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EVALUATION  
OF  
THE ADAPTIVE CROP RESEARCH  
AND EXTENSION

SIERRA LEONE

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## PREFACE

This evaluation report of the Adaptive Crop and Research and Extension project of Sierra Leone is the result of a three-week effort of a team of direct hire personnel supplied by REDSC and USAID Washington.

It was conducted in cooperation with the GOSL ACRE project personnel, Ministry of Agriculture and Forestry representation, Njala University College Staff, SUSLU contract staff and participation of the project manager USAID/SL.

The contents of the report have been organized to follow AID 1330-15A (3-78) Project Evaluation Summary (PES) Part II.

Annexes to this report provide detailed explanations, discussions and proposals relating to issues cited in the report.

The evaluation team would like to thank the many small holders and cooperative farmers who extended hospitality to the team and were kind enough to discuss their preceptions during the evaluation.

Further the team would like to express its appreciation to the Sierra Leone ACRE project staff. Njala University College staff and the Ministry of Agriculture and Forestry for their efforts in providing an insight in project activities. The team would like to thank the contract team of SULSU for their discussion of problems and critical issues involving project management and implementation.

The team is also gratified for the guidance and cooperation so readily extended by the USAID/SL.

## Executive Summary

### General Conclusions and Recommendations

The Sierra Leone Adaptive Crop Research and Extension project was designed to develop an adaptive crop research and technology transfer system which would serve the needs of the rural agriculturists by increasing their productivity, income and nutritional status.

The project was to be implemented through the Ministry of Agriculture and Natural Resources and Njala University College. It was to utilize to the greatest extent the existing staff and facilities of both organizations. The Project was established with a five year time frame. The Project Paper mentions a longer program (10-15 years) which is usually required to develop a viable self-sustaining agricultural research and technology transfer-institution.

1. The evaluation team found that considerable progress is being made in each of the output areas.
2. Sierra Leoneans are being trained in adaptive crop production research.
3. The staff as planned has been recruited and has developed a program of work which involves on the farm adaptive research trials.
4. The Sierra Leonean staff which have been recruited are well qualified, competent professional people

The evaluation team witnessed the function of farm families in the early stages of development of a technology transfer system. The question that is central to the assessment of the

future success of the project is how the project will operate to bring other farm families into the system and sustain and promote farm family participation in future project activities.

The evaluation team concluded that the ACRE project has contributed several positive elements toward the long-term development and expansion of agricultural output in Sierra Leone. Small holders in the project area are asking for assistance. There is a critical need for the project to develop strategy to extend their ~~300~~ services beyond its present scope.

At the time of the evaluation, project staff morale was generally high. There was a deep concern however among GOSL employees in respect to salaries and other conditions. Several important members of the staff have opt to leave the project and Sierra Leone for more attractive salaries. The employment of new staff has been hampered by salary consideration.

Problems with the electrical services as well as water supplies at the ACRE project headquarters could seriously affect the future of the project.

At the present time the full time local staff of the project are employed by the Ministry of Agriculture and Forestry. Additionally the project employs some fourteen faculty members of the University of Njala on a part time basis.

The USAID contract team from-SULSU-consists of 5 team members who are well-trained and qualified professional agriculturists. The delay of recruitment of the Extension Agronomist has seriously

hamp<sup>u</sup>pered the project and delayed the effectiveness of his future work.

It appears that the management (ACRE local staff, contractor University of Njala) have found it difficult to ~~coalise~~<sup>FSOC</sup> efforts in directing and guiding the project for establishing a unified approach in planning and implementing activities. This was discussed at length during the evaluation and it is hopeful that steps will be taken to insitutionalize the project.

On effective integration of financial management tools and procedures into project administration is lacking. At present the accounting system cannot provide timely and useful information for project decisionmakers or other personnel monitoring project progress. A primary cause of this deficiency is the absence of discussion of or budgeting for accounting and financial personnel in the Project Paper. The establishment and maintenance of an improved financial management system is particularly critical given the magnitude of USAID and GOSL contributions. Total USAID authorized life of project funding is \$6,100,000. In addition as per 1982 CP an additional \$943,000 has been reserved for ACRE. The GOSL has made \$3,866,000 available for ACRE Project use. A breakdown of ~~USIAD~~<sup>USAID</sup> and GOSL contributions by fiscal year and by input is given <sup>in</sup> Appendix ~~B~~<sup>C</sup>. A breakdown of USAID contributions including the reserved \$943,000 is in Appendix ~~B~~<sup>C</sup>.

## Summary of recommendations for Adaptive Crop Research and Extension Project

### Recommendations for GOSL ACRE Project

1. Give high priority to the further establishment of the nutrition component of the project, its staffing and implementation.
2. Develop approved terms of service for ACRE project staff. These terms should be equal to other project activities.
3. Develop a vehicle repair, maintenance and replacement program.
4. Implement intra-African long term training program.
5. Complete selection of candidates for long term training program.
6. Formally consider abolishing the present base-line survey. Initiate more relevant studies of farm management nature using trained extension personnel.
7. Carefully analyze energy needs of research laboratory and seed processing plant. Develop alternatives in event that analysis indicates lack of cost-effectiveness.
8. Plan and execute provisions to assure adequate water and utilities to all of Njala housing and headquarters. This should include provisions for short run - medium and long term basis.
9. The ACRE project accounting staff should produce quarterly financial statements. Initial quarterly

statements should be done with the assistance of the accounting firm contracted to assist ACRE and subsequent statements should be reviewed by the accounting firm after preparation. In addition input utilization projections and cash flow analysis should be instituted.

10. Project financial statements should be produced annually which combine AID and GOSL contributions into one statement.
11. The position of Chief Accountant which has remained vacant for seven months should be filled as soon as possible. The candidate selected must have a university degree in a financial area and preferably several years of experience in an accounting or finance position. The Chief Accountant must work as a financial manager and planner.
12. The accounting staff should be increased to include at least one additional Accounts Clerk. This person need not possess an academic background in accounting but should have at least two years experience as an account clerk.
13. Bank accounts should be opened in each zone to be used for payroll disbursement. The account can be the responsibility of the zonal senior extension coordinator or when feasible because of location individual employees in a zone may have their paycheck deposited to individual accounts.

14. Develop and implement a mid term to end of project commodity procurement plan.
15. Develop with contract team leader regularly scheduled and planned staff meetings.
16. Introduce appropriate technology and labor saving techniques into crop production demonstrations.  
Consultant may be required.
17. Organize and implement a rice production contest for farmers.
18. Recruit a public information and communication specialist. If none available recruit trainee.
19. Insure that contract research and extension staff are integrated into project programs. Designate counterparts or work groups which insure staff cooperation.
20. Strengthen linkages with IITA and other research and extension institutions. If possible develop a formal agreement with IITA for training and or research and extension resource materials.
21. Develop a yearly program of work as well as a schedule of activities to facilitate timeliness of project works.
22. Develop a formal agreement between Ministry of Agriculture and Forestry and the Njala University College to institutionalize the ACRE project.
23. Investigate animal power sources, including the water buffola, to increase agriculture productivity, improve transportation and reduce labor constraints.

## Recommendations for USAID Sierra Leone

1. - Develop supporting program which will meet the needs of the ACRE program but which are currently beyond its scope i.e. agricultural marketing roads, credit.
2. - Carefully monitor the logistical support which is to be furnished by USAID to the contract team. This includes housing, utilities, furniture and household equipment as well as in-country transportation. It has come to the attention of the evaluation team that there are shortages in furniture and household equipment as well as utilities. At present there are also deficiency<sup>ies</sup> in in-country transportation for official or duty travel.
3. USAID should monitor the project in relation to the letter and intent of the project design. Specifically, AID should promote the institutionalization of the project to include MAF, Njala University College and ACRE project.
4. Promote the establishment of functional linkages between research extension and farmers.
5. Send copies of all project financial reports to ACRE accounting office.

## Recommendation for Contract Staff in Sierra Leone

1. Hold regular staff meetings with pre-planned agendas
2. The contract team leader should acquire an administrative assistant to assist in many of the ~~mundane~~<sup>tasks</sup> of running the project.
3. In cooperation with the ACRE Director develop an assignment of project vehicles which allows for ~~more~~ judicious use.
4. Each staff member should develop a yearly program of work which is intergrated with Sierra Leone counterparts or research and extension teams.
5. Contract team members should carefully review adaptive research and demonstration trials plans with research and extension personnel.

## Recommendations for SULSU Contract Administration

1. Develop annual report as well as required six months report and distribute copies to USAID as well as project team leader.
2. Develop more effective procedures for using consultants. Insure sufficient length of stay in Sierra Leone as well as development of report before leaving project.
3. Develop annual work plan.
4. Develop better communication to inform contract staff in Sierra Leone on progress of requests for consultants as well as hard ware needs of project.
5. Arrange for petty cash to be used for purchase of small items in support of consultants.
6. Insure complete instruction to contract staff on travel arrangements, custom clearances, visa requirements and inoculations.
7. Give special attention and expedite quickly critical needs of contract staff in respect to family living and project problems.
8. Implement project evaluation as required.
9. Send copies of all project financial reports to team leader

## Evaluation Methodology

The Mid-Term Evaluation team based their analysis on the following information:<sup>1)</sup> review of project and non-project documents; 2) observation of physical facilities, research sites, and on-farm trials and demonstrations; 3) participation in meetings and conducting structured and instructured interviews with GOSL, IADP, NUC, ACRE, AID, and U.S. contract ACRE Project officials and with farmers and other residents of rural zones (see appendix A ).

Basically, project planning documents and contractual agreements and the goals and structures called for in those documents were compared to project performance. The Evaluation Team established and continually revised sets of key questions on which to focus our work. This was done at all levels from inter-governmental to inter-institutional to infra-project to individual farm operations. Internal management and program monitoring documents were important in the review. Other documents reviewed concerned other development projects and socio-economic development in Sierra Leone. Interviews and meetings provided more information for assessing project performance in relation to stated goals. Dr. Hess used a structured interview to gather comparable information from a 10 percent random sample of contact farmers in the project. Observations and preliminary conclusions were discussed with all key project staff, the U.S. contract team, and the MAF representatives to establish the best way to present the evaluation report.

The external evaluation team included the following:

Charles Simkins	ST/AGR	Team Leader/Agricultural Specialist
Graham Thompson	REDSO/WA	Evaluation Officer
David Hess	REDSO/WA	Economic Anthropologist
John Cloutier	REDSO/WA	Financial Analyst
Mellen Duffy	REDSO/WA	Nutritionist

Observers working full-time with the team included:

Wilbur Scarborough	USAID/SL	Agricultural Development Officer
Vernon Hall	SULSU	Contract Team Leader
E. J. Mammy	ACRE	Extension Co-ordinator
Lir-Me Feika	MAF	Asst. Chief Agriculture

## 2. External Factors

### 2.1 Labor Shortages,

The key constraints to increased agricultural productivity in Sierra Leone are labor shortages, market inadequacies, and price disincentives. Labor shortages are extremely limiting at crucial periods of the cropping cycle, notably landclearing and preparation, ~~planting (or transplanting in the case of IVS and Mangrove Swamp production)~~ weeding, and harvesting. Any attempts at increasing land under cultivation or intensifying labor input will exacerbate the problem of labor shortages. Rural to urban migration is a direct cause of labor shortage. Increase in labor drudgery could very easily lead to the decision by young rural people to migrate to urban areas. Agricultural production research in Sierra Leone must avoid as much as possible increasing labor demands.

### 2.2 Marketing INADEQUACIES

Marketing inadequacies and price disincentives in Sierra Leone relate basically to lack of transport and storage, and urban-biased pricing policies. Transport is a problem which agricultural ~~development projects, particularly the IADPs, are trying to solve.~~ Evidence from the NIADP indicates, unfortunately, that particular ~~project~~ has not chosen road sites for the purpose of inclusion of previously unconnected and economically promising areas in a road network to markets. Instead, it has spent a great deal of money on roads chosen for political expediency. In the future,

road construction should be done to provide access to markets to areas on the basis of economic return and social equity.

### 2.3- PRICE DISINCENTIVES

Pricing policies in Sierra Leone are biased to minimize discontent in urban populations. For example, rice prices are set at 8 leones a bushel which offers barely enough, or in some cases, not enough for a farmer to grow it, considering labor costs alone, without any inputs. No progress will be made in production if official price policy maintains this disincentive. Even in rural areas where official prices are relatively irrelevant because of the existence of parallel or private markets, price fluctuations are so marked that producers, at harvest time are forced, due to an inability to store harvests and the build-up of debts during the last part of the growing season, to sell at uneconomically low prices.

### 2.4. CREDIT DIFFICULTIES

Those seasonal debts are only part of the traditional credit structure which robs rural producers of the ability to achieve fair prices. Traditional credit provided by African or Lebanese merchants usually carries high interest rates and short deadlines for repayment. Credit programs through IADPs, though have been failures. Contrary, to the commonly held opinion that this indicates a lack of understanding of credit by rural people, this problem has two underlying causes. First, any government or government-associated credit program can be perceived as another in a long history of handouts. Second, repayment rates may be

calculated on over-optimistic production targets or inadequately tested technology so that, even if farmers wanted to repay, they would find it difficult if not impossible. Cooperative credit organizations are a possibility to solve these problems but managerial and accounting training and supervision are difficulties with these organizations.

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Recommendations

1. ACRE should focus its research and on-farm trials and demonstrations on varieties and techniques of production which do not increase demands on labor. Thus, among current work--dibbling, ridging, and closer and row planting should be reconsidered.
2. ACRE, as part of its future work in appropriate technology, should place primary emphasis on productivity improvement using labor saving devices. Further, work should be done on appropriate technology for crop storage for individuals and for groups, including possibly villages.
3. Future phases of ACRE may very well need to examine means of organization of farmers to deal with marketing and credit problems. Any work must rely on organizations genuinely based in interest and energy generated by farmers and not be imposed on them.

At the time of project design GOSL inputs were budgeted to compensate for an annual inflation rate of 15%. The actual inflation rates according to the World Bank for years 1979 and 1980 were 21% and 25% respectively. There are no indications that the 1981 rate will be less than that for 1980. Inflation has therefore had a significant impact on GOSL expenditures, (as well as AID local currency expenditures) particularly personnel and construction costs, which in many cases have risen faster than the overall inflation rate. The sharp increase in fuel and cement costs were major contributors. the construction cost overruns of over \$500,000.

On external factor with a favorable impact on the AID inputs financed by foreign exchange has been the strengthening of the US dollar relative to the leone during the past year. The increase in the exchange rate from 1.05 Le per dollar in 1980 to 1.15 at present has in effect increased the AID contribution to commodities, construction and support costs.

### ~~2.3~~ 3. INPUTS Technical Assistance

USAID has contracted the consortium of Southern University and Louisiana State University (SULSU) to work to integrate the agricultural research and extension services of the MAF and NUC, recommend project policy, assist in the creation of project programs and their implementation, and assist in training of local field staff in project operations. The contract team was to arrive at the beginning of the project and consist of (1)

Research/Extension Administrator (2) Agricultural Economics  
(3) Extension Agronomist (4) Soils Research (5) Cross Researcher.

USAID has contracted for 48 man-months for each of the five positions as well as 82 man-months of consultants.

The total input level for the SULSU contract is \$3,853,700 and is detailed as follows

Salaries	\$1,190,000
Fringe Benefits	161,100
Travel and Transportation	754,100
Allowances	579,500
Other Direct Costs	93,400
Indirect Costs	445,200
Training	630,400
	<u>\$3,853,700</u>

Of this amount USAID obligated \$340,000 in FY 78, \$610,000 in FY 79 and \$920,000 in FY 81 for a total of \$1,870,000. This is expected to be sufficient to meet SULSU's needs through December 31, 1981. See Appendix C for amounts already expended by SULSU.

An additional \$123,500 in non-SULSU technical assistance input has been contracted for accounting firm fees, secretarial services and consultancies.

Although the SULSU contract is in effect until December 31, 1983 it is clear that all the services contracted for will not be provided by that date. The late arrival of SULSU team members and <sup>the</sup> overall status of the project being behind schedule

have caused SULSU to be about one year behind schedule. The amount of unexpended budget items, particularly in salaries, fringe benefits, travel, allowances and training at December 31, 1983 will be about \$1,000,000. If there is additional project funding beyond that date or if certain contracted services such as consultancies or training are scaled down then part of the one million dollars <sup>which is included in the \$3.8 million SULSU contract</sup> could be used to finance other inputs which have been more costly than expected, particularly commodities and construction.

(For contract team)

The contract team from SULSU are well qualified, experienced and dedicated professional agriculturists. The Party Chief is one of the world's authorities on rice production. He is a capable leader and has many personal qualities which endear him to his colleagues. He works well with the Sierra Leone staff and keeps an even keel under often very trying circumstances.

The soils and crops researchers as well as the agricultural economist are experienced researchers who have good disposition to work under the conditions of Sierra Leone. They have accomplished much in the short time they have been on the project (6-10 months at the time of the evaluation.)

The crop researcher who has been on the staff only six months needs to expand his field of research to include a number of tropical crops in addition to his present excellent research on maize.

The most recent addition to the team is a well trained and qualified agricultural education specialist. His late arrival on the project as well as his lack of previous experience working as an extension agronomist will certainly be a handicap to him. However, his willingness to cooperate with others plus his obvious ability to adapt will no doubt make him a valuable member of the team.

Table 2-2 of the PP lists the original participant training schedule. Training was to be "front loaded", i.e. almost half the participants were to have started training by the end of year one. However, this was not accomplished. The AID/SULSU contract signed some fourteen months after the Pro. Ag. was signed specified that SULSU take the major initiatives in regard to participant training. This contract also provides the AID funds for the participants. (over \$630,000)

Participant training, particularly long-term, has slipped badly behind the plan in the Project Paper and the SULSU contract. Some or much of this slippage relates to the late contractor appointments but AID and the GOSL could have placed some participants and tentatively identified others before the TA contract was signed or at least before an active contractor team was at work.

The AID/SULSU contract specifies that trainees will be picked by a committee composed of the USAID Agricultural Officer, the ACRE Project Director, the SULSU Chief of Party and any other individuals the Agricultural Office suggests. This committee should be formally constituted and should meet quarterly. It would also be helpful to include an NUC rep. on the selection committee. This committee should first attempt to deal with basic policies and procedures on formal training to ease the various difficulties experienced to date in choosing candidates and placing them in training. It should however take on a wider scope as noted herein.

The evaluation team did not see the complete records Sierra Leone - pertaining to the selection processes, including qualifications of individuals and suitability of proposed training. Some of this information undoubtedly exists in written form in country and some of it may be in the contractors' offices. However, the selection process should be formal, the results and all documentation reported to AID and full records should be available at USAID and ACRE. Since at least thirteen long-term trainees remain to be selected under the SULSU contract, the SULSU Chief of Party and/or the ACRE Project Director, should, with the assistance of their staffs, work up long-term training proposals for these trainees. This proposal which should relate to the longer term needs of ACRE should be reviewed and approved by the training committee and seconded by the Management Directorate. There is an informal training proposal by the ACRE Director dated December 1980 in file and this proposal is generally what is being followed. It does relate proposed training to project needs. The ACRE director has just now completed a document which covers many of the concerns raised herein especially about formal long term and short term staff training. As in many other elements of this project we have found the involvement of the project towards a more rational and systematic effort in training.

