that the goal of providing minikits and technical information to 20,000 farmers was in addition to the major goal of providing assistance to several hundred contact farmers by assisting them in carrying out crop trials and demonstrations on their farms. There was much consensus in the ACRE Project that the minikit program should be assesed in order to determine its impact on farming practices and crop production in the target areas.

A. Purpose and Objectives

The purpose of this study is to conduct an assessment of the impact of the minikit program on the farming practices and crop production of a sample of farmers who received minikits between 1981 and 1985. The specific objectives of this study are as follows:

1. To assess the extent of use and adoption of minikit material among client farmers.

2. To assess the magnitude (scope) and patterns of distribution, maintenance and continuity of use of minikits.

3. To assess the farmers' perception of the minikits, in terms of variety preference, use, contents, complexity, and effects on labor, cost, yield and income.

4. To assess the farmers' perceptions of major problems encountered in attempting to use or adopt minikit material in their crop systems and ways in which the minikits can be improved.

5. To determine how selected ecological factors, personal characteristics of the farmer, characteristics of their farming system, interact (correlate) with use, adoption, maintenance and farmers' attitudes towards the minikits.

II. METHODOLOGY

The population from which the sample was selected consisted of all farmers on record who had received minikits between 1981 and 1985. A list of farmers was compiled from records provided by the ACRE Project which included the names and village locations of 12,500 farmers who had received minikits. A random village sampling procedure was used in obtaining the sample for the study. Approximately 3 percent of the 12,500 farmers on the list (400 subjects) were selected randomly with proportionate sampling of subjects based on the number of farmers in each village that received minikits. Random replacements of villages were made where subjects could not be found and where villages were inaccessible. This procedure permitted the selection of a representative sample in that villages were sampled proportionately based on number of farmers who had received minikits in the villages selected.

A total of 400 farmers were interviewed including 80 respondents from each of the five zones. The sample distribution by zone, chiefdom and village is show in Table 1. The sample included farmers from 24 chiefdoms and 79 villages (See Appendix).

The personal interview technique was used in collecting the data. A total of six trained enumerators conducted the interviews. The data were recorded on pre-tested interview questionnaires designed specifically for the study. Each interview took between 15 and 20 minutes

to complete. The data were collected during a 20-day period.

Since very few groundnuts and cowpea minikits were distributed to farmers, the decision was made not to include them in the study. As a result, only rice, cassava, sweet potato and maize minikits were included in the study.

The criteria for selecting farmers to be interviewed were: (1) the farmer had received an ACRE Project minikit; and (2) the minikit was received between 1981 and 1985. Contact farmers, who participated in ACRE crop trials and demonstrations were not included in the sample.

Approximately four days were spent in collecting data in each zone. A normal day began at 4:30 a.m. in order to arrive at the designated villages before farmers left to work on their farms. Interviews were conducted from 6:00 a.m. to about 9:30 a.m. Each questionnaire was checked for completion and accuracy by the field coordinator immediately after the interview was completed. The Senior Extension Officer assisted by coordinating the use of Extension Instructors in providing advance notice to farmers who were to be interviewed.

The interview questionnaire was divided into three major areas: (1) socioeconomic and demographic characteristics of the farmers; (2) characteristics of farms; and (3) evaluation of the impact of the minikits on farming.

Table 1. Sample Distribution by Zone, Chiefdom and Village

ZONE	SAMPLE SIZE	CHIEFDOMS	VILLAGES
Rokupr	80	3	16
Njala	80	7	17
Kenema	80	4	17
Kabala	80	4	16
Makeni	80	6	15
TOTAL	400	24	79

III. SOCIOECONOMIC AND DEMOGRAPHIC CHARACTERISTICS OF THE SAMPLE

The purpose of this section is to provide the socioeconomic and demographic characteristics of the sample of farmers included in the study. This data can also be used in making inferences from the sample to the larger population of farmers who received minikits, in reference to their socioeconomic and demographic characteristics.

A. Age

The age range of the sample was 15 to 82. The mean or average age was 43.6 and the median age was 41.0. This means that half of the farmers sampled were over 41 years of age and half were below 41 (Table 2).

B. Sex

A total of 344 male farmers (86%) and 56 female farmers (14%) were included in the sample (Table 2).

C. Marital Status

The majority of the respondents were married (90.5%). Only 8% were single and 1.5% were separated or divorced (Table 2).

D. Family Characteristics

The average number of children in the households of respondents was 5.4. The majority of the respondents (73.5%) had between 0 and 6 children living in the household (Table 3). The average number of adults in households was 5.1. The average number of persons per household, including adults and children, was 10.0. These statistics reveal that the household size of the respondents was relatively large, which reflects the

extended family that predominates in rural Sierra Leone.

The number of wives of a farmer is an indicator of family size, type and structure, labor resources, dependency and economic needs of the family. In the study sample, 44% of the respondents had only one wife, 46% had 2 to 3 wives and 8.6% had four or more wives (Table 3).

Few of the respondents had attained a formal education (Table 4). Only 10.5% had completed secondary school, 25.6% had no formal education, and 7.3% had completed some primary school. The largest group of respondents (36.3%) had some form of Arabic education, which was largely found among Muslim families. Low level of education is a factor limiting farmers' ability to understand complex and sophisticated technology, especially where reading and comprehending written instructions are involved.

Low income is a characteristic of the study sample. Over half of the farmers (56.6%) had estimated annual incomes of less than 1,000 leones, 19% received incomes between 2,000 and 2,999 leones, 4.8% had incomes between 3,000 and 3,999 leones, and 8.6% had incomes of 4,000 leones or more (Table 4). These income statistics reveal that small holder farmers are not completely homogeneous in terms of financial resources. Although most farmers fall on the lower end of the income continuum, the data revealed that some are more prosperous than others.

Table 2. Age, Sex and Marital Status of Respondents

Age Groups	No.	%
15 - 19	6	1.6
20 - 24	10	2.7
25 - 29	32	8.6
30 - 34	48	12.8
35 - 39	64	17.1
40 - 44	44	11.8
45 - 49	61	16.3
50 - 54	33	8.8
55 - 59	23	6.1
60 & Over	53	14.2
Total	374	100.0

Sex	No.	%
Males	344	86.0
Females	56	14.0
Total	400	100.0

Status	No.	%
Married	362	90.0
Single	32	8.0
Other	6	1.5
Total	400	100.0

Table 3. Household Size and Number of Wives

Category	Adults		Children		Category	Wives	
	No.	%	No.	%		No.	%
0 - 3	165	41.4	168	42.8	0	4	1.2
4 - 6	136	34.2	121	30.8	1	144	44.2
7 - 9	44	11.0	40	10.2	2	103	31.6
10 - 12	27	6.8	28	7.1	3	47	14.4
13 - 15	12	3.0	13	3.3	4	21	6.5
16 - 18	5	1.3	10	2.5	5	3	.9
19 & over	9	2.3	13	3.3	6	3	.9
					7	1	.3
Total	398	100.0	393	100.0	Total	326	100.0

Table 4. Education and Income Levels of Respondents

Level	No.	%	Level/Leones	No.	%
No Formal	102	25.6	0-499	128	32.2
1-3 Primary	8	2.0	500-999	97	24.4
4-7 Primary	21	5.3	1000-1449	44	11.1
Secondary	42	10.5	1450-1999	31	7.8
Arabic	145	36.3	2000-2249	27	6.8
Other	81	20.3	2250-2999	17	4.3
			3000-3249	9	2.3
			3250-3999	10	2.5
			4000 & over	34	8.6
Total	399	100.0	Total	397	100.0

IV. FARMING CHARACTERISTICS

This section includes the characteristics of the farms for the study sample. This information may help provide an understanding of the farming structure and resources of small holder farmers in the study area.

A. Ecology

The largest percentage of the farmers included in the sample were primarily upland farmers (71.5%); 21.5% farmed in inland valley swamp ecologies, 5.5% in mangrove ecologies and 1.5% in bolilands (Table 5). The upland ecology was more popular among farmers because it lends itself to the traditional mode of bush fallow rotation and cultivation practices. The availability and requirements of labor are also other important factors.

B. Farm Size

The amount of rice seeds grown in 1985 was used to estimate farm size. One bushel of rice seeds planted was estimated as equivalent to one acre of land. Using this measurement, the average number of acres farmed by the respondents included in the sample was 3.8. The data revealed that 82.3% of the sample farmed areas between one and four acres (Table 5). It is a commonly known fact that size of farm is related to type and availability of labor, type of technology used, land use patterns, land tenure and the use of other human and capital resources.

C. Farm Labor

The average number of family members working on the farms for the sample was 6. The percentages in the largest categories were: 1-3 members (24.3%); 4-6 members (38.4%); 7-9 members (17.5%); and over 9 members (19.8%) (Table 6). The respondents hired an average of 25 persons to work on their farms during the year 1985 (Table 7). In addition, respondents used an average of 5.3 days of hired labor and an average of 333 man hours of hired labor on their farms in 1985. (Tables 7 and 8).

D. Years in Farming

Respondents of the sample had been in farming for an average of 18 years. The majority (59.9%) had been in farming less than 20 years (Table 9).

E. Rice Production and Marketing

Among the total sample of 400 farmers, 70% planted rice in 1985 but did not sell any; 13% planted and sold rice and 8% did not plant rice in 1985. The 53 or 13% of the farmers who planted and sold rice in 1985 sold an average of 8 bushels of the rice they produced. The average number of bushels of rice, produced by the 353 farmers who plnated rice in 1985, was 27 (Table 10).

Twelve percent of the farmes who planted rice in 1985 traded an average of 3 bushels of their rice for other items; 65% gave away an average of 5 bushels of rice to friends and relatives; and 347 farmers stored or consumed an average of 20 bushels of rice in 1985 (Table 11).

The majority of the farmers in the sample did not sell their rice in the markets (315/368 = 85.6%). Only 53 or 14.4% reported that they sold rice. Of the 51 farmers who reported selling some of their rice, 57% sold to traders, 21.6% sold to local farmers, 17.6% sold to the market place, and only 4% sold to local buyers (Table 12). Farmers who sold rice usually sold their rice within one mile of their residence (Table 12).