The contract funds 14 MS or BSC degrees in the US, 6 Masters or equal in Africa and 8 individual short term (six months or less) training activities. It is now evident that at best only some of the seven trainees who are likely to

start long-term training before mid - 1982 are likely to return to Sierra Leone prior to the planned December 31, 1983 completion of the SULSU contract and then only if they are placed in schools during the spring of 1982.

No candidates for Interafrican training have been selected and it is unlikely that either they or the remaining seven candidates for US training will have been selected by the fall 1982 semester, unless a concerted effort is made within the next few months.

Short term participant training has proceeded at a fairly brisk pace and records are available on the reasons candidates took courses, the courses themselves and to a lesser extent what was studied. Courses and candidates are selected on a fairly ad-hoc basis, but the courses have been fairly relevant and most individuals selected have been associated closely with ACRE. The process of selecting short term trainees needs to remain fairly flexible. It is urged, however, that more lower level people be sent on intra African training such as IITA courses.

To expand on the previous point; it is recommended that if funds are available from the short term participant training account, ways be found to extend short-term training opportunities to more staff and related people (ie for example - NUC faculty). This can increase esprit-de-corps and widen project horizons if well handled. For example some short-term seminars could be held at Njala and special group trips to other Ag. Development projects or African research Institutions (IITA, WARDA) could

be arranged. Dr. Gassie, a SLU professor who was on a consultancy for ACRE this last summer urges more emphasis towards in-service training.

The annual training proposal, discussed previously, first needs the full approval of the ACRE management, AID and the contractor. NUC staff participate as necessary. It should include new target dates for major training actions which are tied into any revised project schedule. Training should be reviewed at the management directorate level as to progress, problems and relevance on a quarterly basis. Specific priority training needs should be highlighted.

There also needs to be some upgrading of the correspondence on training and a bit of improvement in the overall coordination of training. On formal training, all PIO/Ps should be cleared by the AID Agricultural Officer the SULSU Chief of Party and the ACRE Project Director. Thus everyone would be aware of the actions being taken in participant training. (Some training has taken place outside of the SULSU contract i.e. Mr. Feika's training in the US for example.)

Perhaps more importantly over the longer run is that the training elements of ACRE be aimed at upgrading the outreach skills of mid and low-level staff and that ACRE and/or another appropriate institution/project work with MAF and MOE in upgrading the pre-service and in-service training of all students, extension agents and higher level people who are or will be associated with adaptive research and extension outreach. The formal training now being conducted or planned, while very necessary

will not bring about the wide dissemination of knowledge among farmers needed to achieve adaptations in agricultural practices. The recent emphases on using consultants to address extension training activities and outreach begins to address this issue.

Perhaps the first steps towards widening training activities would be the recommended emphases on wider and more extensive short term training opportunities for staff and related people (including extension agents) in all fields of endeavor but especially in extension related training and technical training (including especially maintenance staff and financial management).

One could then envision a much wider and more comprehensive training direction beyond this including farm level training and outreach seminars for IADP staff etc. This is worth careful consideration in any follow up activities and should be the subject of continued consultancies under SULSU funding. Individuals undertaking such work should also obtain fresh information on what other efforts are underway to help avoid duplication of effort. (I.e. UK school at Njala, the Mange extension agent school etc.)

The project must not overlook the need for placing long-term trainees in positions conservative to their education and experience. It is unfortunate that long term trainees will have too short an overlap with the SULSU team. The more senior ACRE staff will have to carry out more integration of the returning staff than would normally be necessary if contractor team were to be in place for a longer period. (Please keep in mind that project extensions may carry the contractor team forward thus alleviating this problem somewhat.)

Through early November 1981 there have been about fourteen consultancies financed under the SULSU contract. A couple of consultant visits are planned over the next few months. Although several of the consultants have made good contributions to the project, the record has thus far been spotty. The evaluation team feels that there should be a more planned approach to the use of consultants and that generally consultants should stay longer periods and provide more comprehensive reports than the average to date. Return visits might also be scheduled.

The Chief of Party and the ACRE Project Director are both aware of the problems of getting qualified experts on time who will then stay long enough to make meaningful contributions. This awareness can be translated into positive action if the planning for consultant services is systemitized (and if the results of the consultancies are carefully evaluated and integrated into the project.

We suggest that the present 2-3 consultants now being recruited, be recruited as planned, but that if at all possible there be a careful redefinition of the work scope of each of these consultants and the consultants be informed of what is expected of them before they arrive.

Over the longer run, planning for and use of consultants must be more carefully integrated into the project. This can be most easily done by including consultancy planning in the

annual work plan by having periodic (quarterly) reviews on the status of consultancies, by incorporating the results of the past six months work done by the short term experts in the semi-annual evaluation by assuring that the results of each consultants work is assessed and disseminated if useful.

At the same time the Chief of Party and Project Director can be assessing the effects of the experts services and can be looking to new areas of need. They will be drawing their ideas in part, from GOSL and contractor staff, and it would seem to make sense to record their findings in the minutes of the management directorate committee.

Areas of consultancy which call for immediate attention, and perhaps long range involvement, are agricultural engineering with emphasis on small farm appropriate technology, nutrition (addressed elsewhere), tropical root crops, agricultural research methodology and statistical analysis, administration and management and tropical soils, transportation equipment repair and maintenance. Some of these people, for instance, the transportation equipment repair and maintenance specialist, need to be available from time over a 2-3 year period.

2.4

· Construction ·

Construction aspects of ACRE were coordinated by an engineering consulting firm, Techsult, which basically acted as AID's agent in construction survey, architectural and structural building design, construction supervision and verification that contract specifications were adhered to. The building contracts included provisions for price fluctuations of locally purchased materials. Significant price increases for aluminum, cement and fuel contributed to a major construction cost variance. To date total construction costs paid are \$2,492,934 Le (\$2,118,994) and about Le200,000 remain to be paid for final building construction (which should be completed by December 15, 1981) and for roads. AID budgeted \$735,000 for construction and the GOSL \$1,007,000 for construction, land and civil works. Thus the construction overrun exceeds \$500,000.

## Need for Continuing Educational Center

There is need in the ACRE project in cooperation with Njala University College<sup>for</sup> a multi purpose building which could be employed as a continuation extension<sup>EDUCATION</sup> center. It should have a conference room which could accommodate up to 100 participants. In connection with the center should be a simple dormitory where extension trainees, farmers and others could be housed while attending seminars and training sessions.

Staff in the ACRE program would use the building for in-service training. Farmer groups could be brought in for seminars and the facility could also be used for Njala University College functions.

It is estimated that a modest building with sufficient space for a conference of 100 plus an added dormitory for 50 would cost approximately \$200,000 U.S.

The following is a list by site of all ACRE construction:

- (1) Site I:      10      3-Bedroom houses  
                     10      2-Bedroom houses
  
- (2) Site II:     Administration Building  
                     Soils laboratory  
                     Seed handling building  
                     Warehouse  
                     Generator building  
                     Maintenance center  
                     Seed drying floor
  
- (3) Site III:    16      1-Bedroom house
  
- (4) Roads in Progress
  
- (5) Rokupr site: 1. 3-Bedroom house
  
- (6) Freetown      1      3-Bedroom house

~~INPUTS~~ Support Costs <sup>3.5</sup> RESEARCH AND EXTENSION SUPPORT COSTS

Support Funds and other costs include extension support to pilot areas, mini-kits, on-farm research trials and research

support for the MAF and NUC. The research support costs are for special research activities conducted by students and other nonproject personnel in direct support of project activities. Support costs have been budgeted to gradually decrease AID's portion from 62.7% of total support funds and other costs to 20% in the final year of the project. Total LOP support funds and other costs budgeted from AID sources are \$415,000. Since this amount is greater than realized needs part of <sup>the</sup> money originally intended for support costs ~~may~~ <sup>should</sup> be applied ~~to~~ <sup>to</sup> other input categories.

#### ~~Inputs~~ - GOSL Contribution *AND MAF Support*

It was anticipated that with the local cost support provided by AID that the adaptive crop research and extension project activities would add little to the MAF recurrent development budget during the first few years of the project. The majority of recurrent expenditures were to be primarily for personnel costs. It was estimated that by the end of the project increased demands on the MAF budget would be about \$200,000. Although this initial estimate for recurrent costs is low it is the evaluation team's judgement that given the GOSL interest in ACRE and the priority the project receives in fund disbursement that the GOSL will make the necessary funds available through the life of the project assuming the PL 480 Title I program continues in Sierra Leone.

A summary of GOSL contribution is as follows:

FY	MAF Funds	PL 480
79	38,000 Le	750,000 Le
80	825,000	925,000
81	275,000	<u>800,000</u>
	<u>1,138,000 Le</u>	2,475,000 Le

In October, 1981, an additional 300,000 Le was contribute from MAF sources and 400,000 Le from PL 480 funds. Thus total GOSL contributions at evaluation date are 4,313,000 Le or about 1,300,000 in excess of the amount the GOSL was projected to contribute over the life of the project. ACRE has received about 70% of all PL 480 Title I funds available since December 1978.

Besides personnel costs the GOSL is responsible for utilities, certain commodities, land purchases, civil works, transportation for training participants, insurance, security and some construction costs. The GOSL has been paying all construction costs directly to the contractors and AID reimburses the GOSL account maintained at the Bank of Sierra Leone. To date AID has reimbursed the GOSL for \$720,200 of construction costs.

GOSL and MAF Support and Terms of Service

The MAF has been very supportive of ACRE. Most of the GOSL funds used for ACRE have come from PL 480 Title I proceeds. However, as the financial report shows the government has contributed some 600,000 leones of its own internal funds for ACRE costs. GOSL's ability to support this activity is primarily based on the availability of Title I funds. USAID Freetown should continue to aggressively seek Title I commodities.

MAF support for ACRE has in general been reasonably timely. -ACRE staff appointments have been made a little slower rate than expected but by and large the government had counterparts and other staff in place before the SULSU contractors were in place.

Retention of key ACRE and NUC staff will be a problem.

High salaries elsewhere, especially Nigeria, are a strong draw and turnover is evidently increasing. The total compensation package that the ACRE can offer is not all that attractive. Terms of service continue to be a sore point discussed at each Steering committee meeting. The MAF wishes to avoid special compensation rates for ACRE employees but ACRE itself may be temporary and thus cannot offer certain career security. So far, ACRE is fortunate to have found some dedicated senior staff and some hard working extension staff.

In order to forestall this problem in any future extensions of ACRE it is strongly recommended that the terms of service for ACRE employees be properly gazetted prior to any new AID funding. This is a very difficult task which must go on concurrently with any planning for a new project.

The proposals to unify the directions of MAF activities (including a national unified extension service) of which the British Consultants report is a part are expected

to include extensive personnel and salary policy changes.

AID should keep abreast of these changes and what other donors are doing so that any future AID support are to activities which are fully recognized and strongly supported by the GOSI and offer attractive career opportunities to project staff.

## Commodities

A REDSO commodity advisor will review the overall commodity situation and write a report which should be annexed to this evaluation. The evaluation team has noted that the original PP called for \$741,000 of AID financed commodities and some \$145,000 of GOSL financed commodities.

Financial records show that AID has already committed \$1,142,000 for commodities.

The Project Paper was deficient in its treatment of commodities. For instance AID bought 14 Broncos instead of 5 Land Rovers as expected in the PP. This represented a serious underestimation of need. Many of these Broncos will have to be replaced before the project is completed. They are used fairly heavily. The PP estimated replacement of the 5 land rovers in year 3; if the Broncos are replaced in year 4 or 5 that will mean another \$175,000

The PP estimates for equipment and commodities for the soils lab were purely guess work. One result is three years into the project there is still questions over the types of equipment best suited for the lab. PIO/Cs were recently issued so this issue is moot--but the equipment and supplies ordered will cost way over twice the cost estimates in the PP.

Most necessary spare and repair parts for vehicles and the necessary tools and workshop equipment have not yet been ordered. This is addressed in the vehicle maintenance section.

Physical control of inventory is lax and there is no verification between financial and physical records. The physical control problem is due to the fact that not all facilities are completed. It is recommended that interim and final physical control procedures be established.

There is also a very ad-hoc stock reordering situation. ACRE management should assure both adequate physical commodity control and set in motion a system which will assure timely arrival of expendables and other commodities. Lack of fertilizer during a planting season would be very detrimental to research.

ACRE also needs to assure that adequate commodities are on site at all five zones. This should be the subject of a special inspection and periodic follow-up. One zone has insufficient fertilizer to run certain trials this year.

The AID Agricultural Development Officer should before and during the upcoming visit of the REDSO commodity advisor familiarize himself with the entire range of project commodities on hand, ordered and to be ordered. He should record any commodity transactions that were counter to AID regulations (of which there may be one or two minor violations not of a serious nature) and he should assure that future PIO/Cs are executed by the interested parties prior to initiation of procurement.

The ADO and ACRE and SLUSU management should develop a mid-project commodity procurement plan based on a needs and

usage rates. Due to project financial constraints this plan needs to be lean and tight. It should be adjusted periodically to account for actual needs. If this is not done the costs of project commodities is likely to get out of hand. If no one questions the commodity requests persons, with no malice of intent, will request perhaps more special equipment or commodities than is absolutely necessary. A good commodity procurement plan is a necessary tool for all projects and is becoming a critical element in this project

### 3.8 SUPPORT FOR SENIOR EXTENSION OFFICERS

All five SEO's have now been provided living accommodation but they have not all been furnished, as called for in the agreement for employment. Office space has been provided to four of the five SEO's. In the case of the fifth SEO, ACRE has agreed to renovate an old office in Makeni, but this has not been done. Office supplies have been supplied but no support staff has been employed to assist in the SEO's work.

#### Recommendation

1. Deliver the furnishings for SEO housing.
2. Find suitable office facilities in Makeni for the SEO.
3. Provide office furnishings, supplies and support staff for each zonal SEO.

After first attempting to satisfy transport needs of the zonal extension instructors with bicycles, project management recognized that this was imposing a tremendous time constraint on the delivery of extension services. Thirty Honda 125S motorcycles were purchased in-country and distributed to the extension instructors. Insurance coverage was provided for each of these motorcycles while operations within the zone to which they are assigned. Requirements for parts due to minor accident and routine wear and tear has caused some difficulty in keeping all

the motorcycles in operation. The parts are obtained from one location.

Recommendation

1. Determine which spare parts are most often needed.
2. Establish a parts supply in each of the zones which will include those parts and will be managed by the SEO.

### 3.9 Analytical Research and Soil Testing Laboratory

An important component of the adaptive crop and research program is the development of an analytical soil and plant analysis laboratory. The laboratory building is near completion and the equipment and chemicals have been ordered. The laboratory anticipates that it will analysis over 20,000 soil and plant samples from the research plots as well as farmers fields. It is unlikely that the laboratory will be functional before March 1982.

It is expected that a Sierra Leonean now studying in France will be employed to take charge of the laboratory. Dr. Beecher of the contract team will serve as technical advisor to the operation

The evaluation team feels that the planning and development of staff for the laboratory has been well done. We are deeply concerned with the ability of the project to provide the support services necessary to develop a full-fledge analytical research laboratory.

Without electricity on a 24 hour basis the ability of the laboratory to function satisfactory will be greatly impaired. Management must take a good hard look at the costs of supplying energy to such a laboratory and determine if the project can really afford this research facility at this time.

There is no doubt that this laboratory could do much to supply research data important to the future development of agriculture to Sierra Leone. In fact the lack of analytical data or soil and plant tissue samples is seriously hampering

## Project Need for Information Specialist

Public information support is a basic need of technology transfer and the lack of this function, particularly now as research results are being realized will be a hindrance to the potential of a rapid spread of recommendations to farmers and the adaption by farmers of improved practices. ACRE Project should have a person primarily responsible for publicity support of research and extension efforts. Although research results can be disseminated to farmers by direct contact, such effort can be enhanced and the effects accelerated with supportive publicity, leaflets, pamphlets, radio, etc.

Additionally a communication person can do much to promote the image of ACRE and its workers. It is unfair and unrealistic to give public information duties to an administrative officer. The nature of his work will allow little time for creative development. The person for the position ideally would be a trained professional with experience in public relations. At this early stage in the ACRE project, a person, possibly a recent graduate with a strong English or literature composition major might prove most satisfactory, if he or she possesses an imaginative "public consciousness." Later another person should be hired to be trained as a visual aids specialist.

## Consideration of an ACRE Rice Production Contest

In order to add impetus to the on-going crop production activities now being carried out in the ACRE project, consideration might be given to developing and implementing a contest in rice production.

Rice is the main food crop of Sierra Leone. It is grown in both uplands and swamps. With improved cultural practices, judicious fertilizer use and improved varieties rice yields could be significantly increased.

The contest should be focused on an educational program to demonstrate (1) how high yields of rice can be produced and (2) the extra yield that can be obtained from use of new technology. It is suggested that during the first year of the contest the farmer or contestant have two areas side-by-side--one in which he produces rice with normal practices, the other, an area where he uses new technology such as line planting, fertilizer, insect control, weed control new variety, etc.

The contest would thus have entries in both swamp land and upland rice production. Each zone would have separate contestants. Recognition would be given to farmers obtaining (1) the highest yield per acre and (2) the biggest difference between their normal plot and the improved practice plot.

A simple contest entry form would be developed with a standard set of rules on size of each plot. It would include the farmer's name, village, etc. It would also indicate the various practices used by the farmer.

The agriculture instructors in each area would be in charge of supervising the contest and determining yields at harvest time.

Recognition would be given to farmers in the form of certificates and/or plaques. Money or material prizes should not be given. A recognition luncheon or banquet might be given to pay special attention to the contestants. Private businesses might be solicited to help defray the expenses of the contest--including the luncheon or dinner for the contestants.

Considerable publicity could be gained for the ACRE project if the contest is organized and implemented correctly. Newspaper articles, radio briefs, etc. could help publize the contest. At the same time the project could gain important information on the adaptiveness of its recommendations for rice production.

## OUTPUTS

### Trials Conducted

The wet season of 1981 is the first cropping season for which this ACRE Project was fully operational - 280 trials and 360 demonstrations were planned. The project was successful in establishing 219 trials and 308 demonstrations. The difference between planned and executed work was the result of a decline in participating farmers - (from 300-291). According to E.J. Mammy Extension Coordinator the (1) lack of resources, (2) poor health of farmer (3) lack of interest in agriculture (4) poor land preparation (5) misleading information supplied by socio-economic baseline survey enumerators resulted in a decrease in farmer co-operators. The distribution of research trials and extension demonstrations were as follows:

Zone	No. of Tials Executed	No of Demonstration Executed	No. of Farmers
Njala	37	63	58
Rokupr	54	58	61
Makeni	53	55	61
Kabala	36	64	53
Kenema	39	68	58
Total	219	308	291

NOTE: Trials and demonstrations for second cropping including cowpea are yet to be conducted.

## Quality of work

The quality of the demonstrations and trials was found to be quite mixed, according to the Evaluation Team, ACRE staff, and farmers. One major factor negatively affecting their quality was the late delivery of planting materials due largely to poor administrative planning and to the physical difficulties encountered in the transfer of living materials from one geographic zone to four other zones, none of which is close or easily accessible. However, some demonstrations, notably varietal, fertilizer, and cultivation practice often appeared successfully varied out. Contact farmers, and the many interested village neighbors who reportedly had seen the plots, praised many of the demonstrations and trials. Notable failures were trials on improved weeding techniques and timing and these involving herbicide without fertilizer. Lack of control of weeds was related to difficulty in carrying out weeding according to schedule, and, in the case of timing, the lack of flexibility for weeding when growth was at crucial growth stages. Another set of trials and demonstration which ~~most be carefully considered are those involving double cropping~~ If ACRE promotes the planting of a second crop which is not ~~groundnut in areas where the traditional dry season, second~~ crop on rice fields is groundnut and the traditional manager and recipient of benefits of groundnut harvests are women, the ACRE project could work to the decrement of the woman in the family labor force. One problem with trial and demonstration

design was the lack of opportunity for personnel involved in extension to provide their experiences in deciding on the nature and timing of demonstrations and trials. The ACRE project was designed as one in which communication was to flow between all participants in the research - extension system. This year all decisions were made by the research staff as to which varieties techniques, fertilizers and herbicides would be tested in the trials and demonstrations. This method of operation was the result of getting operations initiated in the first cropping season. It should not be continued. There should be an input from all the technical staff. The USAID contract staff who have had a great deal of experience in adaptive research trials should assist the ACRE project in planning its trials. Based on this years experience the staff of ACRE might find it wise to reduce the number of demonstration and develop more fully those which offer a total package program - i.e. seed bed preparation, planting, weeding, fertilizer, etc.

#### Recommendations

1. ACRE should carefully review the results of its demonstrations and trials, and vigorously examine causative factors in success and failure. Those judged as technically flawed should be discarded. Those judged as affected by events or factors are related to experimental variables could be done again under same or different conditions

or be extended to farmers. Throughout the process of reviewing results extension personnel and contact farmers should be full participants in judging trial and demonstration validity, utility, and replicability. Selection of next year's trials and demonstrations should also involve extension personnel contractor-technician and farmers.

- 2 The crops chosen for demonstrations and trials should include those whose development benefits all segments of the farm family population. Specifically, the replacement of crops which offer economic advantages to women by those less advantageous to them should not be promoted.
3. Farmers, extension, and research personnel have planned regular interaction including:
  - 1) Visit by farmers and extension personnel to Njala to physically observe research efforts to provide direct input to research and to demonstrate the emphasis placed on feedback from them in developing further research;
  - 2) visits by research personnel to farm sites to observe demonstrations and trials and to learn from extension personnel and farmers about their experiences based on those hypotheses, experiments, and conclusions in agricultural research;
  - 3) training of farmers based on a mutual interchange

and extension personnel with researchers which research personnel to introduce their work and learning and allows flexibility for farmers and extension personnel to teach researchers through recall of their experience and their knowledge.

### 4.3 Farmer Compensation

Compensation for the use of farmer's fields was delivered only after work had begun on tests and demonstrations. In some zones, this delay allowed some farmers to develop doubts as to the necessity and wisdom of participation in ACRE field work. In the area near Moyamba, for example, a farmer expressed disappointment because he had been led to believe, by socio-economic survey enumerators, that he should clear and prepare much more land than the trials and demonstrations actually occupied once installed. The farmer, thus, was expecting much more compensation than he received. However, despite some delays and misunderstandings, farmers expressed satisfaction with their compensation, an average of Le20.00 per farm.

Recommendation - Provide clear explanations of the amount of land needed for future trials and demonstration, and provide timely delivery of all compensation funds

## Research and Extension Staff

Thirty Research/Extension Technicians and Five Agricultural Officers trained and Operational in all five zones.

The project paper for the ACRE Project called for the training and fielding of five agricultural officers and thirty research/extension technicians. The project has five senior officers and thirty officers called extension instructors. The change in title, however, is not a matter of only semantics. Rather the full purpose and intent of these positions as envisioned by project is not being implemented. The Agricultural Officer were to have as primary responsibilities "the supervision of research and extension operations in their respective areas". They were to receive training "during the initial stages of project development ... in management, on-farm research trials, on-farm extension trials, marketing/credit, and data collection/analysis." They were to be able to "absorb full responsibility for all adaptive crop research and extension activities at the field level".

The position now called Senior Extension Officer involves managing logistics for movement of Extension Instructors, receiving instructions from research personnel as to the kinds of trials and demonstrations they are required to execute and the schedule they are instructed to follow, and reporting to the Extension Coordinator on progress and problems without directly contacting research personnel. No regular opportunities exist for training of SEO's, no regular opportunities exist for interaction with either research personnel or top project management, and no

flexibility is designed in research schedules to allow for <sup>and experience</sup> contribution of SEO knowledge, for example, activities in the cropping cycle are scheduled at Njala with no consideration of variation in zone reading, and ability to carry out. None of the areas of training from the PP have been provided to SEO. At least one SEO has never had a meeting with the Project Director to discuss his work. The effectiveness, even the utility of these officers is severely impaired by these shortcomings.

The thirty extension officers were to "report directly to the agricultural officer in charge of their areas." They were to "be responsible for developing and keeping open an effective two-way channel of communication between the participating smallholders and the center's research and extension staff." To carry out this broad mandate they were to "receive training in on-farm adaptive research trials, on-farm extension trials, marketing/credit and data collection".

To date, the extension instructors, as reported by the SEO's and all contact and interested farmer families interviewed, are performing extremely well. They have actively involved themselves in farm work and are able, in almost all cases, to effectively elicit participation from farm families.

Information is energetically, if not always comprehensively, passed on and the results, knowledge, and experiences of farmers in relation to the demonstrations and trials are reported to their SEO's.

But they are not completely fulfilling the role envisioned in the PP due to gaps in implementation of the design by project management. Their role is truncated and its effectiveness is impaired. First, training is sorely needed, a fact repeatedly pointed out by EI's with the evaluation team when talking. They received a three-day orientation before the beginning of the crop season and have received one day per month of further training conducted by their respective SEO's. Much more training is needed in agronomy, extension techniques, research methodology and data collection and analysis. The last area of training introduces the second major gap in implementation, the lack of use of EI's in relation to research and project monitoring. Due to the one-way flow of direction of research mentioned earlier, EI's are not given the opportunity to provide information and analysis from their experiences and those of the contact and interested farm families to research staff. Further, additional agents have been employed, the enumerators for the various surveys, who, while gathering some very important information, have caused severe problems for the project. EI's have effectively established rapport and gained the confidence of large parts of the farm communities. Enumerators have had to cajole and, occasionally, misrepresent themselves, the benefits of the project, on both to gain even less rapport than that of the EI's. Further, EI's are subtly made to wonder if project management questions their ability to carry out research.

The key information needed in this project is that derived from slow, incremental, but extremely important modification in farm management thus could be provided much more effectively and accurately by EI's if they were given training to be able to carry out repetitive data gathering. It would strengthen the data and the usefulness of these key project personnel. The survey data, while useful is not crucial information for the project. The project needs to know fully and accurately about constraints and possibilities in farming systems and how they change during the life of the project. EI's once trained and provided appropriate instruments, could collect this information on a weekly basis. The one time recall of an overwhelmingly complex set of factors which was and is the focus of the most important information for this project.

Finally, by combining field research and extension as the duties of the SEO and EI, the project will return to fulfilling a key purpose of the original project, the institutionalization of a combined system of agricultural research and extension. The system would structure the means for meaningful and continuous information flow from farm-families through research/extension officers to research specialists and back again. Not just the behavior and thinking of farmers must be changed, but also extension and research personnel must modify their concepts and ways of thinking about the agricultural research and technology transfer process.

## Recommendations

1. Redefine the role of Senior Extension Officer, providing regular opportunities for training in agronomy, extension, research methodology and data gathering and analysis. Further, give SEO's the opportunity to fully participate in selection, planning, and scheduling of the entire program of training, demonstration and trial execution, evaluation and monitoring.
2. Redefine the role of Extension Instructor, providing regular opportunities for training in agronomy, research methodology, and data gathering and analysis.
3. Allow SEO's and EI's to have regular opportunities for actual face-to-face review of trial and demonstration results with research staff. Priority should be given to these opportunities for training and research critique even if it means SEO's and EI's must leave their field posts for brief periods because the long-run benefits will outweigh the short run difficulties. It is more important to have well-trained SEO's and EI's fully participating in an on-going research-extension linkage than to have all field staff continuously on duty not performing these duties in the most effective manner possible. Training should be done at NUC because of the ability to provide the best facilities, and instruction for training, while also rewarding the

SEO's and EI's for their hard work by providing a brief period of comfortable accommodations and rest and relaxation. Training in data gathering and a analysis should be the responsibility of the ACRE U.S. trained rural sociologist, Sierra Leonean experts in rural and experimentation such as John Karima of Fourah Bay College or Harry Turay of NUC, or an expert provided by SULSU. The two former sources are preferable to the third.

Research critiques, the face-to-face interchange between the EI's who now truly will be research/extension technicians) and research staff should take place at research sites on the grounds of NUC and at field locations in the fire zones. Thus, research staff, particularly Sierra Leonean, should plan a regular schedule of field visits and should be ready to accept the observations and conclusions of SEO's and EI's as colleagues in research/extension.

Both SEO's and EI's should be provided training and the necessary instruments to carry out data gathering for project monitoring. Essentially, this would be done by collection of weekly farm management information. This kind of information is the most crucial in a project which intends to collect information on present agronomic practices and social and economic constraints, modify these through their adaptation and through the introduction of innovations, and test these modifications through research station and on-farm trials and demonstrations.

#### 4.5 Selection of Contact Farm Families and Expansion of Activities to Interested Farm Families

The role of contact farm families, has been modified since the design of the project was completed. Originally, 300 farm families were to be selected, some of whom were to be the face of research and some of whom were to be involved in extending new varieties, techniques, and inputs to groups of interested farm families

Selection of contact farmers was actually structured and constrained by the project design and earlier selection of a sample for the baseline socio-economic survey. The first delimiting of the universe of possible farm families came from the Project Paper and was the decision to include only five zones for ACRE activities. These were areas roughly within twenty-five mile radius of Njala, Kenema, Rokupr, Makeni, and Kabala. The PP and survey criteria then stratified this sample by agro-ecological zones, chiefdoms, and villages. Representation was relatively equal between agro-ecological zones. Chiefdoms were selected at random within these zones and villages were chosen at random within the chiefdoms. Population censuses were hurriedly taken in these zones and a random selection of farm household heads was made. However, the vigor of sample selection was reportedly weakened as enumerators replaced people whom they could not contact with others chosen arbitrarily or for personal reasons. A sample of 1500 individuals, most of whom were farmers was selected and interviewed.

Later, the selection of a group of 360 farm families as contact farmers was made. Conflict reportedly occurred in some zones because researchers wanted selection from the villages and households which they had selected for their survey, while extension personnel wanted to follow their own criteria.

Village selection by extensionists favored villages to which access was relatively easy and assured throughout the year because of the need to deliver materials and repeatedly visit farmers and favoring larger rather than smaller populations. Individual farmer selection, for extensionists, favored households whose full-time occupation was farming and who had some degree of stature and recognition as influential in community life. Eventually, 360 farm families were selected through the working out of this conflict. Data on all cases was not available to the Evaluation Team, but indications found within a 10% random sample of contact farm families and in interviews with extension staff revealed that extension criteria were more generally applied than research criteria.

Between selection of the 360 and the beginning of activities for the wet season cropping in 1981, the number of contact farmers declined to 299. Reasons for each case of dropping out were not available, but they were reported to include: 1) some farmers did not have access to adequate land; 2) some farmers were disappointed to learn about what the ACRE program intailed compared to extravagant and untrue promises made by some of the survey enumerators; 3) some farmers left are from survey selection, did

not fully or even partially dedicate their activities to farming; 4) some farmers felt their state of health on their advanced age would not permit them to participate; and 5) some farmers felt that they did not have adequate financial resources to participate. By the end of October, 1981, 289 farm families were participating in the first year's trials and demonstration reduction from 299 occurred due to reasons just cited.

The principal change from the Project Paper is that all of these households serve in the same capacity. There is no differentiation between research farms and extension farms. Demonstrations and trials are present together on many of the farms, and all farm families play the same role of adaptive testing, working with the EI's. This lack of implementation of a project design feature apparently was caused by a decision to maximize farms available for tests and demonstration. There seems no reason to find fault with the decision especially as the project was behind its implementation schedule in its first cropping season.

The principal difficulty in relation to farmer selection stems from the partially arbitrary procedures followed to date. The project combines carrying out research and promoting extension. Selection of farmers for research, using vigorous sampling techniques, and for extension, using criteria based on the need to rapidly and effectively disseminate information and promote innovation, are inherently difficult to combine.

There is a great likelihood and apparent need to expand activities of ACRE by working with and providing services for

additional farm families. The Evaluation Team found, at project meetings and at informal village gatherings that the number of contact farmers could, at a minimum double in the next cropping season. Selection should be based primarily on criteria developed to promote the extension of techniques and materials to farm families most likely to benefit from them and spontaneously spread them further in the population. Collection of data from the original and expanded groups of farmers will, thus, lose vigor, but the tradeoff of heightened degrees of innovation testing and introduction makes biased selection imperative. There is a need, though, to think about and test alternative means for spreading the information and materials of the project.

#### Recommendations

1. The project should review the results of working with its originally selected contact farm families and discontinue working with those, whether originally chosen for research or extension criteria, who have not fully participated in the work of the project.
2. Replacement of those eliminated and addition of new contact farm households should consider the following factors: 1) level of dedication, interest, and capability in farming; 2) respect among fellow village residents; 3) adequacy and nature of household labor force (favoring complete family units and disfavoring those who have to or are able to have most labor); 4) availability of land representative of the

project's major agro-ecological zones; and willingness and ability to spend time assisting others in the village who may be interested in testing ACRE's varieties and techniques. (See Appendix H, for suggestion for a selection instrument)

3. Alternative means for the transfer of varieties, techniques, and inputs available from the project to interested farm families should be developed and tested. These should include: 1) Increasing the workload of assigned cases to the EI; 2) Increase the number of EI's available to cover the same number of farmers as in the first cropping season; 3) Recruit and train contact farmers judged to be successful in using the new technologies and capable of working with other farmers by themselves (they should work both in groups and as individuals to test both means); 4) Hold village or inter-village meetings using various means of education and follow those with the distribution with a minimal change of mini-kits which each include enough materials and instructions for farmers to test new technology on their own while repeatedly monitoring the use of the technology. Any or all of these means should be tried either on an experimental basis (in which case, comparability of results should be aided by selecting farm families and areas in which to try them according to as vigorous criteria as possible) on as combined

methods. Controlling the application of methods and following experimental procedures would offer the maximum opportunity for learning from the project for future activities. Combining the application of methods would provide increased likelihood of technology transfer in a manner more rapid than the experimental design. For example, villages could be selected based on similar ecological settings, crops, access to roads, population, ethnic group, and age structure. In one village, ACRE could double the number of EI's and contact farmers. In the other, ACRE could recruit effective contact farmers, ask them to work with neighbors, and establish some means of remuneration. After a year, the spread of technology could be compared and conclusion about the effectiveness and costs of alternative methods of dissemination. ACRE could also double the number of EI's and contact farmers, recruit contact farmers to do extension, hold meetings, and distribute mini-kits in the same village.

If an experimental application of alternative methods is used, the project could employ its U.S. trained rural sociologist, it could recruit Sierra Leonean experts in rural survey and experimentation such as John Maximu of Fourah Bay College, Harry Turay of NUC, or it could get short-term expertise through the SULC contract to manage the effort. The two former means would be preferable.

## Purpose

The stated purpose of the project is "to develop a crop adaptive research and replicable technology delivery system responsive to the needs of the rural small holder."

The achievements toward reaching the project purpose at the time of this evaluation were considerable.

1. Adaptive research on major food crops is being carried out by ACRE research staff in cooperation with staff from the Njala University.

A reconnaissance of research trials in the field was made by the evaluation team. The trials were well designed, appropriate for the needs of the rural small holder and well cared for. Trials included soil management, rotation and introduction of new varieties, of cassava, sweet potato, upland rice, maize, cowpeas, pigeon peas and yams

2. Adaptive research and extension activities in crop production have been extended to 299 families in the 5 areas of operation (1) Njala, (2) Makeni, (3) Kabala, (4) Rokupr, (5) Kenema.

3. A system of technology transfer has been organized with scheduled activities and reporting system. The ACRE program at present has 38 agricultural officers and instructors involved in placing demonstrations making farm visits and holding group meetings.

4. Trials recently completed in the five areas of operation indicate that the yields of crops can be significantly increased

by substitution of improved practices for traditional practices. A combination of improved varieties, fertilizer usage and weed control has resulted in from 70 to 100% increase in production on most crops.

It is too early in the project implementation to determine the degree of impact which the transfer of technology will have on the small holder families.

Farm-level data collection and analysis has been initiated. Data collection is focused mainly on labor and cash inputs and yields of crops. The analysis of data has not to date identified the cost effectiveness of the various practices currently used in the adaptive research and extension trials.

The evaluation team found that there were cooperative research efforts between the ACRE project and the University of Njala staff. This cooperation should be continued and expanded to assure the linkage of university staff with ACRE personnel.

The goal of the project as stated in the project paper is to "increase small holder productivity and nutritional status".

Adaptive crop research trials and demonstration in this project as well as other projects reports by F.A.O. and M.A.F. have shown that, with improved practices, large increases in yields of rice, cassava, sweet potatoes and maize are possible. The evaluation team had the opportunity to view first hand several trials which indicated excellent crop production potential. The willingness of farmers to accept new technology and cooperate was consistently observed.

The major concern regarding increased production lies with factors outside the project, namely, the constraints of labor, and credit to purchase fertilizer. Many farmers are anxious to receive fertilizer for they know it greatly increases the yields of their crops. At present however, there is little available credit to purchase the material.

The constraints of labor can only be relieved by an introduction of intermediate technology - improved hand tools, hand planters and improved harvesting techniques.

Further labor constraints can be eliminated with the introduction of animal power. There are many social cultural and economic constraints which must be overcome before animal

power can become an important part of agriculture in Sierra Leone. *but ways must be sought to overcome these.* Positive experiences with animal tractor have been obtained at Njala University College. *The water buffalo might prove satisfactory for farm power as well as a means of transportation.* These experiences must be transferred as soon as possible to villages.