Table 5. Farm Size and Farm Ecology

Acres	No.	%	Ecology	No.	%
1 - 2	156	43.7	Inland Valley Swamp	86	21.5
3 - 4	138	38.6	Upland	286	71.5
5 - 6	39	10.9	Mangrove	22	5.5
7 - 8	11	3.1	Boliland	6	1.5
9 - 10	7	2.0			
11 & over	6	1.7			
Total	357	100.0	Total	400	100.0

Table 6. Family Members Working on Farm

Category	No.	%
1-3	92	24.3
4-6	145	38.4
7-9	66	17.5
10-12	39	10.3
13-15	14	3.7
16-18	6	1.6
19 & over	16	4.2
Total	378	100.0

Table 7. Amount of Hired Labor Used on Farm in 1985

No. Persons Hired	No.	%	Days Used Hired Labor	No.	%
None	40	10.0	None	38	9.6
1 - 4	21	5.2	1 - 4	283	71.3
5 - 9	40	10.0	5 - 9	57	14.4
10 - 14	48	12.0	10 - 14	11	2.8
15 - 19	38	9.5	15 - 19	1	.2
20 - 24	47	11.8	20 - 24	2	.5
25 - 29	24	6.0	25 - 29	0	0
30 - 39	49	12.2	30 - 39	1	.2
40 - 49	32	8.0	40 - 49	0	0
50 & over	61	15.3	50 & over	4	1.0
	400	100.0		397	100.0

Table 8. Man Hours of Hired Labor Used on Farm in 1985.

No. Man Hours	No.	%
None	32	8.1
1 - 49	21	5.3
50 - 99	30	7.5
100 - 149	30	7.5
150 - 199	25	6.3
200 - 249	26	6.5
250 - 299	16	4.0
300 - 349	18	4.5
350 - 399	14	3.5
400 - 449	16	4.0
450 - 499	26	6.5
500 & over	144	36.2
	398	99.9

Table 9. Years in Farming

Years	No.	%
1 - 9	114	29.3
10 - 19	119	30.6
20 - 29	90	23.1
30 - 39	43	11.1
40 - 49	16	4.1
50 & Over	7	1.8
Total	389	100.0

Table 10. Bushels of Rice Produced in 1985

Bushels	No.	%
1 - 9	75	21.2
10 - 19	98	27.8
20 - 29	60	17.0
30 - 39	42	11.9
40 - 49	30	8.5
50 - 59	17	4.8
60 - 79	18	5.1
80 - 99	6	1.7
100 or More	7	2.0
Total	353	100.0

Table 11. Amount of Rice Sold, Traded, Given Away and Consumed by Respondents in 1985

Bushels	Sold No.	Sold %	Traded No.	Traded %	Given Away No.	Given Away %	Consumed No.	Consumed %
1 - 4	20	37.7	34	77.2	154	64.2	31	8.9
5 - 9	14	26.4	3	6.8	61	25.4	69	19.9
10 - 14	9	17.0	4	9.1	21	8.8	68	19.6
15 - 19	1	1.9	0	0	2	.8	26	7.56
20 - 24	8	15.1	1	2.3	0	0	44	12.7
25 - 29	0	0	0	0	1	.4	40	11.5
30 - 39	1	1.9	1	2.3	0	0	24	6.9
40 - 49	0	0	0	0	1	.4	27	7.8
50 or over	0	0	1	2.3	0	0	18	5.2
Total	53	100.0	44	100.0	240	100.0	347	100.0

Table 12. Distance to Market and Market Where Rice Was Sold

Miles to Market	No.	%	Place of Rice Sale	No.	%
1 or less	41	89.0	Local Farmer	11	21.5
2	0	0	Local Buyer	2	3.9
3	0	0	Trader	29	56.9
4	1	2.2	Town Market	1	2.0
5	1	2.2	Distant Market	3	5.9
6	1	2.2	Nearest Market	5	9.8
7	1	2.2			
8	1	2.2			
Total	46	100.0	Total	51	100.0

V. OVERVIEW OF THE ACRE MINIKIT PROGRAM

An investigation was conducted to determine the background, organization and nature of operation of the minikit program. This investigation was also conducted to determine the objectives and structure of the minikit program, what had been done, and what were the results. The main sources of information for this investigation were official documents, project records and personal interviews with project personnel. The results are reported in this section.

A. Question: What are the purpose and objectives of the minikit program?

Finding: The initial project paper of December 1977 stated that one objective of the ACRE Project was to provide direct benefits to 20,000 farm families by providing them with seed, plant materials and technical farming information. The goal was to increase crop production and ultimately increase the standard of living of small holder farmers and their families. The project also sought to decrease the cost of farming information while increasing access to new crop varieties.

B. Question: What method was used to achieve the above objectives?

Finding: The method used to achieve the objectives was the distribution of small technology packages called minikits which contained

samples of seed and plant materials and instructions. The three major components of the program included: (1) research to develop appropriate technology packages; (2) the use of an extension system to deliver the packages to the farmers; and (3) monitoring the program by providing technical information and instructions to farmers, follow-up visits, and maintaining records of deliveries and the name of farmers who received minikits. In addition, to supervising 15 contact farmers, each Extension Instructor was required to monitor at least 300 interested farmers, most of whom had received minikits. According to the project proposal, a total of $45,000 was initially budgeted for the cost of the minikits.

C. Question: How are the contents of the minikits selected?

Finding: The contents of the minikits were selected based on results obtained from crop trials and demonstrations, taking into consideration fertilization recommendations, planting methods and type of farming ecology. Successful demonstrations as perceived by farmers were developed into minikit packages. Improved crop varieties which received farmers approval during the demonstrations were issued to farmers along with instructions on the proper agronomic practices. In some instances, seed bed preparation and planting demonstrations were given. Several types of plant material were included in different minikits, including rice, sweet potatoes, maize, cassava, groundnuts and cowpeas. Relatively few groundnut and cowpea minikits were developed and distributed to farmers.

D. Question: What criteria were used in selecting minikit recipients?

Finding: In each zone, announcements were periodically made in all villages within a designated area that minikits would be given away at a particular place and time. Farmers who responded and showed interest in the ACRE Project activities and were willing to use the minikit material in their farms were given minikits. Minikits were also distributed at agricultural shows, field days and village meetings. In some cases, minikits were given to schools, government institutions and agricultural agencies who were intructed to distribute the minikits to interested farmers. Individual farmers also requested and received minikits from the Extension Instructors.

E. Question: Who delivered the minikits to farmers?

Finding: Minikits were delivered primarily by Extension Instructors, and in some cases by Senior Extension Officers. A few minikits were also distributed to some farmers by school personnel, agricultural agencies, government institutions, paramount chiefs, village chiefs and Section headmen.

F. Question: How many farmers in each zone received minikits and how many and what type did they received?

Finding: It was reported that over 20,000 farmers received minikit packages, however, the exact number could not be documented at the time because records were not available. Some of the records were missing, incomplete or untabulated. Furthermore, many contact farmers issued planting materials to other farmers in their area for which no records are available. Thus the exact number of minikit packages distributed to farmers could not be accurately determined. The lists of

minikit farmers from which the sample for this study was drawn included about 12,500 names, approximately 2,500 from each zone. Some of the names of minikit farmers were not recorded or the records were lost. Moreover, many farmers received more than one minikit. In most instances the type of minikit given to the farmer was not recorded.

The most current report by the ACRE Project stated that between 1982 and 1986 over 20,000 farmers received minikits. What is not known, however, is the extent to which the minikits were used or not used by the farmers. Since no definite guildelines were initially set forth by the project proposal, in reference to level of agricultural and economic development farmers were expected to achieve, little in known of the actual impact of the minikits on farming. Moreover, little data have been compiled which would provide information about the use of minikits by farmers. Consequently, the impact of the minikits on farming practices, crop production, farmers attitudes and adoption behavior could not be determined. Information on the value of the minikits to the farmers, problems encountered in their use, and suggestions for improvement was not available. The present study was designed to provide information in this area.

VI. AN ASSESSMENT OF THE ACRE MINIKIT PROGRAM IN THE FIVE ACRE ZONES

A. Number of Minikits Received by Farmers

The data revealed that many farmers received more than one minikit - 1.5 percent received four minikits, 5.0 percent received three, 22.8 percent received two, and 70.7 percent received one minikit (Table 13). There was no indication that project guidelines or objectives called for issuing more than one minikit to one farmer. However, the fact that 29.3 percent of the farmers included in the sample received more than one minikit restricted the overall number of farmers who could have received at least one minikit. This factor could influence the projects goal of providing benefits to at least 20,000 farmers. Under this system, more than 20,000 minikits would have to be distributed in order to reach the minimum goal of 20,000 farmers.

B. Fertilizer Contents of Minikits

The data revealed that 22.7 percent of the farmers included reported receiving minikits with fertilizer and 77.3 percent reported receiving minikits without fertilizer (Table 13). These results indicate that many farmers received minikits that did not contain a complete package of material. This could have the effect of limiting crop yield for the improved crop varieties, which tend to perform best when used with fertilizer. On the other hand, one would expect that farmers who received and used fertilizer on their crops would have higher yields than

those who did not receive fertilizer.

In terms of type of minikit, 91 farmers received rice minikits, 41.8 percent with fertilizer and 58.2 percent without fertilizer (Table 14). This is compared to 78 who received cassava minikits, 33.3 percent with fertilizer and 66.7 percent without fertilizer; 273 farmers received sweet potato minikits, 20 percent with fertilizer and 80 percent without fertilizer; 109 farmers received maize minikits, 36.7 percent with fertilizer and 63.3 percent without fertilizer. As indicated by these statistics, farmers received rice minikits more often with fertilizer compared with other types of minikits. Sweet potato minikits were received more often without fertilizer, followed by cassava minikits. It should be pointed out that more sweet potato minikits were received (about 50 percent of total) than any other type of minikit. This finding suggests that more sweet potato minikits were distributed by the ACRE Project than any other type. This is a plausible conclusion due to the greater availability of and ease in which sweet potato planting material can be reproduced and diffused among farmers. This also could possibly indicate high popularity and high demand for sweet potatoes. Sweet potatoes are very highly adaptable and is an important crop of great value during the hungry season when foodstuff is scarce.