## 7. Beneficiaries--Key Socio-Cultural and Socio-Economic Factors

### Innovativeness

These two intangible yet crucial factors affect all decision-making in the process of agricultural research and extension promoting productivity improvement and technology transfer. The first factor, innovativeness, is said to have two principal facets. First, small farm families are thought of, by some people inside and outside of agricultural development, to be resistant to innovation due to dedication to an obsession with tradition. This idea can easily be refuted by recalling the major innovations adopted by Sierra Leonean farmers including the spread of cash tree crops (coffee, oil palm, cacao) and inland valley swamp and mangrove swamp rice cultivation. Sierra Leonean farmers have shown a marked ability to innovate.

The other facet of innovativeness which is thought to limit its expression in Sierra Leonean farmer behavior is the existence of institutionalized levelling mechanisms. These are the secret societies which channel envy through social groups and witchcraft which involves manipulating supernatural powers. Both of these aim to control the individual's ability to innovate and consequently "get ahead," in some way, of other members of the community. Neither of these was seen to be serious as limits to innovation within the population

involved in the ACRE project. One expert on rural Sierra Leone social life commented that, in reality, the secret societies reward anyone who can get ahead by validating their economic status with a supernatural sanction. Witchcraft was not evident as a factor. All contact farmers interviewed reported that their neighbors had visited their plots and demonstrations, and not one incident of jealousy, channeled into witchcraft was mentioned. This is not to say that it could not happen, but it would appear to be an insignificant check on innovativeness.

## 7.2 Rationality

The Sierra Leonean farm family decision-makers were observed to be very rational when it came to determining the best use of their resources. They do not limit production to some fixed consumption goal (the infamous "backward bending supply curve"), but rather maintain risk aversion as equal to or more important than profit maximization. The ACRE Project has effectively taken this into consideration through the compensation payment for the use of land and labor for placing and maintenance of trial and demonstration plots on farms. However, future research and extension must constantly bear in mind the risks and constraints which impinge on farm family production. It is risky to increase labor requirements during peak seasons due to limitations on availability of manual labor within

families, through exchange mechanisms, or on some basis of hire or wage employment. It also can be risky to adopt the use of fertilizers, herbicides, or pesticides due to price and availability problems. The farmers of the Kabala zone were apparently resistant to fertilizer tests, stating that their traditional use of rice stalks for mulching was adequate fertilizer and that they did not want to become dependent on something which added costs and uncertainty to a system already difficult to manage. One more aspect of nationality is the seemingly irrational ability of farmers to group together to strengthen their position in marketing their products. There are four factors related to this problem. First, farmers lack credit institutions which offer rates of interest which permit the retention of some grain from harvests. They are forced to borrow money at critical peak labor periods or rice at critical food shortage periods at ruinous rates of interest from traditional village money lenders. They are often obligated to sell their rice below its value at harvest to cover payments. Second, if farmers are able to manage to harvest their rice without any or too many liens on it, they have minimal or no capacity for storage and must sell at generally the same time as everyone else in the area. Prices are at their annual low due to this glut of supply.

One solution for both these major and real risks for the Sierra Leonean farm family is some form of cooperative association. Credit, storage, and marketing can be done by such institutions. Unfortunately, the history of cooperatives is the same in Sierra Leone as in the rest of the developing world. Lack of managerial skill, accountability, and just plain thievery have been the principal causes for their failure. One common feature, though, has been the imposition of organizational structure from outside the local community. There is some chance that an organization formed by a community, if provided with managerial and financial training and not overloaded with outside capital, could function in rural Sierra Leone. However, an immediate solution would be to provide individual or group storage technology.

There exists no dearth of innovative and rational farm family decision-makers in Sierra Leone, in general, and among ACRE project contact farmers, in particular. What must be done is to provide the conditions and technologies which make innovative for improved production and productivity the most rational choice of action available to the farm family.

### 7.3 Direct Beneficiaries

The immediate beneficiaries of the project are the Research and Extension staff and those involved in project activities as well as those who adopt the new technology.

It is the judgement of the evaluation team that there could have been many more contract "households" involved in the project if the constraint at selection farmers at random had been removed.

Research and technology transfer should seldom be done at random. Research sites in particular should be chosen carefully to represent specific soil taxonomy conditions. The site should be uniform and not subject to forces which might bias the information obtained.

Similar extension demonstration sites should be as readily accessible as possible. The demonstration should be carried out with a farmer who is likely to give as full a cooperation as possible. The cooperators should also be one who has the respect of his fellow agriculturists.

### 7.4 Indirect Beneficiaries

Indirect beneficiaries of the project are already numerous, and can be expected to increase. The extension project staff has stimulated considerable interest in its work in the zones. Many farmers are asking to become part of the project.

## 7.5 Replicability of Project

Based on the teams observations in the field there appears to be no question that the project is replicable either in Sierra Leone or in other developing countries. There is no question that the lack of credit as well as marketing facilities are great constraints to the full development of the project. Farmers have demonstrated a willingness of change and are thankful for the opportunity to work with someone who cares.

## 8. Unplanned Events

### 8.1

#### Economic and Policy Environment

Recent missions by IBRD and FAO experts have pointed out the various agricultural sector and constraints which exist in disincentives Sierra Leone's fairly open economic system. The government is aware of the situation and there are various proposals to alleviate some of these disincentives and constraints.

At least three-quarters of the country's economically active population is engaged in agriculture. Agriculture (including fisheries and forestry activities) contributes about 36% of the country's GDP. The per-capita real annual income of those engaged in agriculture is in the \$100 to \$120 range or approximately half of the country's estimated per capita income of \$250.

Within the agricultural sector there is a relatively equal distribution of resource access and income although there are certain fairly pronounced regional variations of i.e. the Eastern regions soils and climates which are conducive to tree-cash-crops provide a much higher income level for these farmers than most northern area farmers achieve. The northern area farmers are primarily engaged in shifting upland subsistence food grain cultivation a much less remunerative form of agriculture but other options are limited, for the moment, at least.

Total Agricultural production in Sierra Leone has trended upwards at an average rate of about 1.5% or 1.6% per annum over the last decade. This is slightly in excess of the growth rate of the economically active agricultural population and indicates some productivity gains. However, total production growth is less than overall population growth. While this has not yet reached caused severe problems, the recent poor performance of the modern sectors of the economy, particularly mining, have served notice that the country's economic future is closely intertwined with agriculture.

Government fiscal policies are not dissimilar to those of many other small developing agricultural based countries. Some three quarters of government revenue is caused from indirect taxes (duties, excise taxes, export taxes burden does, however, fall rather heavily on the agricultural sector carrying a very disproportionate share of the country's tax burden. The effective average tax rate<sup>paid by farmers</sup> on tree crop produce has averaged 35%, while diamond producers carry an effective tax burden of much less than 10% of income. (Diamonds are the country's major export earner, the diamond areas are playing out however and quantities are diminishing, individual prospectors are indirectly taxed through the buying prices but still come out much better than farmers. DIMINCO (51% GOSL owned) and the 30 or so large buyers/exporters are taxed at extremely low rates)

CONCLUSIONS:

In general, the construction of the buildings was found to be satisfactory and structurally sound. Most of the problems found were of a finishing nature and correctible. They will, however, need to be followed up to make sure adequate corrective measures are taken. Some of the evident problems, specifically the painting, were a result of poor design or specification judgment.

It is strongly urged that a copy of the bill of materials and specifications, and construction drawings, be furnished to the Estate Engineer so that he can know what to look for during completion of the remaining work on the buildings and insist on corrective measures on work or items not in accordance with specifications.

These fiscal policies run counter to the government's stated goals of improving income and productivity of small farmers and in fact because the tax generated revenues from the ag. sector evidently exceed all government investments in the rural areas by about a factor of 200%.

Despite this the net return to labor in the tree crop sub-sector is higher than the net return to labor in the food crop subsector. It is interesting to note that for the last several years the official government buying price for rice has been equal to or above the cost of imported rice. This is in contrast to neighboring countries and shows a positive policy step by the GOSL. Nevertheless the actual price received for rice by farmers is cut considerably by buying agents fees, carrying costs, transport, etc.

There is sentiment within the MAF and elsewhere <sup>planning</sup> to lift producer prices on cash crops and to take other actions which will improve farmer productivity and access to markets. One should keep in mind, however, that it will not be easy for the GOSL to restructure its revenue profile. An educated guess is that the GOSL is serious about increasing rural sector investments - especially those which foster agricultural sector production and productivity. (Hence the recent emphases on the 7 large Integrated Agricultural Development Projects and rural roads and the large increases in MAF budget allotments in comparison to other ministries) while investments will increase the change in the tax profile will come about only slowly and

and reluctantly.

On balance one can argue that there are positive trends in the agricultural sector. The recent economic difficulties of Sierra Leone caused in large part by the increased oil prices, the drop in the mining sector poor fiscal management and erratic swings in world commodities prices have on one hand partially mashed these trends and on the other hand made it obvious to at least the technical levels in ministries that the country will become more than ever dependent upon its agricultural sector as the real engine of growth.

It would appear, as well, that there is a certain recognition of this at higher levels - but the lack of flexibility in the economy remains an inhibiting factor to releasing the economic potential of agriculture.

Other positive points are worth mentioning. One is the recent effort within MAF to identify all the constraints farmers face in marketing produce (price), transportation, regulations, storage etc.) and come up with action programs to reduce such constraints. This is a country wide effort which transcends the IADP projects. Another is the MAF's recent plans to look beyond the IADPs toward truly integrated nationwide agricultural planning and services such as a national extension service. ACRE or its predecessor could play a key role in this effort.

There are obvious management and administrative problems within the MAF which will leaven their success and slow progress - but these are problems which can be surmounted

over time. In balance the evaluation team feels the environment in which ACRE operates is supportive and conducive to long range success of the activity. Elsewhere in this report are more detailed direct project related comments regarding coordination between ministries, ACRE's relationship with IADP, etc.

Despite the high marginal tax rates placed on cash crops there remains from available printed evidence<sup>a</sup> monetary incentives on the part of farmers to engaged in tree cash crop agriculture. It is important for the ACRE agricultural economist to study the available evidence on the relative net returns to labor on various cropping systems (taking into account such factors as risk-aversion-family food needs etc.) under present and improved practices, perhaps outside of the general ACRE program so that decisions can be made on the direction ACRE research and extension activities could take in the future.

ACRE, SULSU, MAF, NUC and AID officers involved in this project need to learn about the longer range plans of the GOSL toward rationalizing the MAF's activities. One potential trend which is likely to take hold is a trend towards a national extension service; an integration of the several extension services in the IADP's and other extension services. The forward planning of this project should keep this in mind as it looks towards integration of ACRE and/or its eventual institutionalization:

Special Problems (Foreign Exchange and Cash Flow)

The foreign currency limitations of the GOSL ~~make it difficult to~~ persons ~~leaving~~ <sup>in</sup> Sierra Leone ~~from carrying~~ <sup>to acquire</sup> U.S. dollars. This has been a problem for participants going to the U.S. for short-term training and for other project personnel traveling on project business in the U.S. The ACRE and MAF personnel receive per diem rates ranging from Le 50 to Le 150 depending on their position level. These travelers leave Sierra Leone with US\$50 pocket money and contact SULSU immediately upon arrival in the U.S. SULSU then covers the cost of their per diem for the entire length of stay and submits a bill to the MAF for reimbursement. The MAF deposits an equivalent amount of leones based on the official exchange rate to a SULSU account at the Sierra Leone Commercial Bank Ltd. in Freetown. This account which currently contains about Le 5,000 is controlled by the SULSU Chief of Party and is used to defray local currency costs of the SULSU team such as in country travel. Since this foreign exchange constraint will not be aggravated by long-term training participants who will receive their payments for U.S. expenses direct from SULSU and not from GOSL per diem the problem is sufficiently resolved under the current reimbursement system.

The GOSL contribution to project financing which comes from PL 480 funds and directly from the MAF are deposited into a trust fund account and transferred periodically to the local project account at the Njala branch of the Bank of Sierra Leone

in increments of up to Le 100,000. This transfer requires the signature of the ACRE project director and the Permanent Secretary of the MAF. The late initiation of the transfer process due to a lack of cash flow projections and the slowness with which the transfer itself is affected have resulted in serious cash-flow problems such as late payment of bills and in two instances ACRE borrowed money from NUC to meet short-term obligations. A forecasting of cash needs by accounting personnel and discussion of the transfer process with MAF officials will help to avoid future shortfalls.

The present staffing level of financial personnel within the project is inadequate. Initially it was expected that the Administrative officer would perform these responsibilities along with his many other duties. Besides overburdening the Administrative Officer (who has no training in accounting) this seriously weakened internal financial control since one individual was both approving and disbursing project funds. This situation improved in 1980 by the establishment of a separate accounting department which included a Chief Accountant, an Assistant Accountant and an Accounts Clerk. The position of Chief Accountant was filled by a Peace Corps volunteer recruited specifically for ACRE who had extensive experience in governmental accounting. The Assistant Accountant position is filled by a

person who has studied accounting in Britain although a degree was not received. The Accounts Clerk has no academic training in accounting but has several years of practical experience. Unfortunately the Chief Accountant left Sierra Leone in April 1981 and the position remains vacant. The remaining accounting staff is so overworked with routine tasks such as cashier functions and payroll disbursements that there is no time to prepare financial analyses. At evaluation date some basic accounting records were several months behind. If the accounting staff were complete with a new Chief Accountant and included a second Accounts Clerk the department would be able to produce useful information for project managers. Individual staff members should then be scheduled <sup>for</sup> short term training, either in-country or external.

The procedure for paying the senior extension officers and the five instructors in each zone is to have a Njala ACRE staff member, usually someone from the Accounting office, hand-carry the cash monthly to each region. Signed receipts are then returned to the accounting office. This payment method is both time consuming and weak internal control. Opening a payroll account in each zonal bank branch of the Bank of Sierra Leone would alleviate this problem. Payroll would then be transferred monthly to each branch, withdrawn and distributed by the senior extension officers. Those instructors for whom it is geographically feasible to maintain individual bank accounts could have their paychecks deposited directly to their accounts.

The cost of providing electricity to ACRE buildings is significantly higher than expected. At present the generators belonging to ACRE are used infrequently as a back-up power source to the Sierra Leone Electric Company (SLEC) which provides power to part of the ACRE installation for up to 12 to 18 hours daily.

The fuel cost to electrify the present ACRE facilities with ACRE generators is \$36 per hour since only one generator is needed to meet present needs. However when the laboratory and seed drying facilities are completed it will be necessary to utilize a second generator, thereby doubling fuel costs. Since it is unlikely that SLEC <sup>in the long-run</sup> can provide electricity at a cost lower than ACRE's own generators the annual cost of providing 24 hours electricity to ACRE buildings (assuming two generators are used) can be estimated to be in excess of \$600,000. Given the magnitude of the other recurrent costs it is clear that under present budgetary conditions that the GOSL (which is responsible for utility payments) cannot afford to provide 24 hour electricity for all ACRE facilities. It should be pointed out however that it is USAID through the SULSU contract which must pay for electricity for the homes of the five SULSU team members.

RECOMMENDATIONS - In the requisition procedures for removal of inventory items from the warehouse will be necessary to assure adequate control. A requisition order must be signed by the Project Director, Chief of Party or one of several other authorized persons. After items are given out a copy of the authorization is sent to the accounting department. However there is not a ledger or inventory control book which tells what the inventory level is or what the

(Accounting Firm)

As required in the Project Grant Agreement an accounting firm was engaged to audit financial records regularly. Besides performing the basic audit procedures the firm should be contracted to provide certain management advisory services to help improve ACRE financial management effectiveness and to provide more timely and useful information to AID and GOSL personnel monitoring project progress. A description of the scope of

work for the accounting firm's engagement may be summarized as follows:

1. Review of all ACRE funds disbursed annually.
2. Monitor the financial progress of the project and in particular the drawing down of funds from both the GOSL and the Agency for International Development sources. This is to be done so as to analyze the arrival of inputs in accordance with the plan as put forth in the project document and as amended thus far by AID.
3. Assist in the recruiting/selection and training of GOSL accounting staff for the project and the setting up of a unified accounting system, including liaison with the Project Evaluation Monitoring Services Unit (PEMSU) of the Ministry of Agriculture and Forestry.
4. Develop and monitor a functioning capability within the ACRE Project whereby the Project Accountant and staff will review replenishment requests to AID and GOSL for compatibility with subsidiary project accounts for consistency in presentation and reasonability to advance requests, if any.
5. Review the preparation of project financial progress reports and examine these statements so as to help develop a functioning reporting system of quarterly statements for project management.
6. In auditing the annual financial statements use standard auditing techniques but additionally pay particular attention to the provisions of the grant agreement. The audit will include the direct contribution of GOSL, PL 480 funds designated for the ACRE project and USAID funds for commodities, construction and other costs and to the extent practical AID funds for technical assistance and training.
7. Assist in the preparation of quarterly expense projections by input category for the next annual period.

Special Problems

The official response of the ACRE Project Director to the involvement of the accounting firm which was engaged to review the project's financial activities through December 31, 1980 is in Appendix D. The evaluation team shares the Director concern for increased emphasis on financial management and control.

physical movement is in inventory. The warehouse operator who has physical control of all inventory is the only person who knows what is in-stock. Establishment of a basic inventory monitoring system within the accounting department will greatly enhance control and yield planning information such as reorder levels, excess inventory and stockouts.

The life-blood of the Adaptive Crop Research and Extension program is the staff and the transportation which allows them to carry out their work with the farm families. - Without dependable transportation the project would lose much of its effectiveness.

At the time of the evaluation the present assignment and rapid deterioration of project vehicles is of concern to the evaluation team.

It was originally envisioned that five (5) vehicles would be purchased for the use of the USAID contractor team. Later this was expanded to fourteen (14) four wheel drive vehicles and two (2) trucks.

Unfortunately the USAID Agricultural officer in Sierra Leone at the time of the delivery of the vehicles turned twelve (12) of the four wheel drive vehicles over to the local staff, reserved one for use by the USAID agricultural officer and assigned one to the Ministry of Agriculture and Forestry. When the remaining project vehicles were assigned to personnel of the ACRE project, each USAID contractor professional was not assigned a vehicle.

A review of the assignment shows that several non-field administrative local staff have continuous access to project vehicles for transportation from their houses to the project office and Njala area. At the present time the USAID contract staff have been forced to use their personal vehicles for field use and in several instances have had to cancel work trips because of lack of transportation.

This situation was discussed open and frankly during the evaluation and the Director/ACRE agreed to discuss the reassignment of vehicles with the U.S. contract team leader. The evaluation team feels this should be done soon to help alleviate the transportation problem.

Of equal importance is the lack of facilities for repair and maintenance of vehicles. At best most work vehicles used in the difficult terrain such as Sierra Leone have a life of approximately two years before major repairs are constantly needed. Unfortunately those spare parts which were originally sent with the vehicles are no longer available. Several vehicles at the moment await repairs before they can be reactivated for project use.