C. Temporal Distribution of Minikits

The data in Table 15 show the temporal distribution patterns of minikits received by farmers of the sample. Minikit distribution reached its peak in 1984 when 246 farmers (44.7 percent of the total) received

their first minikit. 1981, 1982, and 1985 were lean years as only 135 farmers reported that they first received a minikit. The type of minikit received first by the largest proportion of farmers was the sweet potato minikit. Maize was second, rice third, and cassava fourth.

D. Crop Varieties Included in Minikits Distributed

Table 16 shows the different crop varieties received in the minikits by farmers of the sample. For rice minikits, Rok 16 was the most common variety included, followed by CP4, Rok 10, and Lac 23 (Table 16). The largest proportion of the cassava minikits included Rocass 1, followed by Rocass 3 and Nucass 1. Ropot 2 was the most common variety included in sweet potato minikits (Table 18). Many farmers however, could not remember whether they received Ropot 1 or Ropot 2 sweet potatoes. Senior Extension officers reported that Ropot 2 were included in the majority of the sweet potato minikits, as this was the variety which was more popular among the farmers. Only one variety of corn, Western Yellow was included in the maizes minikits. Western Yellow has been proven to be suitable and adaptable to a wide range of areas and conditions in Sierra Leone.

E. Source of Delivery of Minikits

The great majority of the sample received minikits from the Extension Instructor: 89%, 89.7%, 71.5% and 80.4% for rice, cassava, sweet potato and maize, respectively (Table 17). In a few cases, minikits were received from other farmers. This occurred to a greater extent for sweet potatoes and maize. Sweet potato and maize planting material appeared to lend themselves more to sharing among farmers when compared

to rice and cassava. However, under the current ACRE Program, the Extension Instructor plays the more dominant role in the delivery of minikit materials to farmers. Perhaps when farmers are able to produce more of their planting material in village multiplication centers, they may become more prominent in the distribution process. Alternatively, farmers may be encouraged to purchase their seed and planting material from regional or local seed distribution centers for a small fee. This could possibly be a goal that national agricultural programs may wish to pursue.

F. Method of Delivery of Minikits

A noteworthy fact revealed by the data is that the majority of the sample received their minikits in the local or surrounding area, such as their homes, on their farms or in village meetings (Table 18). The ACRE Project delivered the minikits directly to the farmers in their local setting, a practice made necessary due to the limited development of the infrastructure (transportation and communication) and the scarcity of improved seeds and planting material. The use of this method allowed the Extension Instructor to work with farmers on their farms, within a setting familiar to them. Thus a strong and effective extension delivery component is needed. Farmers must be encouraged to share more farming information and planting material with other farmers. And with the development of seed distribution centers, farmers might become less dependent on the ACRE Project providing free planting materials or improved crop varieties. Although the providing of free or low cost planting

material may be necessary at this time, this should be done with some larger goal in mind.

G. Farmers' Understanding of Minikit Use

Farmers reported they had no problems understanding the instructions on how to use the minikits (Table 19). This was most likely due to the fact that, in the majority of the cases, the Extension Instructor explained the instructions to the farmers or gave them simple demonstrations (Table 20).

H. Maintenance of Minikits by Farmers

An important indicator used to determine the extent of use of the minikits was the length of time the farmers were able to maintain seed and planting material from the minikits. Previous data revealed that most farmers received their first minikit in 1983 and 1984 or 2 to 3 years prior to this study. As shown in Table 21, the majority of the farmers reported that they were able to maintain planting material from the minikits they received for two to three years. Farmers tended to be better able to maintain cassava and sweet potatoes, compared to maize and rice. The data in Table 21 also reveal that a sizeable proportion of farmers were only able to maintain planting material from their minikits for one year or less. This could be due to a number of factors, including lack of knowledge, lack of resources, destruction by disease and pest, and lack of effort. It was discovered in the Kenema zone that some farmers leave their farms during the dry season to work part-time in the more lucrative diamond mines or in other non-agricultural jobs, leaving their

crops unattended. When they return to their farms at the beginning of the planting season, they have no planting material because it had not been maintained or was destroyed by cattle, rodents or pests. This was particularly true in the case of sweet potatoes which must be maintained in the swamps during the dry season if planting material is to be available for the planting season.

Another indication of the farmers' ability to maintain planting material included in the minikits is the amount of material planted from the minikits during the previous year 1985. There was wide variation among the farmers, in this regard, for all types of minikits (Tables 24-26). Farmers showed a greater capacity to maintain or plant improved cassava and sweet potatoes and less capacity to maintain rice and maize. As shown in Tables 24, 25 and 26, some farmers were not able to maintain planting materials from the rice, cassava and maize minikits which they received. Most farmers who used fertilizer only used small quantities due to cost and lack of availability (Table 26). About 63 percent of the farmers who received fertilizer in their minikits in 1985 only used between one and nine kilograms of fertilizer, and about 32 percent used no fertilizer in 1985 (Table 26).

I. Desire to Use Minikits Among Farmers

Farmers overwhelmingly reported the desire to continue using improved seed and plant materials provided in the minikits (Table 22). This is expected because the minikits were delivered to farmers by the Extension Instructors at no cost to the farmers. Farmers were also

very aware that improved crop varieties could help increase their crop yield.

J. Frequency of Visits to Farmers by Extension Workers

The average number of visits that farmers with rice minikits received from an Extension Instructor was three compared to approximately four visits for farmers who received cassava, sweet potato and maize minikits (Table 23). This factor is very important because the ACRE Project is heavily dependent on getting farming information and improved crop varieties to the farmers in order to help increase crop production.

K. Difficulties in Using Minikits

The farmers included in the sample expressed a very high desire for using all types of minikits (Table 27). Most of the farmers also reported that the minikits were not difficult to use. However, there was some indication that the minikits were difficult to use for some farmers. This was especially true for the rice minikits (Table 28). About one-fourth of the sample (111) reported that the minikits were not easy to use.

Cost was found to be a major limitation to farmers in using minikits. Well over two-thirds of the farmers reported that it was moderately too highly costly to use the ACRE minikits (Table 29). Usually, farmers calculate cost by the amount of labor required and the amount of leones needed to purchase required items such as fertilizer. In order to obtain the maximum yield from the improved crop varieties included in the minikits, adequate amounts of labor and fertilizer are required. Thus farmers

could see improved crop varieties as very costly to use and maintain.

The fact that labor requirement is a concern of farmers who use minikits may be revealed by the question, "how much time do you save when using minikits?" The data in Table 30 show that many farmers feel that "time saving" is not a major attribute of the minikits they received. In fact, this suggests that many farmers believe that crop varieties included in the minikit require much time or labor. However, the data revealed that "time saving" as an attribute of minikits was greater when using sweet potato, maize and cassava minikits, compared to rice (Table 30).

L. Farmers' Yield and Income Benefits From Using Minikits

A major objective of the minikit program was to help farmers increase their crop yields and incomes. Thus an important objective of this study was to determine to what extent did minikits received by farmers help increase their crop yields and incomes. Table 31 shows that the vast majority of the farmers reported that using minikits had resulted in substantial increases in yields. This ranged from a high of 78 percent for farmers receiving rice minikits, 73 percent for sweet potatoes, 73 percent for maize and 67 percent for cassava (Table 31).

Although farmers were somewhat less impressed with the minikits as a way of increasing their incomes, many reported that using the minikits had increased their income. Generally, farmers reported that rice minikits were more valuable in helping to increase their incomes. This was followed by maize, sweet potatoes and

cassava minikits (Table 32). As will be pointed out later, most farmers did not sell their crop produce but used it mainly for family consumption or shared it with friends and relatives. Twenty one-percent of the farmers interviewed reported that their income would increase little or none as a result of using minikits (Table 32). This suggests that only a small portion of any increased crop yields resulting from use of the minikits was converted into real income from cash sales.

M. Problems Reported in Using Minikits

Another major objective of this study was to determine what problems farmers experienced when using minikits and ways in which they thought the minikits could be improved. The study found that problems which farmers reported when using minikits were very similar to problems associated with farming in general. For example, the most common problem reported by farmers in using rice and cassava minikits was crop damage or destruction by rodents and other pests. Some farmers reported problems with weed control (Tables 33 and 34). Relatively more problems of this type were reported by farmers who received cassava, sweet potato and maize minikits. Ironically, farmers perceived problems involving the use of minikits in terms of lack of control of rodents, monkeys, goats, birds, thieves and weeds which are largely problems found in the farmers' farming environment and ecology. This indicates that farmers have problems controlling the biological, physical, environmental and human-created conditions in their surroundings. It is also ironic that few farmers directly reported cost and labor as problems when using the minikits. It is

also noteworthy that some farmers reported no problems when using the minikits (Tables 33 and 34).

N. Improvements in Minikits Recommended by Farmers

When farmers were asked how could the minikits be improved the following answers were among the more common responses: (1) need for more fertilizer; (2) need for more seeds and planting material; (3) pest control; and (4) receiving seeds and planting material in a timely manner at the beginning of the planting season (Tables 35 and 36). These results suggest that farmers need help in solving farming problems within their farming system in addition to receiving more improved crop varieties. The failure to resolve these problems poses a threat to increased crop yields from improved crop varieties. As one farmer put it, "what good does it do to plant improved varieties if pests eat them up?" It seems apparent that farmers need appropriate, economical and accessible resources to control these problems as well as adequate education, training and management skills in farming. Of course, adequate financial resources are also needed. A plausible approach to resolving these problems is the adoption of a complete crop system program along with environmental controls. However, this wholistic approach to farm development among samllholders is a very extensive and expensive proposition in an area where both the farmers' and the governments' resources are limited. This dilemma is a major obstacle to grassroots agricultural development projects aimed at assisting subsistence farmers.