If the project is to meet its primary objective of adaptive research and technology transfer, the management of the project (specifically the Director of ACRE, the contract team leader and the USAID Agriculture officer must together take remedial action to solve the transportation problem.

## 9.4 Vehicle

### Special Problems - Maintenance and Operation of Vehicles

AID has financed fourteen FORD Broncos and will be purchasing a total of 70 small Honda motorcycles for ACRE. These vehicles, along with GOSL's seven automobiles assigned to the project and the two Ford medium trucks purchased by AID are essential to project success. The ownership of these vehicles should rest with NUC and five should be assigned to the contract team.

Thus far, the Broncos, which have been in country for slightly over a year are in reasonably good condition. One is out of service with a minor defect, the others are operating. Average mileage is 14,000. Probable usage during the next few years is 17,000 miles a year per vehicle based on the fact that project operations are increasing.

Thirty of the seventy Honda motorcycles are in country and are in use. Most are being used by the extension advisors in the field locations. These cycles provide the transportation flexibility needed by the extension agents to do a good job. Certain problems related to the ownership, use and maintenance of these motorcycles have cropped up. The estate engineer should carefully monitor the performance of the motorcycles and determine if the present system whereby the extension agents purchase the cycles over a two year period and take partial responsibility for maintenance needs modification.

The project outputs and purpose are very dependent upon the establishment and continuation of reliable and efficient

transportation. This in turn is dependent upon the proper types and numbers of vehicles, and proper use and maintenance of these vehicles. The project has yet to establish adequate vehicle maintenance capacity, although some efforts are now underway.

It is recommended that the AID Project Manager and the ACRE Project Director undertake to establish improved vehicle operation and maintenance procedures. As noted, certain efforts are already being made in this regard but such efforts should be intensified.

The recommendations of a recent consultants report should be carried out (The Niles Report). Plans and procedures plans for the use and maintenance of vehicles should include the following. The evaluation team was unable to locate a copy of the full Niles report which probably goes into much more detail than the recommendations below.

### Recommendations:

#### Control and Operation of Vehicles

1. There should exist codified Driver selection, driver performance and driver dismissal standards.
2. Rules of use of the autos by other project and government personnel should be put forth.
3. The project should set standards of routine maintenance by drivers.
4. The project should set standards of vehicle operation by drivers and other personnel.
5. The project should discourage use of Broncos on short personal or job related trips and/or try to encourage pooling to avoid excessive gas consumption.
6. At least five vehicles should be made available, without recourse to the contract team.

7. Assignment of vehicles to individuals should be gazetted.
8. A motor-pool arrangement needs to be considered. Such an arrangement can reduce operating costs.
9. USAID and MAF Freetown should return their ACRE vehicles to ACRE.

#### Maintenance of Vehicles

1. Vehicle maintenance plans including periodic inspections of vehicles by Chief Mechanic and periodic servicing need to be promulgated.
2. The project requires a properly run spare parts, repair parts, tools and consumables stocking and reordering system based on fairly high average use rates and remote area operations. (Parts for Broncos and Honda Motorcycles to be financed by AID. Parts lists developed by Mr. Niles defines the most critical parts)
3. The project needs an improved vehicle repair and maintenance area including:
  - a) work benches and lockers
  - b) repair tools (welding machine, air compressor, jacks, houts, etc.) as well as small tools
  - c) larger graded parking area (perhaps between seed drying plot and maintenance building)
  - d) the maintenance building needs an office with secured area (perhaps two bays of the shop could be turned into office/storage)
  - e) the shop needs correct repair manuals and catalogues
  - f) there should be an underground gasoline storage tank of at least 2,000 gallons controlled by the estate engineer.
4. The project requires a repair staff of at least one Chief Mechanic, reporting to the Estate Engineer, and two Journeymen Mechanics properly trained either in country or elsewhere - reporting to Estate Engineer.

### Motorcycle Operation and Maintenance

1. The present system whereby the extension agents have to bear much of the responsibility and a considerable portion of the financial burden of motorcycle maintenance will need careful monitoring. If it doesn't work it will be a bone of contention.
2. The ACRE Maintenance Center should provide simple operation and maintenance manuals to agents with motorcycles. ACRE should provide a simple training course which agents have to pass before they can have the motorcycles.

### Vehicle Replacement

Without a doubt and even in the best of circumstances certain of the vehicles purchased by AID will be written off or deadlined prior to the 12-31-84 PACD. (Either by ACCIDENTS or through continued use on rough roads). The objective of the Estate Engineer should be to get as much good use out of the vehicles as possible but by 1984 some of the Broncos will be registering over 120,000 kilometers and will be starting to be very expensive to maintain.

The Broncos are extremely wasteful of gas and will become more difficult to service overtime. The Ford dealership in Liberia recently closed and most spare and repair parts will have to be ordered from the US. The ACRE project should ~~standardize on a vehicle suitable for the rough road conditions~~ (the Bronco is suitable) but also reasonably efficient on gas (the Bronco is not). Gas consumption is about a gallon every ten miles or 30¢ a mile. Each Bronco will be consuming \$5,000 of gas per year. (Less if gas taxes are bached out.) A vehicle getting 20 mile to the gallon will only cost half as much or about \$2,500 a year. ~~A few vehicles to be used just for campus~~.

need to purchased. (Perhaps 2-4 small cars)

An ACRE vehicle standardization plan compatible to other GOSL vehicle procurement policies should be established. AID should probably stay away from financing automobiles in the future since standardization will be towards European or Japanese vehicles. Standard vehicles will also provide for easier and more direct local access to repair and spare parts and assure better access to mechanics.

While the procurement of US vehicles by AID in situations which might help to stimulate a market is laudable in some countries it is not realistic in Sierra Leone where there is absolutely no evidence that US auto manufacturers have any interest in the market. It is even impossible to buy the right kind of spark plug for a Bronco in Sierra Leone - let alone any other parts.

# ANNEX A

## Project Coordination and Management

The timeliness of input delivery, the appropriateness of inputs, and the value of outputs could be enhanced through improved coordination and communications more "hands-on" management and more frequent and carefully articulated project directives.

It should be said here, that the evaluation team feels overall that despite a very slow start the project has developed momentum and is now more or less on track albeit somewhat over a year behind schedule. The PP schedule was unrealistic in the first place so overall perhaps the project is a year behind where it could be at this point in time.

The extenuating circumstances of getting this project operating have forestalled putting into place many of the formal procedures which can assist in implementation. Some elements of the project are progressing as somewhat informal procedures for carrying out the same elements are developed. For example, procedures for the selection and placement of candidates for long and short term formal training have evolved over time. Another example is the procedures identifying consultant needs and getting a consultant to the field. Commodity procurement procedures have not developed so far and financial management is wanting. Other sections discuss these problems.

A key to improving some of these procedures is project planning and internal monitoring. Each party to the project needs to improve their planning and monitoring procedures and all need to communicate more frequently on certain matters.

The SULSU contract calls for four basic documents which can assist the Chief of Party, ACRE and AID in project management. These are an annual work plan and budget, an annual review of project performance and strategy and a final report which will suggest ways for development (or continuation) of replaceable delivery and cropping systems. The contractor is also responsible through its evaluation officer for continual monitoring and a semi-annual site evaluation lasting one month.

None of the reports described above have been produced in a satisfactory manner. We understand that the evaluation and monitoring work has been done in an informal way. This should be formalized.

We also understand that the Chief of Party and the ACRE Director with their staffs plan to write up an annual report of project activities this year and will be developing a comprehensive work plan to guide the direction and timing of activities during 1982. The parties will also monitor progress on a periodic basis, USAID Freetown needs to check to see if these activities are carried out as planned.

The executive steering committee is the body which provides or is expected to provide overall direction and guidance to ACRE. It is chaired by the Permanent Secretary, MAF, and in his absence by the Principal, NUC. This committee has met only three times since the start of the project (although it plans to meet November 18th) and unfortunately it tends to discuss items on

salaries, etc. which should have been fully staffed out prior to committee attention. Duly MAF, NUC, AID and ACRE representatives attend despite the fact that high ranking officials of the First Vice President's Office, Ministry of Industry and Trade, Ministry of Finance and Ministry of Economics and Planning are supposed to attend. The absence of the latter is perhaps no loss.

The next level of committee is the Management Directorate chaired by Dr. Taylor, ACRE Director, and attended by the head of research, the head of extension and Chief of Party and others as required. This committee has met even less often than the steering committee. It should be refining and formulating policy for consideration of the steering committee.

The SULSU Chief of Party should hold periodic bi weekly staff meetings with his team. This practice is expected to start soon.

The ACRE director and the directors of research and extension should also hold periodic joint and separate staff and technical meetings. Actually there are many technical level meetings, mainly of an ad-hoc nature and many meetings go unrecorded.

The information to and from all these meetings should be recorded at least for a few months and such information should be provided to the Director, ACRE and the Chief of Party for a several month period during which they can assess the usefulness

of the information for purposes of the project and modify practices as desired.

Both the Chief of Party and the Project Director need assistance in dealing with the myriad of administrative details which diffuse their efforts.

We suggest that the Chief of Party be provided an administrative assistant who does not (should not) perhaps be a new expatriate under the contract but could be an expatriate's spouse. The general job description would be to handle administrative details, not policy.

The ACRE Director should have a deputy for administration. Please note the following which represents the situation today. The Chief of Party, the Research Coordinator and the Extension Advisor would all still report directly to the ACRE Director.

ORGANIZATION CHART  
1981

ACRE MANAGEMENT  
DIRECTORATE

ACRE EXECUTIVE  
STEERING COMMITTEE

DIRECTOR

ACCOUNTANT  
FINANCE  
OFFICE  
AND  
GENERAL  
STORES

ESTATE  
ENGINEER  
BUILDING  
MAINTENANCE  
&  
GROUNDS  
VEHICLE  
SERVICES  
& MAINTENANCE  
GENERATOR  
AND  
PUMPING  
SERVICES

ADMIN  
OFFICER  
- CLERICAL  
SERVICES  
- PUBLICITY  
- GUEST  
HOUSE  
SERVICES  
- PERSONNEL  
AFFAIRS  
- GEN.  
ADMIN.  
MATTERS

CHIEF  
OF  
PARTY  
- AID MATTERS  
- SLASH  
MATTERS  
- AID  
STAFF  
WELFARE

RESEARCH  
COORDINATOR  
- CROPS  
RESEARCH  
- SOILS  
RESEARCH  
- NUTRITION  
RESEARCH  
- INT.  
TECH.  
RESEARCH  
- ECON  
- RURAL  
SOCIOLOGY  
FARM  
MGNT

EXTENSION  
ADVISOR  
- ZONAL  
EXTENSION  
ACTIVITIES  
&  
- OUTREACH  
PROGRAMS  
- TRAINING  
PROGRAMS

ANALYTICAL LABORATORY

However, the Accountant, the Estate Engineer and the Administrative Officer would report to the ACRE Deputy Director for Administration. (Some direct links to the ACRE Director might still be necessary.)

If something is not done the Chief of Party and the Director will continue to be strangled in paper. Their effectiveness can be greatly enhanced by an arrangement such as proposed.

There needs to be a much more effective counterpart relationship. In fact as of now there really isn't a counterpart for the SULSU team members per se except for Dr. Taylor and Dr. Hall. Some counterpart relationships can form organically. Some need a more formal setting. What ever is done needs to be done soon to counter this project weakness. More is said about this elsewhere.

In all one has to bear in mind that ACRE is going through a management shakedown at the same time it is trying to get organized physically. Much evident progress on the matters noted in this section regarding improved communications (except the counterpart situation) has occurred in recent months. A unofficial work plan was approved. The steering committee is becoming more active. The Chief of Party is assuming more management tasks, etc.

Due to the uncertainties in terms of service which continue to exist, ACRE has not yet been able to hire all the people it needs to do a complete job (i.e. No Chief Accountant, for example.)

The steering committee perhaps should be dealing with this issue--but also it should be an issue carefully pursued by NUC, AID, and ACRE some outside the steering committee. The issue of terms of service may well be one of the critical factors that makes or breaks this project over the long run.

ACRE also needs to codify many of its operating procedures. (See financial section also). The evaluation team found extension agents who claimed they had no idea why 30 leones were deducted from each pay check. - (This to pay for the Honda cycles.) More careful determination of responsibilities and authorities will be required at ACRE headquarters to assure a smoother running operation. Aside from the need for an outside auditing firm to continue to monitor the project the beefing up of administrative staff noted here in and in the financial section, more careful definition of higher level individuals responsibilities and authorities and really making the steering committee and management directorate operational it may be of real value to use the SULSU contract to bring in an agricultural extension expert or an agricultural research station administrator (someone with a dual background would be perfect), to review operating procedures in ~~much more depth. The evaluation team does not see this recommendation~~ as unduly critical; rather it is a recommendation to help strengthen the management systems of dynamic organization undertaking an exciting and complex venture in agricultural development.

## Women in the ACRE Project

The original project design stated that

"This project is designed to take special cognizance of the role of women in agricultural development... extension workers will contact women and men smallholders... women smallholders will be provided equal opportunity for participation in the project...women will also be given equal opportunity for training and employment -- in the project and in associated government programs such as the MANR Extension Service... prospective contractors are encouraged to actively recruit women for staffing positions and project staff will be evaluated against their success in seeing that women truly benefit from project innerations and extension activities."

Not much has been accomplished in relation to these high-sounding commitments. In fact, only at the level of the Extension Instructor have any serious accomplishments been made with the exception of the engagement of part-time professional nutrition expertise. Extension instructors were reported to have conscientiously worked with the entire family unit when providing instructions for and working with farm families. The cultivation of some crops, notably cassava and sweet potato, is managed by women and EI's reportedly had no particular difficulties

working with women on ACRE's program with those crops. The ACRE project, though, if it promotes the substitution of groundnuts by sweet potato and cassava in rotations, may negatively affect the economic status of women as in some regions groundnut is their only source of independent revenue. The Nutrition program held a workshop in March, 1981 and plans an expansion of its activities as the project continues.

ACRE has not done anything toward training of women for research, extension, or administrative positions. The evaluation Team noted a strong bias against the idea of women in professional work in agriculture. The only exception was the work of Ms. Sutton as a senior extension officer. Attempts to recruit or train women in the project were not apparent. The U.S. contract team is all-male. If they actively recruited women, they did not have success.

Basic assumptions were expressed by Sierra Leonean staff such as "women in this country do not want to work in (the field of professional) agriculture," and "anyway women extension agents could not survive rural conditions and they would have to work with men...who make all decisions about agriculture in the family

One person interviewed during the evaluation offered an interesting perspective on this question. She is a paramount chief near Senehan and she told the Evaluation Team that young educated women were not appropriate for extension work. She said

this was true because, to go to school, they would have to have been city-raised or at least urban-oriented. Asked if she believed she could be a good extension agent, she responded affirmatively. She could do so because she was used to hard work and rural conditions. Asked if she believed strong young women recruited from rural areas and trained to be extension agents could handle the job, she responded affirmatively.

Cultural and custom barriers to the inclusion of women in development exist in most areas. It is, however, encouraging to note that coordinators of both the research and the extension programs expressed a deep desire to develop programs which address the agricultural production role of women.

During the evaluation the issue of the role of women in agriculture was discussed with ACRE staff, University of Njala staff and personnel from the Ministry of Agriculture and Forestry. It was agreed that the role is a complex socio-economic condition which must be analyzed and dealt with. Perhaps the most important recommendations coming from these discussions was that every effort must be made to develop the education of women for agricultural development. Women should be encouraged to seek university training in agriculture and become an integral part of the system for technology transfer as well as research in agriculture. The project staff must continue to recognize that women should participate in all aspects of program development and implementation. They should be involved in helping define

both the needs and the strategies. Women development and economic self-sufficiency should be the goals. Women need skills that are marketable and directly useful in their daily lives. ACRE should start slowly to design projects which involve women--i.e., health, agriculture, water, infant health, nutrition, wood for fuel, food processing and storage and artisan activities. To the extent possible programs should draw on or seek to strengthen women's existing skills and use resources/and materials which are already available.

### Recommendations

1. ACRE should continue to encourage its EIs to work with whole farm family units when conducting on-farm trials and giving instructions.
2. ACRE should carefully examine which crops are the domain for management by which people within farm families. Substitution of a crop for another especially if it worsens the position of certain members of the family, should be avoided. A balanced approach including, for example, rice and groundnuts would be the kind of effort to be made.
3. ACRE's experience shows that male EIs can work with women on agricultural innovation. While this is encouraging, it should not forestall efforts to recruit and train women for professional work in agriculture on an equal basis with men. Progress to date cannot be judged favorably.

4. The Nutrition Program in the ACRE project should be continued and strengthened as the area most specifically related to women in the farm family. It should be treated equally with all other parts of the program in relation to access to vehicles and other project components necessary to carry out its program.

A project proposal for the nutrition component is shown in <sup>ANNEX</sup> attachment G. This proposal contains the research and extension activities to date as well as the needs for implementation for the next two years.

The evaluation team recommends that this modest program be given high priority in the future activities of ACRE.

## NUTRITION COMPONENT ACRE PROJECT

### BACKGROUND

The original ACRE project paper does not include an explicit nutrition component. The social soundness analysis does point out it is expected that "spread effects will stem directly from increases in food production, hence in consumption and income for small families". The PP goes on to predict that on a "collective level" (macro level) spread effects will stem from "improvements in the quality of life in the rural and urban sectors as incomes and consumption increase".

The National Nutrition Survey of 1978 demonstrated that malnutrition is a primary cause of poor health in Sierra Leone and a major reason why, in some rural areas, as many as half the children die before age five. In Sierra Leone over 24% of the young children are cronicly under nourished. Under-nutrition, lack of sufficient calories and/or specific nutrients adversely affects mental and physical development, productivity and the span of working years (life expectancy in Sierra Leone is 46 years), all of which influence the quality of an individual life and economic potential.

In Sierra Leone, the principal nutritional disorder is protein-calorie - malnutrition (PCM). Nutritional animals are also widespread. The synergistic relationship between nutrition and parasites and infectious diseases results in a high incidence of mortality and morbidity. Women of child bearing age, who perform between 1/3 and 2/3 of the agricultural labor, are in an almost constant state of nutritional stress from repeated pregnancies, prolonged lactation and hard physical labor.

In order to understand the complex causes of malnutrition in Sierra Leone, and to plan for its control, one must consider the inter-relating factors:

- 1) production of foods;
- 2) distribution and marketing of supplies;
- 3) processing and conservation of food stuffs;
- 4) consumption of food; and
- 5) biological utilization.

The ACRE project has been designed to focuss primarily on the first and clearly the most fundamental element, food production.

Worldwide experience has demonstrated that efforts to increase food production and income do not automatically reduce malnutrition as so improve food consumption by low income groups. The purchasing power, preparation methods, cultural preferences and meal patterns, intra - family distribution, breast feeding and weaning practices, educational level. seasonal fluctuations

and family size are all critical factors within the consumption subsystem. In addition, certain strategies for increasing agricultural production through larger farms and costly technologies have favoured the well off farmers at the expense of the subsistence families who then often become landless labourers with less control over their food consumption.