O. Social Contact as a Source of Diffusion of Minikit Materials

The data revealed that farmers were very much aware of the minikit program and were very helpful in the diffusion of minikit

material to others farmers through an extended family and community sharing system. As shown in Table 37, the great majority of the farmers reported they knew at least two other farmers who had used minikits. Contact farmers can be especially valuable in this regard. Almost all of the farmers (95.5%) reported they knew an ACRE contact farmer (Table 38). The majority of these farmers also reported that they had received farming information and planting material from a contact farmer at least once. A larger proportion of farmers received farming information than planting materials from contact farmers (Table 39).

Table 13. Number of Minikits Received by Farmers

Number	With Fertilizer		Without Fertilizer		Total	
	No.	%	No.	%	No.	%
One	48	12.0	235	58.7	283	70.7
Two	27	6.8	64	16.0	91	22.8
Three	10	2.5	10	2.5	20	5.0
Four	6	1.5	0	0	6	1.5
Total	91	22.8	309	77.2	400	100.0

Table 14. Type of Minikits Received by Farmers

Type of Minikit Received	With Fertilizer		Without Fertilizer		Total	
	No.	%	No.	%	No.	%
Rice	38	41.8	53	58.2	91	100.0
Cassava	26	33.3	52	66.7	78	100.0
Sweet Potato	55	20.0	218	80.0	273	100.0
Maize	40	36.7	69	63.3	109	100.0

Table 15. Year First Received a Minikit

Year	Rice		Cassava		Sweet Potato		Maize		Total	
	NO.	%	No.	%	No.	%	No.	%	No.	%
1981	5	5.5	3	3.8	7	2.6	7	6.3	22	4.0
1982	14	15.4	14	17.9	37	13.7	14	12.6	79	14.4
1983	23	25.3	25	32.1	81	30.0	40	36.0	169	30.7
1984	36	39.5	35	44.9	128	47.4	47	42.4	246	44.7
1985	13	14.3	1	1.3	17	6.3	3	2.7	34	6.2
Total	91	100.0	78	100.0	270	100.0	111	100.0	550	100.0

Table 16. Crop Varieties Received in Minikits by Farmers

Rice	No.	%	Cassava	No.	%
Rok 16	31	39.2	Rocass 3	17	27.0
Rok 10	12	15.2	Rocass 1	24	38.1
CP 4	18	22.8	Nucass 2	6	9.5
LAC 23	12	15.2	Nucass 1	16	25.4
TOS 78	3	3.8			
Rok 12	1	1.3			
Total	79	100.0		63	100.0

Sweet Potato	No.	%	Maize	No.	%
Ropot 1	23	8.6	Western Yellow	103	100.0
Ropot 2	88	33.1			
Ropot	155	58.3			
Total	266	100.0		103	100.0

Table 17. Sources From Which Farmers Received Minikits

Source	Rice		Cassava		Sweet Potato			
	No.	%	No.	%	No.	%	No.	%
Extension Instructor	81	89.0	70	89.7	196	71.5	86	80.4
Senior Ext. Officer	2	2.2	1	1.3	2	.7	0	0
Other ACRE Staff	0	0	0	0	1	.4	1	.9
Contact Farmer	4	4.4	4	5.1	20	7.3	2	16.8
Another Farmer	4	4.4	3	3.9	53	19.4	18	16.8
Other	0	0	0	0	2	.7	0	0
Total	91	100.0	78	100.0	274	100.0	107	100.0

Table 18. Location Where Farmer Received Minikits

Location	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
Home	59	64.8	42	53.2	167	61.2	73	67.6
Village Meeting	14	15.4	23	29.1	45	16.5	18	16.7
Farm	12	13.2	11	13.9	31	11.4	6	5.6
Field Day	6	6.6	2	2.5	29	10.6	10	9.2
ACRE Office	0	0	1	1.3	0	0	0	0
Other	0	0	0	0	1	1.3	1	.9
Total	91	100.0	79	100.0	273	100.0	108	100.0

Table 19. Did Farmers Understand Instructions on How to Use The Minikits?

Response	Rice No.	Cassava No.	Sweet Potato No.	Maize No.	Fertilizer No.
Yes	90	76	271	108	87
No	1	3	2	1	1
Total	91	79	273	109	88

Table 20. Who Helped Farmers to Understand the Minikit Instructions?

	Rice		Cassava		Sweet Potato		Maize		Fertilizer	
	No.	%	No.	%	No.	%	No.	%	No.	%
Ext. Instructor	74	79.5	61	82.4	167	64.0	69	67.6	63	73.3
Contact Farmer	0	0	0	0	20	7.7	2	2.0	2	2.3
Other Farmer	3	3.2	3	4.0	28	10.7	11	10.8	0	0
Senior Officer	1	1.1	1	1.4	2	.7	0	0	0	0
ACRE Trainee	2	2.2	0	0	2	.7	1	1.0	3	3.5
Others	13	14.0	12	16.2	42	16.1	19	18.6	18	20.9
Total	93	100.0	74	100.0	261	99.9	102	100.0	86	100.0

Table 21. How Long Were You Able to Maintain the Minikit You Received?

	Rice		Cassava		Sweet Potato		Maize	
Years	No.	%	No.	%	No.	%	No.	%
One or Less	30	34.1	18	23.1	86	32.7	30	28.6
Two	37	42.0	36	46.2	120	45.6	46	43.8
Three	15	17.1	19	24.3	45	17.1	19	18.1
Four	3	3.4	4	5.1	10	3.8	7	6.7
Five	3	3.4	1	1.3	2	0.8	3	2.8
Total	88	100.0	78	100.0	263	100.0	105	100.0

Table 22. Would You Like to Continue Using the Minikit?

Response	Rice No.	Cassava No.	Sweet Potato No.	Maize No.	Fertilizer No.
Yes	91	79	269	105	86
No.	0	0	3	1	0
Total	91	79	272	106	86

Table 23. Number of Visits Farmers Received From Extension Instructor to Provide Assistance on How to Use Minikits?

Visits	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
None	13	13.0	11	13.2	42	15.5	19	16.8
1 - 2	21	21.0	12	14.5	48	17.6	15	13.3
3 - 4	12	12.0	7	8.4	34	12.5	13	11.5
5 or More	54	54.0	53	63.9	148	54.4	66	58.4
Total	100	100.0	83	100.0	272	100.0	113	100.0

Table 24. Estimated Seeds Planted From Rice Minikit in 1985.

Amount	Rice	
	No.	%
None	15	14.7
1 tin	41	40.2
2 tins	19	18.6
3 tins	4	3.9
1 bushel	12	11.8
2 or more bushels	2	2.0
Don't Know	9	8.8
Total	102	100.0

Table 25. Estimated Material Planted From Cassava and Sweet Potato Minikits in 1985

Number of Heaps of Cassava	No.	%	Number of Cuttings of Sweet Potatoes	No.	%
None	14	16.5	1 - 99	48	18.5
1 - 9	17	20.0	100 - 199	40	15.4
10 - 19	10	11.7	200 - 299	47	18.1
20 - 29	13	15.3	300 - 399	41	15.7
30 - 39	5	5.9	400 - 499	22	8.5
40 - 49	4	4.7	500 - 599	16	6.1
50 & Over	22	25.9	600 or More	46	17.7
Total	85	100.0		260	100.0

Table 26. Estimated Maize Seeds Planted and Fertilizer Used From Minikits in 1985.

Cups of Maize Seeds	No.	%	Kilograms of Fertilizer	No.	%
None	12	10.6	None	17	31.5
1 - 5	89	78.8	1 - 9	34	62.9
6 - 9	2	1.8	10 - 19	0	0
10 - 14	1	.9	20 - 29	2	3.7
15 & Over	9	7.9	30 - 59	0	0
			60 - 89	0	0
			90 & Over	1	1.9
Total	113	100.0		54	100.0

Table 27. Do you Like Using the Minikit?

Response	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
Little	2	2.2	1	1.3	8	2.9	5	4.6
Some	3	3.3	5	6.4	19	7.0	9	8.4
Much	86	94.5	72	92.3	245	90.1	94	87.0
Total	91	100.0	78	100.0	272	100.0	108	100.0

Table 28. How Easy Is It To Use The Minikit?

Response	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
Little	31	34.4	11	14.1	48	17.5	20	18.9
Some	47	52.2	58	74.4	199	72.6	79	74.5
Much	12	13.3	9	11.5	27	9.9	7	6.6
Total	90	99.9	78	100.0	274	100.0	107	100.0

Table 29. How Costly Is It To Use The Minikit?

Response	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
Little	25	27.5	20	26.0	76	27.9	27	25.7
Some	20	22.0	29	37.7	116	42.7	44	41.9
Much	46	50.5	28	36.3	80	30.4	34	32.4
Total	91	100.0	77	100.0	272	100.0	107	100.0

Table 30. How Much Time Do You Save When Using the Minikit?

Response	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
Little	32	50.8	29	36.7	90	33.1	35	32.7
Some	17	27.0	22	27.8	91	33.4	38	35.5
Much	14	22.2	28	35.5	91	33.4	34	31.8
Total	63	100.0	79	100.0	272	100.0	107	100.0

Table 31. Has Using The Minikit Increased Your Yield?

Response	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
Little	9	9.9	12	15.6	18	6.5	8	7.5
Some	11	12.1	14	17.9	56	20.4	21	19.8
Much	71	78.0	52	66.7	201	73.1	77	72.7
Total	91	100.0	78	100.0	275	100.0	106	100.0

Table 32. Has Using the Minikit Increased Your Income?