Recognizing all of these facts, the USAID Project Manager and ACRE Project Director decided that consumption/nutrition aspects should receive more attention within the project if the objective of the Government's crop sector development strategy, "to improve human nutrition," is to be achieved.

In late 1979 the ACRE Project Manager requested the REDSO/WA Nutrition Officer to explore with Njala University College Staff the possible development of a nutrition component. Accordingly she met with the acting Head of the Home Economics Department and other professionals to ascertain the interest and capability. It was agreed that further action should wait until the Head of the Home Economics Department returned to duty in February, 1980. In May 1980 an outline of the proposed nutrition component including tentative additions to the PP logical framework were submitted to the Project Director and USAID. These proposals were accepted with minor modifications. A supplementary budget was not prepared because it was felt that the minimal costs for preliminary activities could be absorbed by the project.

#### SUMMARY

The ACRE nutrition component's goal is to improve the nutrition status of families in the target areas, especially children and mothers, through better use of local foods. Project activities in the communities are designed to encourage growth, conservation, and optimum utilization of a variety of nutritious foods within households. The nutrition activities are complimentary to those of the research and extension divisions of the project. ACRE nutrition personnel advise researchers and extension specialists on nutrition considerations of their work and assist them to ensure project interventions have a favourable impact on nutrition status of target groups.

## PURPOSE NUTRITION PROJECT

In addition to contributing towards the overall project purpose, the nutrition component has two "Sub Purposes": (1) to strengthen the capacity of the nutrition unit of the Home Economics Department to design and implement nutrition interventions including audio-visual materials development, training of Agricultural Staff and Field workers and Food technology; and (2) to encourage growth, preservation and optimum utilization of a variety of nutritious Food within rural households.

The conditions that will indicate that the purposes have been achieved (EOPS) are:

1. Nutrition considerations fully integrated into all project activities.
2. Home Economics staff actively involved in food technology research and extension with the college and in the 5 ACRE zones.
3. ACRE nutrition education materials effectively used by Applied Nutrition Extension Agents and other Field Workers in the 5 ACRE zones.
4. Food consumption behaviour within 20,000 rural households, especially young children and mothers, improved with respect to quantitative and qualitative aspects.

Little progress has been made in the actual achievement of the nutrition component purposes. The most basic reason for this is the short time (15 months) since the design of this element of the project was proposed. Since all of the involved parties were engaging in a new area, a great deal of creative thinking and dialogue had to occur in the preliminary stages. Alternative approaches had to be discussed and strategies developed for achievement of objectives. The many crop varieties

to be tested by the nutritionist had to be planted and harvested and brought to the Home Economics Department. All of this takes time, especially when feeling one's way in new territory.

A second element and the most important is the human resources constraint. The ACRE nutritionist is the Head of the Home Economics Department and her full duties there occupy much of her time, although she certainly puts in many additional hours and both ACRE and Department Affairs and teaching. There is no full time nutritionist on the contract team as there is for other disciplines. The REDSO/WA (USAID) nutrition officer as the nutritionist counterpart visits Njala and corresponds with the Project staff as often as her schedule permits. She made 8 trips to Njala in the past 2 years for periods of 2-14 days. The research assistant, who will surely be an important contributor to the project activities under the guidance of the ACRE nutritionist was only hired in July 1981.

While the current staffing arrangement is satisfactory at this time to the nutrition component staff and should be kept for continuity, it is recommended that 1) provision be made within the project for short term consultants to supplement the existing personnel 2) a total of 3 Research Assistants be hired and trained in the areas of Food Technology, nutrition education and public health nutrition and 3) 10 applied nutrition extension agents be recruited and receive in service training in order to accelerate nutrition education and food technology outreach in the 5 ACRE zones, and 4) other Home Economics staff members be

authorized to collaborate on certain project activities on and as needed basis until the 3 Research Assistants are trained. (For example, one instructor participated fully in the nutrition education techniques workshop and could make a significant contribution to further miner materials development).

The third factor contributing to the delay in progress is the inadequate communication between those responsible for the nutrition component and other ACRE staff. The basic reason for this is unfamiliarity with each other's disciplines. In addition, the nutrition component is an "add on" and not yet fully integrated into project plans and documents. The three information sharing meetings proposed in the "preliminary activities" work plan did not take place for a variety of reasons. The Anglophone African Nutrition Education Workshop took more time and energy than anyone had anticipated and consequently less time was devoted to communications with other staff during its planning and implementation. Unfortunately, the ACRE nutritionists did not participate in the ACRE First Work Programme Conference because it coincided with the First Week of the nutrition education workshop. Finally, the lack of regular staff meetings has reinforced the relative isolation of nutrition staff from the overall project implementation process. Finally, one participant was selected and sent for 2 years training in nutrition without any information to the ACRE nutritionists. In addition, the research assistant was selected without an interview by the ACRE nutritionist.

It is recommended that the planned review of the nutrition component activities take place as soon as possible with both

the research and extension divisions of the project. It is also recommended that a representative from the Ministry of Health, knowledgeable about nutrition, be included in the Executive Steering Committee. It is suggested that the ACRE nutritionist continue to be included in staff meetings and that these meetings be held regularly. Finally, high priority should be given to the two nutrition seminars proposed for ACRE staff and other relevant N.U.C. and M.A.F. professionals.

Proposal For Nutrition Component  
of ACRE Project

ACRE Project Nutrition Subgoal; To improve nutrition status of families in target areas, especially children and mothers through better use of local foods.

**Nutrition Survey:**

The use of the very recent National Nutrition Survey Report conducted in 1978 will be used as a base line guide for nutrition status. Small scale baseline survey will, however, be conducted to collect necessary information that is lacking in the National Nutrition Survey Report.

**General Objectives:**

- 1) To develop the Nutrition Component of A Food Crop Adaptive Research and Extension System responsive to the needs of rural small holders.
- 2) To strengthen the capacity of the Nutrition Unit of N.U.C. to carry out detailed nutritional studies of varieties of food crops grown in ACRE project, including nutritional analysis and consumer acceptability studies.
- 3) To encourage growth, preservation, and optimum utilization of a variety of nutritious foods.

**Activities (specific Objectives):**

- 1) To investigate nutritional values of local as well as introduced foods.
- 2) To collect data on local methods of preservation and utilization of food crops, including technologies.
- 3) To study current practices and use of crops by different ethnic groups in ACRE target areas, especially in relation to diets during weaning period.
- 4) To collect information on food beliefs related to particular ACRE crops.

- 5) To conduct research in preparation of ACRE Food Crops for improved nutrition, especially for weaning foods.
- 6) To prepare recipes and methods for processing ACRE crops and test locally available and more sophisticated equipment.
- 7) To develop and test new recipes for preparation of ACRE crops and carry out acceptability tests among consumers.
- 8) To conduct workshop/seminar for field workers and group leaders of farm families on nutrition activities of ACRE.
- 9) To advise research division on crop combinations, crop acceptability and nutrient composition of different varieties. (Advice to be focussed on protein content and biological value but other nutrients and total energy value to be considered as well).
- 10) To develop teaching aids and visual aids for nutrition education and implement a nutrition education program in ACRE zones emphasizing special food needs of various family members.
- 11) To demonstrate special techniques of food preparation preservation and storage to ensure a year round supply of ACRE food crops.
- 12) To develop low cost methods of food preservation.
- 13) To provide in service training for extension nutrition workers of ACRE.

## Goal/Subgoal

The achievement of the nutrition component's purposes together with the broad project purpose, will undoubtedly contribute towards improving smallholder productivity. The realization of the subgoal, "to improve nutrition status of families in target areas, especially children and mothers through better use of local foods", through integrated research and extension activities will be both a result of and a foundation for increased productivity.

It is too early in the project implementation to accumulate evidence indicating changes in nutrition status within the target population due to research or extension efforts. However, it is felt that the planned activities can contribute significantly towards the ACRE goal if they are effectively implemented. The monitoring system will provide data with which to evaluate the impact of project activities on consumption/nutrition status of target families which is the true test of Agricultural Sector improvements.

Overall, the evaluation team concludes that the design of the modest nutrition component is appropriate and logical. If this component is implemented in a timely fashion along with other aspects of the project, it can reinforce their effects on the productivity and nutrition status of smallholders through its complimentary activities.

## Beneficiaries

There are two categories of direct beneficiaries of the ACRE nutrition component. The first group is the 20,000 farm families, women and young children especially, whose food consumption should improve in quantitative and qualitative terms from better use of increased food supplies and income. A positive change in food consumption will contribute towards improved nutrition and health status and ultimately help reduce the high morbidity and mortality rates within this vulnerable segment of the population. Enhanced nutrition/health status will boost mental and physical performance of these families' members. In addition, successful introduction of appropriate food technologies which save women's time and labor as well as conserve benefits in terms of lessening woman's energy expenditure and increasing food availability.

The ACRE nutrition staff are also benefiting directly from participation in the project. Their professional skills will continue to be enhanced through short and long term training, association with specialists and financial/material support for their research and extension activities.

Indirect beneficiaries will include other farm families within the country who can learn from national nutrition radio programs broadcast in the four major languages and who will be better informed on family nutrition through outreach programs. In addition, other ministries and PVO's who utilize ACRE nutrition materials will benefit from the project. Lastly, other ACRE staff with whom the nutritionists collaborate will be professionally enriched.

Preliminary Activities for ACRE  
Nutrition Component

1. Baseline Survey

- a. Target: 60 "pilot" families in each of 5 ACRE areas.
- b. Interviewers: Home Economics students (others if necessary)
- c. Supervisors: Mrs. Dahniya and staff
- d. Information needed:
  - 1) Specific foods currently consumed by families in ACRE areas
  - 2) Specific foods used for diet of weaning children
  - 3) Methods of preparation of particular foods (legumes, cereals and vegetables) and recipes
  - 4) Methods of preservation/storage of particular foods
  - 5) Technologies currently used for food processing, processing, preparation, preservation
  - 6) Food beliefs related to ACRE crops
- e. Time Frame: March-April 1981
- f. Methods:
  - questionnaires
  - observations

Hold meeting to discuss nutrition component of ACRE

- a. role of nutrition unit in research activities
- b. role of nutrition unit in extension activities
- c. joint ACRE seminar on nutrition considerations in ACRE project with key project staff.

3. Ordering/purchasing nutrition books, films, slide sets, etc. for nutrition unit
  - a. prepare list and quantities and prices
  - b. order and receive
  - c. --organize nutrition resource center for nutrition unit and other ACRE departments
  
4. Nutrient analysis capability developed
  - a. Information gathered on equipment/reagent needs and methods
  - b. Laboratory equipped to analyze:
    - caloric value
    - total protein
    - certain amino acids
    - iron content (?)
    - vit. A content (?)
    - calcium content (?)
  - c. Analysis of:
    - 1) nutrient values of varieties of ACRE crops
    - 2) effect on nutrient composition of ACRE crops and combination of foods of various methods of food preservation/processing/preparation/
  - d. Responsibility for laboratory - ACRE Research Unit/Nutrition Unit/Chemistry Laboratory
  - e. Trained personnel (perhaps through United Nations University)
  
5. Purchase necessary local and imported equipment for recipe testing
  - a. Local cooking/preparation/processing equipment
  - b. Imported equipment for processing/preparation/cooking.

## INPUTS NUTRITION PROJECT

To date there have been four categories on inputs within the nutrition component:

- 1) Short-term technical assistance: through the international Nutrition Communication Service, the Ministry of Health Nutrition Officer and the AID REDSO/WA regional Nutrition Officer (counterpart). With the exception of travel expenses for the MOH Nutrition Officer, all services have been paid through other AID funds or the GOSL.
- 2) Long and short term training: Training in planning and implementation of nutrition education programs and audio-visual materials design was provided through the Anglophone Africa Nutrition Education Workshop to the ACRE Nutritionist and one Njala Home Economics Instructor (as well as 5 other Sierra Leoneans). One participant has started 2 years of nutrition training in London.
- 3) Staff increase: One nutrition research assistant was hired by the project in July 1981.
- 4) Materials for research and education: One freezer and a vegetable (fruit sundrying kit have been provided to the Home Economics Department by the Project for use in research. A food preparation equipment list of locally available utensils has been prepared but the equipment has not yet been purchased. Prototype nutrition education materials have been developed through the Anglophone Nutrition Education Workshop Funded by AID/W nutrition office.

The inputs necessary for the next two years of implementation is as follows:

### A. Personnel

<u>1 ACRE nutritionist 24 mos x 150 (supplement)</u>	3,600
<u>1 Research Assistant 24 mos x 270</u>	5,480*
<u>10 Applied Nutrition Extension Agents 2,000/year</u>	
<u>x 1.5 yr ea x 10</u>	30,000
<u>1 Applied Nutrition Supervisor 18 mos x 300</u>	5,400*
<u>Short term H.E. Staff 30 weeks x 3250/week</u>	1,125
SUBTOTAL	45,605 SL
	\$38,765

### B. Technical Assistance

1. LIFE Consultant - 10 days + travel 3,000

2. Seminar consultant - 10 days + travel	3,000
3. Short-term technical assistance 20 person weeks x 500/week	10,000
4. Agriculture Course Development 20 days + travel	<u>4,000</u>
SUBTOTAL	20,000
<b>C. <u>Training Costs</u></b>	
1. Seminar for ACRE	200
2. Seminar for ACRE/MAF and NUC policy makers	1,250
3. Agriculture Insturctors Course	2,000
4. Agriculture Officers Course	2,000
5. Orientation for applied Nutrition Extension Agents	<u>4,000</u>
SUBTOTAL	9,450
<b>D. <u>Field Work Expenses</u></b>	
Survey costs	2,000
Analysis of Survey	10,000
Materials retesting and revision	<u>2,000</u>
SUBTOTAL	14,000
<b>E. <u>Materials and Equipment</u></b>	
Food Preparation Equipment	400
Food Preparation Supplies	800
Refrigerator	600
Materials reproduction (visuals)	2,000
Reproduction and translation of tapes	800
Cassette player and batteries	150
Cassette tapes	200
Appropriate technology activity	5,000
Nutrient analysis equipment and supplies	5,000
10 motorcycles and parts for applied nutrition extension agents	16,000
Nutrition and Food-Technology Reference Books	3,000
Nutrition Teaching Materials	2,000
Camera	200

Slide Projector	200
Generator	500
Slide Film and Processing Costs	300
Art Materials	800
Paper	2,000
Office supplies	<u>400</u>
SUBTOTAL	40,350
Personnel	38,765
Technical Assistance	20,000
Training Costs	9,450
Field Work Expenses	14,000
Materials and Equipment	<u>40,350</u>
SUBTOTAL	122,565
20% inflation and contingency	<u>24,436</u>
	\$147,000*

\*These tables are representative of total expected costs for the new nutrition element of ACRE. Further information regarding who will finance what element and further refinement of costs will be forthcoming subsequently.

## OUTPUTS NUTRITION PROJECT

Certain activities have occurred within the Nutrition component since the approval of the proposed activities:

1. Prototype nutrition education materials have been designed, prototyped and revised at the nutrition education workshop and are ready for further action. These materials are focused on 4 priority problem areas (food storage, diet during pregnancy and lactation, weaning foods and food hygiene) and include flip charts, radio scripts and spots, and flannel board sets. Each audio-visual material has a guide for proper and effective use.
2. The nutrition component baseline survey is designed and the methodology approved by the Research Co-ordinator. This survey which is to be carried out in Dec. 1981 - Jan 1982 will provide detailed information on the factors to be addressed within the nutrition component in order to plan effective nutrition interventions. The total SAMPLE size will be 90 families: 9 ACHE contact farmer families with 9 control families in each of the 5 ACHE Zones. Some baseline information will be used to establish a system to monitor project impact on food consumption behavior.
3. The capabilities of the ACHE Nutritionist and other Home Economics Staff have been improved through short term training and participation in conferences, as well as through working with other nutrition professionals. The ACHE Nutritionist and one Home Economics Instructor participated in the 2 week Anglophone African Regional Nutrition Education Workshop. During this workshop these two staff members learned, through "hand on" experience, the processes of nutrition education program management, message and materials design, prototyping and evaluation. The ACHE Nutritionist attended the International Nutrition Congress and benefited from the exchange of experiences and ideas with other professionals. She also visited the Home Economics and other Departments of Louisiana State University to familiarize herself with their programs and potential for support to the nutrition component. In addition, the development of the nutrition component and establishment of linkages with other nutrition organizations has provided new challenging experiences that have been educational for all.

4. The process of "consciousness raising" with respect to the importance of nutrition/consumption considerations has begun with other ACHE staff. The Project Director and Research Co-ordinator in particular, have discussed nutrition factors and worked with Project Nutritionists to begin incorporating nutritional aspects into the project. The Project Director participated in portions of the nutrition education workshop and was especially impressed during the presentation of Audio-Visual Materials developed for ACHE.
5. Tests on cooking qualities and consumer acceptance of cassava, cowpeas and sweet potato varieties have been done and results presented to the research staff involved. Guidelines for design of tests and recipe development are currently being prepared.
6. Linkages with other groups active in nutrition within Sierra Leone and elsewhere have been created. These Organizations include CARE Project LEARN, Catholic Relief Services, Ministry of Health Nutrition Unit, FAO/WHO/OAU Food and Nutrition Commission for Africa, United Nations University, Meals for Millions (PVO), the International Nutrition Communication service, and the League for International Food Education (LIFE). Some of these groups have provided consultants and/or advice and information. Others have proposed establishment of firm collaborative ties for applied nutrition activities.

The future activities planned for November 1981 through June 1983 are outlined in the attached implementation schedule. The highlights are as follows:

1. Continued Crop Variety Tests and Nutrition Recipe Development. Recipes will be developed for Adequate weaning foods using ACHE cereal crops in combination with legumes (Cowpeas, groundnuts, and pigeon peas). In addition, recipes for complimentary protein dishes using vegetable protein sources will be tested. Testing on crop varieties will continue as ACHE Scientists request review of their crops for cooking qualities.
2. The Nutrition Baseline Survey will be carried out and Analyzed and results used to Plan Interventions. Particular attention will be paid to improving upon current storage, preservation and processing techniques to reduce women's time and energy expenditure and protect food supplies.