Response	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
Little	14	15.6	18	22.8	41	15.1	11	10.2
Some	28	31.1	32	40.5	118	43.4	44	40.7
Much	48	53.3	29	36.7	113	41.5	53	49.1
Total	90	100.0	79	100.0	272	100.0	108	100.0

Table 33. Major Problems When Using the Minikit (First Problem)

Problem	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
None	2	2.2	2	2.6	14	5.3	4	4.0
Rodents	32	35.9	38	50.0	111	42.0	36	36.4
Weeds	7	7.9	9	11.8	23	8.7	10	10.1
Thief	0	0	2	2.6	5	1.9	1	.1
Birds	16	18.0	0	0	0	0	5	5.0
Monkeys	0	0	2	2.6	21	8.0	16	16.1
Lack of Tools	0	0	0	0	1	.4	0	0
Lack of Fertilizer	0	0	1	1.3	17	6.4	8	8.1
Goats	0	0	5	6.6	17	6.4	2	2.0
Others	32	35.9	17	22.4	55	20.8	17	17.2
Total	89	99.9	76	99.9	264	99.9	99	100.0

Table 34. Major Problem When Using the Minikit (Second Problem)

Problem	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
None	14	16.5	11	14.5	38	14.5	13	13.5
Rodents	33	38.8	33	43.4	107	40.8	39	40.6
Weeds	2	2.4	4	5.3	12	4.6	5	5.2
Thief	0	0	1	1.3	2	.8	2	2.1
Birds	12	14.1	0	0	1	.4	3	3.1
Monkeys	0	0	3	3.9	15	5.7	11	11.5
Lack of Tools	0	0	0	0	2	.8	0	0
Lack of Fertilizer	0	0	5	6.6	24	9.2	8	8.3
Goats	0	0	3	3.9	9	3.4	1	1.1
Others	24	28.2	16	21.1	52	19.8	14	14.6
Total	85	100.0	76	100.0	262	100.0	96	100.0

Table 35. Ways Which Farmers Think the Minikits Can Be Improved (First Answer)

Responses	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
More Instructions	2	2.3	2	2.5	4	1.5	3	2.9
More Fertilizer	7	8.0	17	21.3	74	27.4	33	31.4
More Seed, etc.	44	50.0	19	23.8	85	31.5	31	29.5
More Minikits	19	21.6	20	25.0	52	19.2	22	21.0
Pest Control	4	4.5	8	10.0	18	6.6	5	4.8
Timely Seeds	3	3.4	3	3.8	16	5.9	6	5.7
Need Tools	0	0	6	7.5	8	3.0	2	1.9
Better Varieties	3	3.4	2	2.5	1	.4	0	0
Credit	1	1.1	1	1.2	4	1.5	0	0
Others	5	5.7	2	2.5	8	3.0	2	1.9
None	0	0	0	0	0	0	1	.9
Total	88	100.0	81	99.9	270	100.0	105	100.0

Table 36. Ways Which Farmers Think the Minikits Can Be Improved (Second Answer)

Responses	Rice		Cassava		Sweet Potato		Maize	
	No.	%	No.	%	No.	%	No.	%
More Instructions	3	3.4	2	2.5	8	3.0	4	3.8
More Fertilizer	34	39.1	39	48.1	147	54.9	56	53.3
More Seed, etc.	23	26.4	13	16.0	40	14.9	23	21.9
More Minikits	8	9.2	9	11.1	18	6.7	5	4.8
Pest Control	7	8.0	6	7.4	20	7.5	6	5.7
Timely Seeds	2	2.3	4	4.9	12	4.5	5	4.8
Need Tools	0	0	0	0	0	0	0	0
Better Varieties	3	3.5	1	1.2	0	0	0	0
Credit	2	2.3	0	0	2	.7	0	0
Others	2	2.3	2	2.5	8	3.0	2	1.9
None	3	3.5	5	6.2	13	4.8	4	3.8
Total	87	100.0	81	99.9	268	100.0	105	100.0

Table 37. Number of Farmers You Know Who Have Used Minikits

Number	No.	%
One	19	5.0
Two	60	15.7
Three	51	13.3
Four	30	7.9
Five or More	222	58.1
Total	382	100.0

Table 38. Do You Know an ACRE Contact Farmer?

Response	No.	%
Yes	379	95.5
No	18	4.5
Total	397	100.0

Table 39. Number of Times You Have Received Farming Information/ Planting Materials From An ACRE Contact Farmer

No. Times	Information		Planting Material	
	No.	%	No.	%
None	86	21.8	137	34.7
One	71	18.0	139	35.2
Two	64	16.3	34	8.6
Three	30	7.6	13	3.3
Four	16	4.1	10	2.5
Five or More	127	32.2	62	15.7
Total	394	100.0	395	100.0

VII. FACTORS INFLUENCING MINIKIT DISTRIBUTION, USE AND MAINTENANCE

A. Distribution of Minikits by Zone

Ninety-one (23%) of the 400 farmers included in the study reported that they received rice minikits. The percentages of farmers who reported receiving rice minikits by zone were as follows: Rokupr (49.4%); Kabala (23.0%); Kenema (9.9%); Makeni (8.8%); and Njala (8.8%). These results reveal that the greatest proportion of responsents who received minikits were from the Rokupr Zone and the smallest proportion from Makeni and Njala zones.

The largest proportion of the sample who received cassava minikits was from Makeni Zone (39.7%), followed by Rokupr Zone (23.1%), Kenema Zone (15.4%), Kabala Zone (12.8%) and Njala Zone (9.0%).

For sweet potatoes, 24.9% of the sample who received sweet potato minikits were from Makeni Zone; Kenema (20.9%); Kabala (20.5%); Njala (18.3%); and Rokupr (15.4%).

Njala Zone respondents received 31.2% of the maize minikits reported, followed by Kabala (22.9%); Kenema (20.2%); Rokupr (11.9%); and Makeni (13.8%). These results show that the distribution of minikits among the five zones varied by type. If the above data are valid, we can infer that relatively more cassava and sweet potato minikits were distributed in Makeni Zone and relatively more maize minikits were distributed in Njala Zone.

The study revealed that the number of farmers who received minikits without fertilizer far outnumber those who received minikits with fertilizer and this was the case in all zones. The ratio was approximately 2.5 to one - which means that the number of farmers receiving minikits without fertilizer was two and one-half times greater than those who received minikits with fertilizer.

The number of farmers who received two or more minikits without fertilizer was proportionately higher in Makeni Zone (42.5%), compared to Rokupr (42.3%), Njala (41.3%), Kabala (28.8%), and Kenema (23.2%). A substantial proportion of farmers in all zones reported receiving two or more minikits (with and without fertilizer).

The distribution of rice minikits reached a peak in Kabala Zone in 1983, compared to 1984 in the other zones. The distribution of cassava minikits peaked in Kabala, Njala and Kenema Zones in 1983, compared to 1984 in Rokupr and Makeni. Sweet potato minikit distribution peaked in 1984 in Kabala, Makeni, Njala and Kenema Zones and in 1985 in Rokupr. And the distribution of maize minikits peaked in Makeni and Kenema Zones in 1983 and in the rest of the zones in 1984.

B. Minikit Maintenance by Zone

The data revealed no zonal difference in the ability of farmers to maintain seeds and planting material included in their minikits from year to year. Generally, farmers in all zones reported that they were able to maintain planting material from their minikits from one to two years, with two years being the modal response. Due to the fact that

the year which farmers received minikits varied, these results must be interpreted with caution. Most of the respondents received minikits in 1983 and 1984, two or three years prior to this study.

C. Reported Yield and Income Benefits of Minikits by Zone

The majority of the respondents in all zones reported that the minikits they received helped to increase their crop yield. This was true for rice, cassava, sweet potato and maize minikits. The more positive responses, however, were given in Kabala and Makeni zones. This finding is consistent with earlier studies which revealed that farmers are generally aware of the yield benefits that can be derived from using improved crop varieties.

Farmers were also very positive toward the income benefits derived from using minikits. This was the case in all zones. However, respondents were less optimistic about the income benefits of the minikits than they were about the yield benefits of the minikits. This was also the case in all zones. It should be remembered here that many farmers do not sell their rice but use it for family consumption, which is not converted into real income. Thus there is a low conversion of crop yields into cash income from the sale of crop produce. Generally, respondents reported that rice minikits contributed more to increased incomes, compared to other types of minikits. This suggests that rice is more important as a cash or sale crop from which real income can be derived. This tended to be the case in all zones with only minor

differences. Respondents from Rokupr Zones, however, tended to be less optimistic about the income benefits that could be derived from using minikits.

D. Reported Problems With Minikits by Zone

Problems which farmers reported in using minikits were largely related to lack of control over the physical environment and human factors. The most common problem farmers reported with rice minikits in all zones was pest control, particularly rodents. Rodents were particularly reported as a problem encountered in using rice minikits. This was especially true in Kabala Zone. Other problems experienced by farmers in all zones were damage [illegible] birds and weed control. Overall, respondents from Rokupr Zone reported the greatest number of problems in using rice minikits, followed by Kabala Zone. Similar problems were experienced by farmers in all five zones in using cassava minikits. Relatively more problems were experienced by farmers in Makeni Zone and Rokupr Zone.

Relatively more problems in using sweet potato minikits were reported by the respondents of Makeni Zone. The most common problems reported were pest control and lack of fertilizer. Farmers who received maize minikits reported problems with pest control and crop damage by monkeys. A relatively larger number of farmers from Njala and Kabala zones reported such problems in using maize minikits, compared to the

other zones.

E. Farmers' Suggestions on Minikit Improvements

A wide range of suggestions were made for improving minikits in all five zones. Respondents from Kabala and Rokupr were largely concerned with making more rice minikits available so as to increase the amount of rice seeds for planting. They also suggested that a larger quantity of seeds and planting material of all types be made available to farmers in the minikits.

Farmers who received cassava minikits also suggested that more planting material be included in the kits. They also felt that larger quantities of fertilizer should be included and that the small portion received was inadequate. Some farmers received no fertilizer in their minikits and were aware that this would limit crop yield. These problems were especially expressed by respondents from Kabala, Rokupr and Makeni zones.

Similar suggestions were made concerning the improvement of sweet potato and maize minikits in all zones. Farmers in Njala and Kenema zones were especially concerned with the inadequate quantity of sweet potato planting material. Maize seeds were also seen as "too little" by some farmers. At least several farmers in all five zones commented about the importance of receiving planting material on time, when they were ready to plant. There was little variation in suggestions by farmers for improving the minikits.