3. A Food Consumption Monitoring System will be established. The baseline survey will provide data on certain indicators which can be monitored (every 2 months) to assess project impact on Food Consumption behavior. The possibility of including direct nutrition status measures, i.e. arm circumference or weight for age, will be explored. Data will be analyzed and circulated biannually to ACRE staff for their information and action if needed.
4. Nutrition audio-visual materials will be finalized and utilized. Prototype nutrition education materials are to be retested and further revised if necessary. A schedule for broadcasts of nutrition messages in 4 local languages is to be fixed with the S. L. B. S. Printed materials will be reproduced and distributed to Field Workers who will be trained in their use.
5. Selected Appropriate Technologies for Food Processing, Preservation and Preparation Introduced on a Trial Basis. According to information collected during the baseline survey on time, methods and equipment involved in food processing, storage, preservation and preparation, priority areas will be chosen for improvement. Appropriate technologies will be introduced within certain villages using equipment either manufactured in Sierra Leone or imported.
6. Two Seminars with ACRE staff to be arranged by Nutritionists. The first seminar will be information sharing on each ACRE crop. Topics will include Nutritional Values, Food preparation methods, consumption preferences, and results of recipe development and testing as well as data from other scientists on field trials. The second "in-service training" seminar will be organized for key ACRE, EUC, and MAF staff on nutrition considerations of Agriculture. An outside consultant expert in nutrition planning and policy will be invited.
7. Short in-service nutrition courses for agricultural extension instructors and agricultural officers will be developed. These courses will be offered initially for ACRE personnel and will feature basic nutrition information which can be useful for these categories of extension workers. If the courses are successful, consideration will be given to introducing them into the EUC Curriculum.

8. The Nutrient Analysis capability and requirements will be assessed.  
A food technology specialist from LIFE will analyse the existing capabilities with the ACRE Project and NUC to carry out essential nutritional value tests raw and cooked food. The consultant will advise on necessary equipment and chemicals to be purchased and staff training requirements.
9. Applied Nutrition Extension Agents will be recruited, trained and stationed in 5 ACRE zones. Two (2) female agents will be assigned to each zone and supervised by the ACRE Nutritionist assisted by an applied nutrition research assistant. This new group of field workers will have an important function to disseminate nutrition information developed within the ACRE nutrition component to farm families, particularly mothers. Their responsibilities will include nutrition education outreach to groups, schools, clinics and village groups using ACRE recipes and materials and bimonthly collection of consumption (and nutrition status) data for nutrition monitoring system.

SCHEDULE FOR IMPLEMENTATION OF HCRE NUTRITION PROGRAM DUFFY

1981					1982					1983														
DEC.	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY.	JUN.	JULY.	AUG.	SEPT.	OCT.	NOV.	DEC.

PURCHASE FOOD  
PREPARATION EQUIPMENT

CROP VARIETY COOKING TESTS AND  
DEVELOPMENT OF NUTRITIOUS RECIPES

M.O.H CONSULTANT  
TRAIN INTERVIEWERS  
FOR SURVEY

CARRY OUT  
SURVEY

ANALYZE SURVEY

PRE-TEST AND  
REVISE AUDIO-VISUALS

REPRODUCE AND DISTRIBUTE  
NUTRITION EDUCATION MATERIALS

TRAIN FIELD WORKERS  
IN THEIR USE

REVIEW NUTRIENT ANALYSIS  
CAPABILITY AND ORDER  
EQUIPMENT AND MATERIALS  
BEGIN TRAINING (1)  
FOOD TECH (LTFE CONSULTANT)

SEMINAR FOR  
ACRE STAFF

RECRUIT 10 APPLIED  
NUTRITION EXTENSION AGENTS  
1 MONTH ORIENTATION

POST NUTRITION AGENTS IN 5 ZONES  
DEVELOP IN-SERVICE TRAINING  
AND MONITORING SYSTEM

INTRODUCE APPROPRIATE  
FOOD TECHNOLOGY

DEVELOP AND PREPARE  
NUTRITION EDUCATION MATERIALS

SEMINAR ON NUTRITION  
ACRE - N. UC - MAF

DEVELOP NUTRITION

## INFRASTRUCTURE

AID has provided some 750,000 for constructing primarily for the construction of staff, guest and contractor housing and for the ACRE administrative complex. The latter includes an office building, a research laboratory, a seed storage building, a small warehouse, a garage/workshop and a small generator building. One guest house was built at Rokupr and another is being built near Freetown. The total cost of construction will be at least \$2.3 million some six hundred thousand over original estimates. AID may fund some \$1,150,000 or about 50% of the new total. (See financial for details) (to our knowledge cost overruns have been financiable under the terms of the contract, however this this point should be carefully checked by the mission ADO. (See Financial Section for Accurate Figures.)

Construction of the housing units has lagged approximately twelve to fourteen months behind schedule. The administrative facilities should be finished by December 15, 1981, (except, perhaps, for some minor finishing work and grounds/roads work) some five months behind schedule.

The delays in completing the housing caused some disruption in project implementation, however, delays in fielding the technical assistance contractor team kept this from becoming too irritating. Recent speed-ups in construction work have enabled the contractor to estimate completion of all buildings at approximately 12/15/81 just five months behind the amended schedule but 38.5 months after the grant was executed, instead of the eleven months after grant execution called for in the PP.

The project paper was very unrealistic as to the time required to construct facilities upcountry in Sierra Leone. In addition, all construction in the country was disrupted and contractors were diverted to work on facilities for the 1980 OAU general meeting in Freetown. The foreign exchange squeeze resulting from the large GOSL expenditures on the OAU facilities caused widespread and severe shortages of construction materials and further construction delays throughout the country. Also the design of ACRE facilities and the bidding process itself also took longer than expected so the contract was let much later than originally anticipated.

Nevertheless, as noted earlier, these delays have not been too serious as other elements of the project have also fallen behind schedule.

As noted construction costs have exceeded original PP estimates by a considerable margin. There has been a shift in funding categories under the AID grant and the GOSL has had to increase its local currency contributions to construction above original estimates. It is not yet fully certain that these shifts can be absorbed within the original project cost estimates but there is one leeway in other line items. This will have to be carefully monitored by the ADO.

The buildings were inspected by a REDSO engineer whose report is attached. (Wil Scarborough has copy) The following should be noted in addition to his report.

## UTILITIES

Under specific terms in the Grant the GOSL is responsible for providing power and water service for the project. In addition, under general terms in the grant the GOSL has responsibility for supporting the project over and above available AID funds. GOSL financial support which has flowed through the ACRE project from MAF budget allocations has been timely and adequate.

The projects electricity supply has been dependent upon the Sierra Leone Electric Corporation (SLEC) which runs the generator at NUC. Due to inadequate transmission lines, the lack of dependability of SLEC service in general, and the perceived need for continuous electric service to protect the research lab equipment and the seeds in the drying facility and also to provide dependable service to senior staff and contractor housing ACRE financed the purchase and installation of three 147 KV Blackwood/Hodge generators supporting equipment and a large fuel tank. The system has design flows which are now being rectified, but even with a better set up the costs of running these generators will be prohibitive. ACRE should buy as much electricity as it can from SLEC and use the generators for standby (SLEC's rates, by the way, are way below cost so if the recent IMF recommendations that SLEC raise its rates to recover costs are put in effect ACRE's power costs will increase. See Financial section for operating cost estimates).

The evaluation team suggest that ACRE should look to cut back on its need for electric power (especially in seed storage and soils lab. uses) and try to buy as much of its power from SLEC as possible.

The stress on the NUC/ACRE water system is such that it is almost certain to break down several times during the current dry season. If the single pump quits the entire system will be down until it is repaired, which could be weeks due to the lack of repair parts.

To minimize the problem of interrupted water service NUC and ACRE should have at least three water bowsers on hand. (2 for NUC and 1 for ACRE.) - These bowsers can replenish the small tanks scattered around the campus and the small tanks attached to most homes. A "t" style non-return valve could be fitted to the main supplying water to ACRE houses. The bower could pump water directly by hooking up on the housing end of this valve. In addition, rigid rationing for NUC/ACRE would be required, and one or two additional water tanks properly located might be required. In an emergency, townspeople, students and perhaps even faculty and ACRE staff would have to use pit latrines. (Some have already been prepared.) This temporary situation would probably be accepted for a few weeks as long as everyone is in the same boat. Fire protection would be a problem, however.

There should also be at least two emergency pumps available. These pumps should not be used except when the main pump is out of commission but they should be given periodic tests. The capacity of these pumps will be determined.

Over the long run the entire NUC/ACRE water system needs extensive rehabilitation and improvement. As short run, crisis averting measures are being taken, the GOSL should also undertake a study of the requirements for water for the Njala area and the physical plant necessary to meet such requirements. This study should take into account water quality and should use best available estimates of the population and activities at Njala for at least the next twenty years. Any system improvements should be built with an eye towards future growth of demand. Demand is somewhat controllable by water availability and water quality so the study needs to take into account minimum and maximum acceptable levels of service.

The GOSL should also provide NUC, ACRE staff and AID a report detailing the problems and prospects of an EEC (FED) project which was to (among other things) fund an improved water supply to Njala.

To recount; the gross physical deficiencies in the present system include:

1. inadequate pump capacity
2. no redundancy in pump (one pump)
3. no spare parts for pump
4. inadequate operating procedures
5. no fine filtering of river water
6. no water purification (unhealthy water)
7. overtaxed system overall
8. seriously deteriorated water mains
9. very inadequate provision for emergencies

10. insufficient water pressure
11. severely overtaxed system at the extremes of service
12. no real control over use and no system of user charges based on actual consumption
13. inadequate system for fire protection
14. absolutely no standby capacity

These deficiencies are so pervasive that the system is bound to give out and both NUC and ACRE will suffer. The contractor staff morale will drop. (Not to mention morale of ACRE staff NUC staff students and townspeople.) In fact a severe or prolonged water shortage trigger student action of some kind or another.

The Steering Committee must appeal without delay to the highest authorities for emergency-mid-range and long range assistance in providing adequate water to Njala. Without positive action on this it is doubtful if AID could expect a successful outcome from ACRE.

The consultant mentioned previously should also estimate costs of all emergency, interim and permanent measures worth consideration. AID should look favorably on supporting at least part of the financial costs of all three measures, and fund ~~at least part of the emergency and interim measures if funds are~~ available. Just if for no other reason than the projects' existence will be threatened if water is not available.

## Buildings and Site

The evaluation team found that the buildings were in reasonably good shape (as per Mr. Eldridge's report). However, there are a few design flaws and/or omissions of work which need correction. These are 1) the warehouse is too small and allows no special storage for fertilizers 2) the generator building is too small not properly ventilated 3) the site is not graded or landscaped 4) buildings are almost complete some road work remains and all work now contracted should be finished by year end. Of such a program is instituted on a regular basis, consideration should be given to providing dormitory and classroom space to extension agents and/or leading farmers obtaining specialized training at ACRE. This may not be obtainable in phase I.

The total of miscellaneous utility and construction items unfunded (not including utility operating costs - see financial section) may be such that ACRE I could fund only a small part of such improvements. Careful priorities may have to be set.

AID Documentation

The project seems to be working quite well despite spotty AID documentation. The Project Paper is quite good in some respects and outlines a challenging and state of the art program; however it is lacking in such things as detailed cost estimates, procurement planning and other project management considerations. The Grant Agreement is not the most tightly written document in the world and the AID/SULSU contract is a poorly written document. One can note contradictions in the Grant Agreement. For instance Section 5.5 does not agree with para 4 of Annex A. Section 5.5 says "Grantee agrees to establish the Project as a Semi Autonomous unit with strong linkages to the Njala University College and the Ministry of Agriculture and Forestry." Para 4 of Annex A states "Njala University College will have principal responsibility for project operations with the full cooperation of the MAF through the Rokupr Rice Research Station and the network of Principal Agricultural Officers in the areas of Project operation.

The SULSU contract leaves much to be desired and should perhaps be modified if such can be done before another funding tranche is made available. Dates need to be stated. The contractor needs to be held responsible for reports, etc. The key main clause has not been enforced probably because there is a clause about housing which protected the contractor.

USAID has been very remiss in not issuing basic or for implementation letters as called for in the Grant Agreement and as generally dictated by AID regulations. Two abortive attempts have been made to structure a PIL #1 but no PILs have actually been issued. While there is no reason to suspect the goodwill this project has will diminish, AID should clarify the ground rules under which its assistance is being provided through PILs.

PIO/Cs, PIO/Ts and PIO/Ps are not always cleared by host government and/or the contractor. It is in the best interest of the project to have all important PIOs cleared by each party and to assure copies of all PIOs, no matter how small, be forwarded to all parties and to REDSO/PDO and REDSO/WAAC (as well as AID/W as necessary).

AID should also set planning goals and monitor in a periodic basis. With the severe staff constraints this has to be kept to a minimum and could perhaps be handled by the A with help from the PL-480 assistant.

REDSO needs to provide direct assistance on commodities (noted elsewhere) and a legal advisor should review the basic project documents. Other REDSO staff will be needed from time to time (Project Officer, engineer). There is no doubt that USAID Freetown will have to lean a little heavier on REDSO for assistance on this project. However the ultimate responsibility rests with the AAO.

# ANNEX F

## Project Information Needs--Baseline Survey, Project Monitoring, Project Evaluation

Project design called for formative evaluations to be carried out every six months by the U.S. contractors, a mid-project evaluation, and an end of project evaluation. Information for the exercises was to come largely from measurements of project performance provided by project monitoring of activities and changes in the participant population from a measured baseline of agronomic, economic, and social factors.

The U.S. contractor, SULSU, has been negligent in fulfilling its agreement for six-month formative evaluations. Only one has been carried out. Its utility was judged not to be outstanding. The inability of the contractor to carry out this work impairs ACRE management's ability to judge the accomplishments and short comings of the project.

The mid-term evaluation has been conducted by a team of AID officers from AID/W and REDSO/WA. We hope that it will provide a useful assessment of the project.

Project monitoring activities have involved the work of ACRE project research personnel and part-time enumerators. Many ~~difficulties arose in relation to the baseline socio-economic~~ study, the appropriate technology survey, and are recurring under the extended socio-economic baseline survey. The problems stem basically from a lack of understanding of the information needs for implementation and evaluation of the project.

~~Problems included:~~ 1) unreliability of information due to

biasing of sampling and misleading information supplied by enumerators; 2) unnecessarily complex information requirements causing difficulties in use of the instrument and delays in analysis of results; 3) loss of credibility for the project as a whole due to frustration and disappointment on the part of farmers when misled by enumerators and harried by extremely tedious questioning; and 4) the reliance on farmer recall of details of events in the past including quantification of information, such as labor inputs, for which the farmer is completely unaccustomed.

This project requires the on-going collection of information which must be both detailed and accurate. It must be so because the project is testing and promoting incremental changes in farm management. Information generated will be used for deciding basic directions for agricultural development in Sierra Leone in the future. One-shot, overly complex, and biased information collection does not meet this need.

The opportunity exists in the project for careful, accurate repetitive, and detailed information collection. This can be done through the use of a field research team consisting of survey experts, research specialists, research/extension officers, and contact farmers, working together to determine information needs and meet them. The best means to do this is to have consultations between the people involved to find an effective

way of collecting information. The reporting system could include farmer record keeping, EI record keeping, or a combination of both. Illiteracy might hamper farmer record keeping in the case of the ACRE farmers. In that case, EIs could be trained to collect information on a weekly basis concerning labor organization, farming activities, consumption, and exchange/sale by the farm-family. Various standard forms exist and could be adapted to ACRE needs. SEOs could also be trained in managing data collection. Both groups could be trained to do preliminary analysis and coding of data. ACRE research staff and outside experts could be recruited to work in the effort but extension personnel should not be relegated to a position of mindless data collections. Rather they should actively participate in the definition of data needs and in its analysis.

### Recommendations

1. Survey work, based on one time complex questionnaires administered by enumerators recruited solely for the purpose of the survey, should immediately stop. Inaccuracy based on lack of rapport and overly demand farmer recall by enumerators and irrelevance based on lack of understanding of the rural situation by research staff are the causes for the need to halt survey work.

2. Farm management, on farming systems, research should be the means of data collection for project monitoring. Farmers, extension personnel, research staff, and appropriate outside experts should work together to provide reliable data through

weekly use of an instrument which will provide data on all key variables in the process of technology adaptation and transfer.

3. Training in record keeping may be given to farmer if this is judged feasible. In any case, data collection and analysis principle and technique should be explained to all farmers, extension, and research personnel. If extension personnel are to collect the information, they (EIs and SEOs) should be trained in data collection and analysis. Research staff should do all necessary back-up work including coding, calculations, and statistical analyses. Outside experts may be involved in training, data collection, data analysis, and report writing. The ACRE U.S. trained rural sociology PH.D. candidate, Sierra Leonean expert such as Dr. John Kapina of Forah Bay College or Dr. Harry Turay of NUC, or consultants provided by the SUBSU contract would be possible sources for experts.

4. Any data collection and analysis efforts, other than the farm management monitoring operation, should do as much as possible to involve farmers and extension personnel in research. At least, the purpose and results of research should be made clear to farmers and extension personnel. If possible, researchers should allow these people to participate.

5. The SULSU contractor should provide the six-month evaluation reports called for in the contract for the ACRE project.

APPENDIX A  
Attachment A

Sierra Leone Adaptive Crop Research and Extension project

Persons contacted by the Evaluation Team

Southern University and Louisiana State University (Contractor)

Dr. V. Hall - Team Leader  
Dr. J. Beacher - Soil Scientist  
Dr. D. Tuthill - Agri. Economist  
Dr. J. Henshaw - Tropical Food Crops  
Dr. A. Agard - Extension Agronomist

ACRE Project Staff

Dr. W. Taylor - Project Director  
Dr. E. Rhodes - Research Coordinator  
Mr. E. Mammy - Extension Coordinator  
Mr. E. Lansaneh - Estate Engineer  
Mr. T. Mbawa - Field Assistant  
Mr. F. Ngegbeh - Senior Agr. Officer  
Mr. P. James           "       "       "  
Mr. M. James         "       "       "  
Mr. S. Kassib         "       "       "  
Mr. J. Squire         "       "       "  
Mr. E. Ellie - Extension Instructor  
Mr. D. Wai           "       "  
Mr. L. Jabatie       "       "  
Mr. S. Lebbie        "       "

Mr. F. Brima - Extension Instructor		
Mr. A. Basigbayei	"	"
Mr. A. Lakoh	"	"
Mr. S. Harding	"	"
Mr. J. Lappia	"	"
Mr. A. Mansaray	"	"
Mr. J. Williams	"	"
Mr. F. Bangura	"	"
Mr. M. Bangura	"	"
Mr. M. Ngaima	"	"
Mr. A. Gassama	"	"
Mr. P. Jusu	"	"
Mr. M. Turay	"	"
Mr. A. Lansana	"	"
Mr. E. Sesay	"	"
Mr. A. Sandi	"	"
Mr. F. Kamara	"	"
Mr. B. Momodu	"	"
Mr. D. Vandi	"	"
Mr. J. Momoh	"	"
Mr. F. Harry-Sillah	"	"
Mr. P. Kamara - Research Assistant		
Mr. J. Tucker	"	"
Mr. D. Kamara	"	"
Mr. K. Sesay	"	"
Mr. M. Fornah	"	"
Mrs. E. Kpolie	"	"
Mr. T. Winneh	"	"

Njala University College

Dr. J. Kamara - Principal

Mr. W. Kuvembeh - Acting Dean

Mr. C. Pyne - Staff N.U.C.