VIII. MINIKIT DISTRIBUTION, USE AND MAINTENANCE BY ECOLOGY

A. Distribution of Minikits by Ecology

As shown earlier in this study, the majority of the respondents of the sample were upland farmers (71.5%). Inland valley swamps (IVS) represented 21.5% of the respondents, while only 5.5% were mangrove and 1.5% were boliland farmers. Thus the results in this section will largely focus on farmers in upland and IVS ecologies.

Since upland farmers are more numerous and the upland ecology more popular among farmers, they received most of the minikits distributed. The data revealed, however, that a larger proportion of IVS farmers (68.2%) received rice minikits without fertilizer than upland farmers (41.6%). Conversely, a greater proportion of upland farmers (58.4%) received rice minikits with fertilizer, compared to IVS farmers (31.8%). This was also true for maize minikits. Little difference was found in the case of sweet potato and cassava minikits, where similar proportions of farmers received these minikits without fertilizer. Thus there was little difference in overall distribution of minikits among IVS and upland farmers. There were significant differences in the contents of rice and maize minikits - upland farmers received rice and maize minikits more often with fertilizer than did IVS farmers.

B. Minikit Maintenance by Ecology

The data also revealed that IVS respondents of the sample showed a slightly greater tendency to maintain planting material from their rice,

sweet potato and maize minikits, whereas upland farmers showed a slightly greater tendency to maintain planting material from their cassava minikit. These differences were not great, however.

C. Reported Yield and Income Benefits of Minikits by Ecology

A slightly greater proportion of IVS farmers felt that rice and cassava minikits would help increase their yields. No difference was found between these two ecologies when sweet potato and maize minikits were compared. Overall, the majority of the respondents in all zones felt that their yield had increased much as a result of using the minikits.

When considering income, greater proportions of IVS farmers reported that rice, cassava, sweet potato and maize minikits had helped to increase their income very much, when compared to upland farmers. When the annual incomes of respondents from these two ecologies were compared, the data revealed that the annual incomes of IVS farmers were higher than that of upland farmers. Thirty-one percent of the IVS farmers reported incomes of 2,000 leones or more, compared to 21 percent for upland farmers. Also, 79 percent of the upland farmers had incomes below 2,000 leones, compared to 69 percent for IVS farmers. Thus it appears that IVS farmers were realizing greater income benefits from the minikits they received compared to upland farmers.

D. Reported Problems With Minikits by Ecology

The most common problems which farmers of all ecologies had in adapting the minikits to their farming environment were pest control

(damage by rodents), weed control and birds. The range of problems experienced by farmers who received minikits varied more by the type of minikit than by ecology. In other words, different types of crops tend to experience greater problems with different types of pests. In addition, a wider range of problems were reported by farmers who received cassava, sweet potato and maize minikits, compared to those receiving rice minikits. The problems reported by the respondents in using different types of minikits are shown in Table 40.

E. Farmers' Suggestions on Minikit Improvement by Ecology

Farmers from IVS and upland farms generally gave similar suggestions on how the minikits could be improved. Some of the more common responses were: need more fertilizer; need more seed and planting material; need more minikits; timely arrival of planting material; and pest control. Other problems mentioned were lack of tools for cultivation, need for more instruction, and need for credit. Most of the improvements suggested were reported by upland and IVS farmers. The distribution of responses by type of improvement, type of minikit and ecology is shown in Table 41.

IX. AGE AND SEX AS RELATED TO MINIKIT DISTRIBUTION AND USE BY ECOLOGY

This section includes the results of the analysis of age and sex by ecology. The following conclusions are based on the data collected on these variables.

1. In all ecologies, older farmers tended to receive higher incomes than younger farmers.
2. In all ecologies, older farmers tended to receive more minikits of all types than younger farmers.
3. Age was not a discriminating factor in receiving minikits with or without fertilizer in all ecologies.
4. Older farmers had a slightly tendency than younger farmers to receive more than one rice, cassava, sweet potato or maize minikit.
5. There were no differences between younger and older farmers, in terms of ability to maintain planting material from the minikits.
6. There were no differences in age and level of yield reported from use of minikits.
7. There were no differences in age and level of income reported from use of minikits.
8. Farmers of all ages reported that minikits contributed more to increased yield than increased income.
9. There were no differences in age and type of problems experienced in using minikits.
10. There were no differences in age and type of improvements recommended for minikits.

Table 40. Major Problems Reported by Respondents in Using Minikits by Ecology

Problem	IVS				Upland				Mangrove				Boliland			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Rodents	X	X	X	X	X	X	X	X			X			X	X	X
Weeds					X	X	X	X								
Theft																
Birds	X				X											
Monkeys			X	X			X	X			X					
No Tools																
No Fertilizer							X					X				
Goats			X			X	X									

Type of Minikit: 1 = Rice; 2 = Cassava; 3 = Sweet Potato; 4 = Maize

Table 41. Major Improvements Needed in Minikits Reported by Respondents by Ecology

Improvement Suggested	IVS				Upland				Mangrove				Boliland			
	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
More Fertilizer	X	X	X	X	X	X	X	X		X	X	X			X	X
More Planting Material	X		X	X	X	X	X	X	X		X	X				
More Minikits	X	X	X	X	X	X	X	X						X	X	
Pest Control	X	X	X		X	X	X	X								
Timely Arrival of Planting Material		X	X	X	X		X									
Better Varieties									X	X					X	
Credit			X													

Type of Minikit: 1 = Rice; 2 = Cassava; 3 = Sweet Potato; 4 = Maize

11. There was no difference between sex and type of farming ecology. Similar proportions of females and males were upland farmers (76.7% and 70.6%) and IVS farmers (21.4% and 21.5%). There were only six male boliland farmers and no female boliland farmers in the sample.

12. There was moderate difference between the income levels of males and females. A larger proportion of males were represented in the highest income category - 3,000 leones and over (25.5%), compared to females (16.0%); 56.1% of the males and 66.1% of the females were represented in the lowest income category - less than 1,000 leones yearly.

13. There were no differences in sex and the number of rice, cassava, sweet potato, or maize minikits received with and without fertilizer.

14. A much larger number of males received minikits (343) than females (56).

15. There were some sex differences in the type of minikit received. A greater proportion of females (58.34%) received sweet potato minikits than males (48.2%), compared to 26.4% and 18.8% for maize minikits, respectively for females and males. These discrepancies are not seen as great, however.

16. There were no differences in the temporal distribution of minikits between males and females.

17. There were no sex differences in ability to maintain cassava, sweet potato and maize planting material from minikits. However, males showed a greater tendency to maintain planting material from rice minikits than females.

18. There were no sex differences in reported yields and income from minikits received.

19. There were no sex differences in type of problems reported in using minikits. However, males reported a wider range of

problems than females.

20. There were no sex differences in type of improvements recommended for minikits. However, males cited a wider range of improvements. Female respondents were concerned with receiving more fertilizer.

X. SUMMARY OF FINDINGS

The purpose of this study was to assess the impact of the ACRE minikit program on crop production and farming practices for a sample of 400 farmers who received minikits between 1981 and 1985. The ACRE objective of the minikit program was to provide direct farming benefits to 20,000 farm families by providing them with small technology packages consisting of improved seed and planting materials and production techniques. These small technology packages were referred to as minikits.

Project officials estimated that over 20,000 farmers had received minikits. However, at the time this study was conducted, a list of the total number of farmers who received minikits was not available. Thus, the sample for this study was drawn from a list of 12,500 farmers whose names were on record as having received minikits.

Keeping records of who received what type of minikit seems to be a simple task. However, the maintenance of such a large volume of records requires close monitoring if the records are to be complete and accurate. In addition, there must be a good system of reporting and filing. Only if this is done can an assessment of results of the minikit program be made.

An investigation revealed that complete records of the minikit program were not available at the time. Thus it was not possible to determine if the goal of providing minikits to 20,000 farmers had been reached. The investigation also revealed that many contact farmers issued planting material to other farmers for which no records were

available. Records were also incomplete on the number of minikits issued to schools, agricultural agencies, governmental agencies, paramount chiefs, village chiefs or section headmen. In most instances the type of minikit issued to the farmers was not recorded.

Twenty-nine percent of the farmers received more than one minikit. This limited the total number of farmers who could have received at least one minikit. However, since no clear objectives were evident, as to the number of minikits that each farmer was to receive, the meaning of these statistics cannot be fully assessed. The apparent explanation is that many farmers who requested an additional minikit and who expressed interest in the program received more than one minikit.

Just over three-fourths of the farmers sampled received minikits without fertilizer. This means that they received incomplete packages. Whereas the total effects of this factor cannot be determined, it is apparent that lack of fertilizer would limit potential crop yield. However, when number of minikits received was cross-tabulated with crop yield, no significant differences were obtained. Apparently the quantities of fertilizer and planting material were so small as to not have an appreciable effect on yield. Moreover, farmers may or may not have obtained fertilizer from other sources. The distribution of minikits without fertilizer was more prevalent for sweet potato and maize minikits. Sweet potato minikits comprised one-half of the minikits distributed to the farmers of the sample.

Minikit distribution reached a peak between 1983 and 1984. The most common crop varieties included in the minikits were Rok 16 rice,

Rocass cassava, Ropot 2 sweet potatoes and Western Yellow maize.

The Extension Instructor delivered the vast majority of the minikits, usually in homes, in village meetings or on the farm.

The majority of the farmers reported no difficulty in understanding the instructions included in the minikit packages. This was most likely due to the assistance they received from the Extension Instructors who provided information and demonstrations in some instances.

The majority of the respondents reported that they were able to maintain seed and planting material from the minikits for two to three years. Farmers were better able to maintain cassava and sweet potatoes compared to maize and rice. A series of problems which farmers reported may have limited their ability to maintain planting material from the minikits in the long run, including: destruction by disease and pests, lack of technical knowledge and resources, part-time farm work patterns, and lack of effort.

The farmers in the sample were very positive toward all types of minikits they received. They felt that the minikit program helped to increase their crop yields and incomes. However, they were more positive toward yield benefits than income benefits. Only 13 percent of the respondents sold at least some of their rice for cash income. Generally, farmers reported that rice minikits were more valuable in helping to increase their income.

Well over two-thirds of the respondents reported that using the minikits was costly, especially in terms of labor requirements and fertilizer needs. Many farmers reported that "time-saving" was not a major

attribute of the minikits they received, but was less of an advantage when using rice minikits, compared to sweet potato, cassava and maize minikits.

Farmers experiened difficulty in controlling the biological and physical environment when using minikits. Thus they more frequently cited problems related to pest control (rodents, monkeys, birds, goats, etc.) and weed control.

Farmers more frequently cited the following ways in which minikits could be improved: include more fertilizer; include more seed and planting material; help with pest control; and receiving seed and planting material on time for planting.

The number of minikits of a specific type which farmers received varied by zone. A relatively larger proportion of farmers in Rokupr Zone received rice minikits. Makeni Zone led in proportion of farmers who received cassava and sweet potato minikits and Njala Zone led for maize minikits.

The number of farmers who received minikits without fertilizer far outnumbered those who received minikits with fertilizer by a ratio of 2.5 to one. The proportion of farmers who received two or more minikits without fertilizer was highest in Makeni, Rokupr and Njala zones and lowest in Kabala Zone.

No zonal differences were found in ability of farmers to maintain seeds and planting material from their minikits from year to year. Two years were the modal response. No zonal differences were found in reported increases in crop yield for minikits received by respondents.

This was also true for reported increases in income derived from the use of minikits. However, respondents in all zones were less positive about derived increases in income, compared to increases in crop yield, as a result of using minikits.

Zonal responses of problems with minikits were very similar. The most common problems which farmers of all zones reported when using minikits was pest control and weed control. A wide range of suggestions for improving the minikits was reported by farmers of the five zones. The major suggestions included: packages should include more fertilizer and planting material and receiving planting material on time.

The number and type of minikits received varied by ecology. A larger proportion of IVS farmers received rice minikits without fertilizer while a greater proportion of upland farmers received rice minikits with fertilizer. This was also true for maize minikits while little differences were found for sweet potato and cassava minikits when ecology was considered.

IVS farmers showed a slightly greater tendency to maintain material from their rice, sweet potato and maize minikits than upland farmers.

Slightly larger proportions of IVS farmers reported high increases in yields and income derived from the use of minikits, compared to upland farmers. The data also revealed that the reported annual incomes of IVS farmers were higher than that of upland farmers.

No differences were found among the zones in problems experienced in the use of minikits and in type of recommendations for improving the minikits. The major problems encountered were pest control and weed control. The major recommendations for improving the minikits were:

include more fertilizer and planting material and deliver planting material on time for planting.

Minikit distribution varied by age in all ecologies. Older farmers tended to receive more minikits of all types than younger farmers. Older farmers also reported higher annual incomes than younger farmers in all ecologies.

No differences were found between age and fertilizer contents of minikits, ability to maintain planting material from the minikits, increase in yield, increase in income, type of problems experienced, and suggestions for improvements, respectively.

No differences were found between sex and fertilizer contents of minikits, ability to maintain planting material from the minikits, increase in yield, increase in income, type of problems experienced, and suggestions for improvements, respectively. Female respondents received lower annual incomes than males. Females were more likely to receive sweet potato minikits than males, however, the difference was not great.

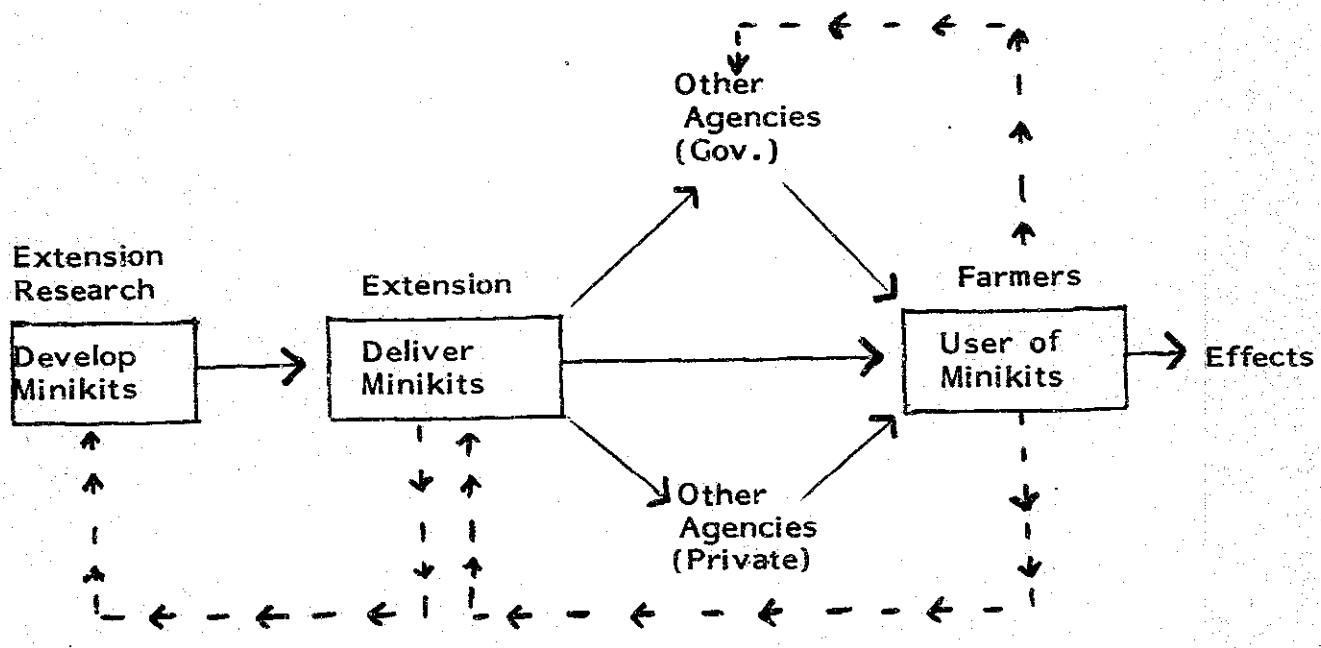
XI. CONCLUSIONS

This study found that the minikit distribution program was a sound concept used for assisting farmers in upgrading their crop varieties and improving their farming practices. The development, delivery and use of the minikits, as diagrammed in Figure 1, seems to be an effective system for helping farmers to improve their farming techniques and increase their yields. The system is basic and simple to understand and use.

A major strength of the minikit program is that it delivered small scale appropriate technology packages to farmers in their local setting, where instructions on use, farming information and demonstrations could be made, in many instances in the farm setting. This also permitted close contact between Extension Instructors and the farmers and their families.

The farmers who received minikits were very positive toward the minikit program. They wanted the minikit program to be expanded to include more farmers and include larger quantities of fertilizer and planting material.

Figure 1. Interrelated Components of the Minikit Distribution Program



Overall, the minikit program was having a positive impact on farmers adoptions of small scale appropriate technology. Although farmers reported they benefited from increased yields and incomes, changes in this regard were small.

The quantity of planting material and fertilizer included in the minikits was very small. Not all farmers received minikits. Many minikits were received without fertilizer. The demand for minikits greatly exceeded supply. And there were too few Extension Instructors to provide adequate instructions and necessary follow-up to all farmers who received minikits. It is most likely that these factors minimized the impact and effectiveness of the minikit distribution program.

Other factors which limited the effectiveness of the operation of the program were: (1) no initial clear and specific objectives were developed in terms of expected outcomes (e.g., production and level

of farm development expected), amount of information to be provided, and number of follow-up visits of farmers who received minikits. Except for the goal of providing minikits to 20,000 farmers, no clear and precise guidelines were developed as to how the success of the program would be measured. There was also indication that the program could have been more closely monitored and more accurate record-keeping was needed. The potential of creating dependency of farmers upon free seeds and planting material should be addressed. In the long run, community seed multiplication and distribution cooperatives could be developed where farmers who are financially able can purchase improved crop varieties for a small fee. Such self-help efforts could contribute to the development of more independent and self-sufficient farm enterprises whose chances of survival may be better in the long run.

APPENDIX

A. Zones (N=5), Chiefdoms (N=24), and Villages (N=79) Included in Sample

I. Rokupr Zone

Tonko-Simba Chiefdom

1. Mile 14
2. Mathontoa
3. Mathathoe
4. Mathatoi
5. Numeya
6. Mabanda

Magbema Chiefdom

1. Funkunya
2. Royokneh
3. Kamba
4. Gbonko-Pere
5. Manumpu
6. Gbereka
7. Moribaya

Samu Chiefdom

1. Lungi
2. Rosinor
3. Mafufuneh

II. Njala Zone

Dasse Chiefdom

1. Mano
2. Mogombi

II. Njala Zone

Korie Chiefdom

1. Gboworbu
2. Gbuihun
3. Kowama
4. Taiama

Kagboroh Chiefdom

1. Makende
2. Moyema

Kaiyambo Chiefdom

1. Moyogba
2. Moyamba
3. Pelewahun

Fakunya Chiefdom

1. Gandorhun
2. Kwellu

III. Kenema Zone

Dama Giema Chiefdom

1. Kganbedu
2. Bakaa
3. Mano Njeigbla
4. Giema

III. Denema Zone (Cont'd)

Dama Giema Chiefdom

5. Golahun
6. Gbonjeima
7. Gao
8. Korma

Dodo Chiefdom

1. Kpaima
2. Dodo

Lower Bambara Chiefdom

1. New Kambama
2. Gondoma

Nongowa Chiefdom

1. Jormu
2. Konabu
3. Neikabu
4. Gbenderu
5. Sami-Folluma

IV. Kabala Zone

Kasunko Chiefdom

1. Kafoko
2. Thankorosidia

F/Dembelia Chiefdom

1. Koromasilia

Sengbe Chiefdom

1. Sengbekeloroh
2. Bendugu
3. Gbenikoro
4. Forenorya

Wara Wara Chiefdom

1. Yataia
2. Kanunka
3. Heremakonoh
4. Mile 8
5. Kasorie
6. Makakura
7. Kamasokola
8. Lengekoro

V. Makeni Zone

Makarie Gbanti Chiefdom

1. Domadina
2. Massapirie
3. Yelisande
4. Mile 3
5. Manenkri

Sofroko-Limba Chiefdom

1. Bombali Bama
2. Kaothala
3. Sawulia

V. Makeni Zone (Cont'd)

Biniwa Chiefdom

1. Kamawaray

Seborah Chiefdom

1. Makump

Kholifa Chiefdom

1. Magburaka
2. Magbonto
3. Malon

Tane Chiefdom

1. Mabump
2. Mathankay

B. Schedule of Activities Performed

20 May 1986	Briefing on consultancy for AID Affairs Officer and ADO, Freetown.
21 May	Planning and preparation for data collection in field; obtaining supplies/resources and field workers.
22-25 May	Data collection in Rokupr Zone.
26 May	Supervision of coding at Njala.
27-29 May	Data collection in Njala Zone.
30-31 May	Supervision of data processing at Njala.
1-3 June	Data collection in Kenema Zone.
4 June	Field preparation and data processing at Njala.
5-6 June	Data collection in Kabala Zone.
7-8 June	Data collection in Makeni Zone.
9-12 June	Data processing at Njala.
10-11 June	Preparation of report at Njala.
12 June	Consultancy debriefing for SULSU and ACRE staff at Njala.
13 June	Consultancy debriefing for AID Affairs Officer and ADO, Freetown.
15 June - 30 August	Data processing, analysis, interpretation, and preparation of final report.

C. Research Expenses for Minikit Study: 22 May to 12 June, 1986

1. Personnel	Days	Leones
Field Supervisor & Enumerator		
a. Salary (Le 50/day)	16	800
b. Per Diem (Le 25 day)	13	325
c. Bonus (2 gals. petrol)		250
Enumerator (1)		
a. Salary (Le 10/day)	16	160
b. Per Diem (Le 10/day)	13	130
c. Bonus		100
Enumerator (2)		
a. Salary (Le 10/day)	16	160
b. Per Diem (Le 10/day)	13	130
c. Bonus		80
Enumerator (3)		
a. Salary (Le 10/day)	8	80
b. Per Diem (Le 10/day)	7	70
c. Bonus		60
Enumerator (4)		
a. Salary (Provided by ACRE)	16	–
b. Per Diem (Le 10/day)	13	130
c. Bonus		90
Enumerator (5)		
a. Salary (Provided by ACRE)	4	–
b. Per Diem (Le 10/day)	4	40
c. Bonus		30
Drivers (3)		
a. Salary (Provided by ACRE)	16	–
b. Per Diem (Le 6/day)	16	96
c. Bonus		30

	Leones
2. Transportation	
5 gals. diesel @ Le 10/gal. at Rokupr Res. Stat.	50
100 gals. diesel @ Le 7.30/gal.	730
22 gal. petrol @ Le 8.30/gal.	182.60
Boat fee: Enumerator & E.I. at Rokupr	36
Delivery of Minikit list from Kabala	104
8 gals. diesel @ 7.50/gal. at Kenema, IADP	60
3. Supplies	
Padlock for vehicle Sm1783	14
Candles (3)	4.10
Medicine	25
Shelltox	14
12 penciles (SULSU in kind)	-
Four writing pads "	-
Stencils & paper "	-
4. Coding	
Coder (1)	
a. Salary (11 days @ Le 20/day)	220
b. Overtime (15.5hrs.)	60
c. Bonus	50
Coder (2)	
a. Salary (11 days @ Le 20/day)	220
b. Overtime (13.5) hrs.	50
c. Bonus	30
Coder 3	
a. Salary (3 days @ Le 10/days)	30
b. Overtime (19.75 hrs)	40
c. Bonus	60
Coder 4	
a. Salary (5 days @ Le 10/day)	50
b. Overtime (12.5 hrs.)	30
c. Bonus	50

	Leones
Coder (5)	
a. Salary (5 days @ Le 10/days)	50
b. Overtime	15
c. Bonus	40
Coder (6)	
a. Salary (2 days @ Le 10/day)	20
b. Overtime (1.5 hrs.)	5
c. Bonus	10
Coder (7)	
a. Salary (3 days @ Le 10/day)	30
b. Overtime (3 hrs.)	10
c. Bonus	50
5. Miscellaneous	
a. Typist	100
b. Fix flat at Rokupr	6
c. Ball destroyed by vehicle driver at Rokupr	20
TOTAL COSTS	Le 5,226.70

D. Cost Per Interview = Le 3923.60 ÷ 400 = Le 9.81

E. Summary of Research Costs

1. Data Collection	Le 2761.00
2. Fuel & Transportation	1162.60
3. Data Processing/Coding	1120.00
4. Miscellaneous	126.00
5. Supplies	57.10
Total	Le 5226.70

F. Research Travel Itinerary: Vehicle No. SM 1783 (Jeep)

Date	From	To	Start	Finish	Kilometers
22 May	Njala	Mokonde/Rokupr	453	748	295
23	Rokupr	Rokupr Zone	748	995	247
24	Rokupr	Rokupr Zone	995	1073	78
25	Rokupr	Njala	1073	1344	271
26	Njala	Bo	1344	1490	146
27	Njala	Njala Zone	1490	1563	73
28	Njala	Njala Zone	1563	1750	187
29	Njala	Njala Zone	1750	2119	369
30	Njala	Njala/Mokunde	2119	2148	29
31	Njala	Taiama/Kenema	2148	2250	102
1 June	Kenema	Kenema Zone/Njala	2250	2410	160
2	Kenema	Kenema Zone/Njala	2410	2650	240
3	Kenema	Kenema Zone/Njala	2650	2864	214
4	–	–	–	–	–
5	Njala	Kabala	2864	3215	351
6	Kabala	Kabala Zone	3215	3349	134
7	Kabala	Kabala Zone/Makeni	3349	3514	354
7	Makeni	Makeni Zone	3514	3668	154
8	Makeni	Makeni Zone/Njala	3668	3871	203
9	Njala	Njala	3871	3911	40
10	Njala	Mosongo/Njala	3911	3921	10
11	Njala	Njala	3921	3930	9
12	Njala	Njala	3930	3945	15
13	Njala	Freetown	3945	4185	240
14	Freetown	Njala	4185	4425	240
		Total			4161 kilos
					(2497 miles)

G. Kilometers and Fuel Usage by Zone

Zone	Kilos	Diesel	Petrol	Total Cost (Leones)
Rokupr	891	25	5	224.00
Njala	629	12	3	112.50
Kenema	716	20	4	179.20
Kabala	614	25	4	215.70
Makeni	582	15	5	151.00
Total	3432	97	21	Le 882.40

H. Petrol Allocations to E.I.'s for Field Work (Gallons)

Rokupr Zone

M. Kargbo 1.5

J. B. William 1.0

J. T. Lappia 1.5

S. E. K. Harding 1.5

F. E. A. Lahai -

A. B. Mansaray 1.5

Kabala Zone

A. B. Koroma 0.5

J. Lappia 0.5

M. Sheriff 0.5

C. Gassama 0.5

M. Ngaina 0.5

M.P. Turay -

A. Y. Sesay 0.5

K. Sesay (CEO) 1.0

Makeni Zone

D. K. Kai 1.5

M. Bah 0.75

J. Tarawalie 0.75

F. A. Mansaray 0.5

K. A. M. Bayo 0.5

S. C. Pierce 0.5

D. K. King 0.5

Njala Zone

P. Jusu 1.5

A. Allieu 0.5

L. Jabati -

P. Allie 1.0

O. Wai -

D. Pewa 0

Kenema Zone

J. Momoh 1.5

H. Sillah 0.5

Ganawah 1.0

L. Saffa 1.0

XI.

A.C.R.E. PROJECT
MINIKIT SURVEY
QUESTIONNAIRE

May 1986

Schedule # _____ Date _____ Interviewer _____

Name of Farmer _____ Village _____ Chiefdom _____

Zone _____ Ecology _____

	Rice	Cassava	Sweet Potatoes	Maize	Fertilizer
1. How many minikits have you received?	_____	_____	_____	_____	_____
2. Year first received	_____	_____	_____	_____	_____
3. Variety(s) received	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
	_____	_____	_____	_____	_____
4. From whom did you receive the kit?	_____	_____	_____	_____	_____
5. Where you received kit? (home, Meeting, Field day, etc.)	_____	_____	_____	_____	_____
6. Did you understand the instructions on how to use this?	_____	_____	_____	_____	_____
7. Who read or helped you to understand the instructions on how to use this?	_____	_____	_____	_____	_____
8. How long have you been able to maintain and reproduce planting material from the kit (years)?	_____	_____	_____	_____	_____
9. Would you like to continue using this?	_____	_____	_____	_____	_____

Schedule # _____

16. Extent which this has increased your yield? (little; some; much) _____ _____ _____ _____ _____

17. Extent which this has increased your income? (little; some; much) _____ _____ _____ _____ _____

18. Major problem in using this? _____ _____ _____ _____ _____
_____ _____ _____ _____ _____
_____ _____ _____ _____ _____

19. In what way do you think the minikits can be improved? _____
_____

20. How many farmers you know have received and used minikits? _____

21. Do you know an ACRE contact farmer? ____ How many times have you received information from him? _____ planting material? _____

22. Age (exact or estimate) _____ 23. Sex _____

24. Marital status: Married ___; Single ____; Widowed or Divorced _____

25. Number of Wives ____ 26. Number in household: Adults _____ Children _____ 27. Education: no formal ____; 1-3 years primary _____; 4-7 years primary _____ Secondary _____; Arabic _____; Other _____.

28. Years in farming _____ 29. Farm size: Amount of rice seeds grown in 1985 _____.

30. Amount of hired labour used: # persons _____; # of days _____; # of hours per day _____.

31. Number of family members who work on farm (Include farmer) _____

32. Total bushels of rice produced in 1985 _____. 33. Amount sold _____.

34. Amount traded _____ 35. Amount given away _____

36. Where and to whom did you sell your rice (be specific) _____

37. Distance of where you sold your rice from where you live (miles) _____

38. Total income for 1985, estimate based on amount of yield _____