Dr. A. Sesay " "

Dr. H. Turay " "

Mrs. F. Dahniya " "

Mr. A. Koroma " "

Mr. A. Koroma " "

Mr. N. Kuyembeh " "

Mr. D. Katewu " "

Mr. J. Kamara " "

Dr. M. Dahniya " "

Mr. S. Kamara " "

Dr. G. Nyoka " "

Mr. D. James " "

Ministry of Agriculture - Sierra Leone

Dr. A. Joe-Jackson - Minister of Agriculture

Mr. W. Munu - Permanent Secretary

Mr. L. Feika - Agr. Officer

Mr. G. Yates - PEMSU - MAF

Mr. D. McClure - Project Coordinator, MAF

Mr. A. Siafa - Chief Agriculturist

Bockarie Conteh (Yufuni)  
Kailie Mara (Sedia)  
J.L.E. Turay  
Abdulai Kamara  
Kainessie Katta  
Abu Thomas  
Julius Lebbie  
Julius Bavo  
Kini Ngagba  
Brima Ansumana  
Alhaji Konneh  
Brima Moijue  
Brima Sovula  
Moinina Njamanga  
Musa Sesay  
Abu Ballay Sankoh  
Momoh Sisi  
Ibrahim Suma  
Gbema Kamara  
Nunu Kargbo

APPENDIX **B**

Summary of USAID and GOSL Contributions

USAID Contributions:

<u>FY</u>	<u>Amount of Grant</u>
78	\$ 900,000
79	1,270,000
80	165,000
81	2,585,000
	<u>\$ 4,920,000</u>

USAID Inputs:

<u>Input</u>	<u>LOP Budget</u>	<u>Obligated (9/30/81)</u>	<u>Disbursed (9/30/81)</u>
Technical assistance	\$ 3,737,000	\$ 1,993,500	\$ 403,100
Training	454,000	274,600	59,900
Commodities	741,000	1,298,000	512,300
Construction	735,000	1,152,400	720,200
Support/Other costs	415,000	231,500	36,400
	<u>\$ 6,082,000</u>	<u>\$ 4,920,000</u>	<u>\$ 1,731,900</u>

GOSL Contributions: (1 leone = 85 cents U.S.)

<u>FY</u>	<u>Amount</u>
79	Le. 788,000
80	1,750,000
81	1,075,000
	<u>Le. 3,613,000</u>
October 1981	700,000
	<u>Le. 4,313,000</u>

APPENDIX B-C

Project Budget Assuming the \$943,000 Reserved is Authorized

	<u>LOP Budget</u>	<u>Obligated</u>	<u>Disbursed</u>	<u>Unliquidat Balance</u>
Technical Assistance	3,998,000	1,993,500	403,100	1,590,400
Training	716,000	244,600	59,900	184,700
Commodities	741,000	1,298,000	512,300	785,700
Construction	1,155,000	1,152,400	720,200	432,200
Support/Other Costs	<u>433,000</u>	<u>231,500</u>	<u>36,400</u>	<u>195,100</u>
	7,043,000	4,920,000	1,731,900	3,188,100

(as per WAAC/REDSO/WA 9/30/81)

Appendix **D**Sierra Leone ACRE Project Schedule To Compute Budget Balance of  
Subsidiary for the Period Ended September 30, 1981

Category	Budget Amount	Expenditures To Date	Budget Balance
Salaries	1,190,000	281,811.97	908,188.03
Fringe Benefits	161,100	46,165.05	114,934.95
Travel and Trans- portation	754,100	135,088.86	619,011.14
Allowances	579,500	73,844.73	505,655.27
Other Direct Costs	93,400	28,775.76	64,624.24
Indirect Costs	445,200	83,541.26	361,658.74
Training	630,400	-	630,400-
<b>TOTALS</b>	<b>3,853,700-</b>	<b>649,227.63</b>	<b>3,204,472.37</b>

## Footnotes:

- 1) Schedule is a restatement of the September 30, 1981 Quarterly report prepared by the office of the Vice President for finance and business affairs.
- 2) Schedule is prepared on the cash basis.
- 3) ~~The above~~ does not include expenditure and outstanding obligations for the period October 1, 1981 through November 11, 1981; which is estimated at about \$150,000.
- 4) Short term training cost is not included in the above

E  
Appendix.

DIR/PR/210

26th October, 1981

Mr. Alex Dickie  
AID Affairs Officer  
U.S. Embassy  
Walpole Street  
Freetown

Dear Sir:

Auditors Review of Funds - ACRE Project

I have discussed with our Accountant the Auditors report on the review of the disbursement of ACRE funds for the nine months that ended in December 1979. The following are my comments on the poor state of the records and the internal control at the time.

I strongly feel that the blame for the unsatisfactory state of affairs then should be shared equally between both AID and MAF. The proper machinery should have been set up include a system of periodic auditing of the accounts. This would have ensured that proper accounting procedure was followed. As has been indicated in the report the system of disbursement was one in which the Admin. Officer who in my knowledge is not a wualified or experienced accountant, "was both approving and disbursing funds for the project".

This unsatisfactory situation should not have been allowed. However, since this was disbursement of Government of Sierra Leone funds I feel that the auditors report should be looked at in that light. As far as I am concerned, we have the reports of the trials for 1979 and this will be useful to both the present and future activities of ACRE.

The Director of ACRE was appointed in March 1980. During the period March/December 1980 we have tried to initiate a proper accounting system with the help of Mr. Spencer Bryan (Accountant Trainer), and Miss F.B. Ngegba (Asst. Accountant in Training), and an Accounts Clerk. I still feel that more should be done to get more staff for the many important functions of this are. Presently we are making efforts at recruiting a full complement of staff to man the Accounts section of the Project. I am recommending that more emphasis be put on the state of the accounts as from 1980/81 Financial Year.

Yours faithfully

W.E. Taylor  
DIRECTOR, ACRE

WET/amb.

cc: Wil Scarborough - ADO  
Charles Uphaus - Agric. Econs  
Asst, Accountant - ACRE.

Farm Survey Form

1. Name:

Date:

2. Location

3. Family Labor Composition

Adult Males

Adult Females

Children

4. Crop Raised

Name

No. of Acres

House

Fields

5. Labor

Family Hired Exchanged

# Days

Amount Paid

Brushing, Felling

Land Preparation

Weeding

Harvesting

6. - What trials and demonstrations are present on the farm?

How does farmer interpret results to this point?

Does he know costs of labor/cash/material involved in techniques being tested or demonstrated?

Does he plan to expand the use of the technique or material on his own land next year?

If so, how many acres will he try?

Does he feel that increased yield will cover any increased costs?

7. - How many people have come to see the plot in the last two weeks?

How did they assess the results?

Did they ask you and did farmer or EI explain to them techniques or materials involved?

Did they want to try the technique or material on their own land next year?

8. When did you last see the Extension Instructor?

How often does he come here and work with you on the plot(s)?

Who did the labor on these plots?

9. What problem do you have in relation to improving your farm?

APPENDIX

Annex

G

Summary of labor force composition and crops grown in various zones of ACRE project

ZONE	Average household labor force composition	Crops grown in vicinity of village	Kind of rice grown and average acreage	Crops grown in multi-crop association with land rice
NJALA	1.67 adult male 2 adult female 1.83 children	Okra, orange, sweet potato, cassava, papaya, vegetables, mango, bananas, pineapple, coffee	IVS upland, boliland 2.9 acres	Maize, cassava, groundnuts, sweet potato, benniseed, pearl millet, sorghum, broad bean, agusi, valgaril
KENEMA	3.83 Adult male 3.67 adult female 5.5 children	Orange, coffee, cocoa, cola, banana, plantain, sweet potato, coconut, oil palm, cassava	Upland IVS 3.25 acres	Pearl millet, broad bean, pumpkins, sorghum, agusi, sweet potato, oil palm, sor
ROKUPR	4.67 Adult male 3.17 Adult female 4.67 children	Orange, mango, bananas, plantain, cola, timber, sweet potato, pumpkin	Mangrove, IVS Upland 3.58 acres	Pearl millet, broad bean, citrus, cocoy, sorghum, pigeon pea, groundnut, maize
MAKENI	5 Adult male 4.5 Adult female 5 children	Sweet potato, cassava, oil palm, vegetables, citrus, mango, maize, coconut, cocoyam, pineapple, sugar cane, banana, pumpkins, garden eggs, cola, beans, orange, cowpea	Boliland Upland IVS 8.16 acres	Cassava, pigeon pea, papaya, sorghum, bean, benniseed, pearl millet, cowpea, maize, lime, bananas
KABALA	2.2 Adult male 2.6 Adult female 2 children	Okra, orange, sweet potato, cassava, cocoyam, mango, guavava.	IVS Upland 3.75 acres	Maize, groundnut, sorghum, pearl millet

Summary of labor expended in crop production in various zones of ACRE project.

ZONE	Average person days per acre in land preparation by type of rice cultivation and source of labor	Average person days per acre in weeding rice by type of cultivation and source of labor	Average days per in harve by type cultivat source o
NJALA	37 days hired labor labor swamp ----- 11 days exchange upland	18.6 family IVS ----- 33.6 family Boliland ----- 18 hired IVs	90 famil 30 hired 12 hired lands 39.2 fam lands
KENEMA	20 days swamp hired ----- 33.6 family upland ----- 14 hire upland ----- 5 days exchange upland	34 family upland ----- 3 hired IVS ----- 30 family IVS	70 famil 4 hired 48 famil land
ROKUPR	46 hired IVS ----- 72 family IVS ----- 150 hired mangrove ----- 90 family mangrove ----- 44.2 hired upland ----- 10.5 exchange upland	33 family IVS ----- 65 family upland 28 hired upland ----- 45 family boliland ----- 37.5 hired IVS	65 famil 42 famil 60 famil rove 41.2 hir mangrove
MAKENI	2 exchange boliland ----- 25 hired upland ----- 52.5 hired swamp		35 hired 10 hired land 60 excha bolil 70 famil land 30 hired
KABALA	20 Exchange IVS ----- 19 hired IVS ----- 74.6 hired upland	14.5 family IVS ----- 15.7 exchange IVS 78 hired swamp 22 exchange upland	7.5 exch IVS 23.3 hi

## Selection Instrument for New Contact Farmers

The following brief set of question could be used to select new contact farmers for further ACRE Project Activities. They should be used with the key authorities at the village level. They should preferably be asked on an individual, one-on-one basis, but if this is not possible, they can be used in a group setting.

First, you must get a list of all possible candidates to be contact farmers. Then determine how many more contact farmers you can add to the program from that village. If, for example, you can three, then begin every question with "Who are the three best farmers in this village for ..." and finish the question with the item below. Do not ask for more suggestions that you have openings for contact farmers.

### Items

1. Who are the number best farmers in this village?
2. Who are the # most helpful farmers in this village?
3. Who are the # most knowledgeable farmers in this village?
4. Who are the # farmers most dedicated to farming in this village?
5. Who are the # most respected farmers in this village?
6. Who are the # wealthiest farmers in this village?

After recording answers, match answers to questions 1 to 5. Question 6 should be a check to see if wealth is the basic criteria for judgement of quality of farmers. If you are familiar with the candidates for contact farmer, answer the questions yourself. Count the frequency of mention of farmers in answers to questions 1 to 5 and select your new contact farmers from those most often named. Discuss your selection with village authorities before notifying those selected, in case the authorities want to override your choice. If they do, consult your SEO. If they are approved, notify the new contact farmers and your SEO. KEEP ALL RESULTS OF QUESTIONING STRICTLY TO YOURSELF AND YOUR SEO.

DATE: October 27, 1981  
 REPLY TO: *L. M. Eldredge*  
 ATTN OF: Louis M. Eldredge  
 SUBJECT: Trip Report - Sierra Leone ACRE Project  
 TO: Gordon W. Evans  
 Thru: Robert Payette  
 William Naylor

Dates: October 20 - Abidjan to Freetown  
 Oct. 21-22 - To N'Jala and Rokupr - Freetown  
 Oct. 23 - Freetown to Abidjan

Participants: Wilbur E. Scarborough, USAID/Freetown  
 Dr. Vernon L. Hall, Chief of Party  
 Gana A. Lanasanah, Estate Engineer  
 (Assigned to ACRE Project from the  
 Ministry of Agriculture and Forestry)  
 Louis M. Eldredge, REDSO/WA Engineer

Purpose of Visit: To inspect progress on construction of  
~~buildings completed and/or under construction as a part~~  
 of the ACRE Project, financed with AID funds.

Itinerary:

Tuesday, Oct. 20: I departed Abidjan at 21:15 arriving at  
 Freetown airport at 22:50. With my usual good luck, which  
 to follow me wherever I go, the lengthy trip from the airport  
 to the hotel in the city should have been no surprise.  
 Shortly after the ferry left the pier from the airport since  
 it developed steering and engine problems. After about a  
 hour of zigging and zagging, going forward and backward,  
 they finally called for a tug boat to come and tow it to  
 destination. I arrived at the hotel after 03:00.

Wednesday, Oct. 21: Wilbur Scarborough, the USAID Project  
 Manager for the ACRE Project, picked me up at the hotel at  
 07:30, and after a quick stop at the Embassy to cash a check  
 we were off to N'Jala. We arrived at N'Jala Agricultural  
 Research Station, and site of the headquarters for the ACRE  
 Project, at about 11:00. An introductory call was made to



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Dr. Taylor, Project Director of the ACRE Project at which the purpose of my visit was explained along with the proposed schedule for the Project Evaluation Team's visit the following week. I was also introduced to Dr. Vernon Hall, Chief of Party for the Technical Assistance Team from So. Louisiana Univ. and Mr. Gana A. Lanasanah, the Estate Engineer assigned to the ACRE Project from the Ministry of Agriculture and Forestry, both of whom accompanied us on the remainder of my inspection tour of the facilities at N'Jala and Rokupr. Each building at Site II listed below was individually inspected, all of which, except for the Administration block, are not yet finished, but are nearing completion. Individual comments on their construction status will follow in the Inspection Report, attached. We then inspected a representative sampling of the Site I buildings. As these residences and rest houses are complete and most of the residences occupied, we didn't inspect each and every one of them.

At Site III, the 16 one bedroom houses were still under construction with final finishing work still in progress. We visited the pumping plant which supplies raw river water through an existing elevated storage tank to both Site I and II facilities, and discussed its operational problems and needs with various Research Station officials. We spent the night at one of the rest houses. It proved to be a very comfortable and well constructed facility.

Thursday, Oct. 22: We departed N'Jala at about 0800 and arrived at Rokupr Rice Research Station at about 1200 noon. After an introductory visit with the Research Station Officials we inspected the ACRE Project rest house, which is located adjacent to the Research Station rest house and facilities. Upon concluding our inspection, and partaking of an excellent picnic lunch brought by Dr. and Mrs. Hall, Mr. Scarborough and myself departed for Freetown - arriving there about 5:30 p.m.

Friday, Oct. 23: I met briefly with Mr. Scarborough, Mr. Charles Uphaus and Mr. Alex Dickie to pick up copies of the A&E contract and the construction contract bill of materials and construction specifications to use in comparing the actual construction with the design requirements. As it was necessary to catch the 0800 bus to the airport, I was unable to visit the rest house building under construction in Freetown. My flight left Freetown Airport at 1100 and arrived in Abidjan at 1235.

**ACRE PROJECT FACILITIES**

**N'Jala:**            Site I - (20 buildings)

(8) - three bedroom residences  
(2) - four bedroom rest houses  
(10) - two bedroom residences

Site II - (6 buildings)

Administration Block  
Seed Handling Block  
Soils Laboratory  
Stores Warehouse  
Maintenance Centre  
Electrical Generator Building  
Open Seed Drying Floor

Site III - (16) - one bedroom residences

**Rokupr:**            (1) - four bedroom rest house

**Freetown:**        (1) - rest house (under construction)

Inspection of Buildings at the ACRE Project Sites of  
N'Jala and Rokupr, Sierra Leone, October 21 and 22, 1981

FINDINGS AND COMMENTS

ACRE FACILITIES

N'Jala: Site I - All 20 buildings are complete and most of them occupied. Construction appears satisfactory with no major problems.

The contractor has had to re-lay portions of the PVC floor-tile due to "bleeding" of the mastic cement with which it was laid. This problem was found in several of the buildings and may be the result of use of defective or improperly applied mastic cement.

Another defect is in the use of emulsion paint on the underneath of the eaves and on the garage ceiling. The use of this type of paint on the exterior surfaces in the damp climate should not have been specified. The paint is already scaling off these surfaces and in addition to creating a nuisance, it will allow rapid deterioration of the wood surfaces.

A related problem pertaining to the water system has resulted from use of raw river water which is being pumped into the system without any filtration or treatment. At times, the river water is very dirty and carries rather large amounts of heavy debris and sediment which rapidly clogs the valves and storage tanks in the individual houses. It is recommended that some method of filtering or screening be arranged to eliminate as much of this as possible.

Also, it was noted that the one engine-powered pump used for pumping the water is being operated for long periods each day with no stand-by unit in case of break-down. A second pump should be available, not only as a stand-by unit, but to be used alternately with the present pump to reduce its overloading. It was reported that two new pumps had been ordered for the water system, but have not been delivered to the station. Mr. Scarborough was to check on their status. It should be mentioned that the supply of water and electricity to the ACRE facilities is the responsibility of the GOSL and ~~is not funded by AID.~~

Site II - Administration Block: This two story office building is complete and functioning. The only present problem is inadequate water supply pressure due to too small a supply pipe. A new line has been surveyed and planned for the future installation.

**Seed Handling Block:** Complete, except for installation of related refrigeration and drying equipment.

**Soils Laboratory:** Internal benches and testing facilities are being constructed. Electrical wiring and finish work is yet to be done. Present construction is satisfactory.

**Stores Warehouse:** Complete. However, the design of the walls have areas where large openings could allow wind-driven rain into the warehouse and cause damage to items in storage. Also, there is no ceiling under the aluminum roofing which may cause the warehouse to become very hot.

Shelving should be constructed so that small items could be stored more efficiently. They are now stored on the floor. Also, the large appliances and equipment should be stored on pallets to escape the dampness on the concrete floor. It was noted that the concrete surface of the floor was not smooth or even and was fairly loose and sandy. It apparently was not cured properly or lacked proper ratio of cement. It will deteriorate rapidly under heavy equipment use or dragging of storage supplies.

**Maintenance Centre:** Complete, except for access ramps to the building. The steel roll-up doors are very light and some need rework of the side guide rails to permit proper operation. Also, they do not make an even contact with the concrete floor due to its unevenness. Concrete thresholds are yet to be installed.

**Electrical Generator Building:** Complete. Modifications to the existing outer wall will be necessary to allow adequate ventilation from the diesel powered generator engines and a heavier support is needed to adequately anchor and support the engine exhaust pipes. The equipment installers are presently working on these problems.

**Site.III -** The 16 one bedroom residences are nearing completion. There were no evident problems at this site.

**Rokupri:** The four bedroom rest house is complete except for connection of electrical service from the power source. This connection was scheduled for completion next week.

There were a number of finishing problems evident at this site, perhaps as a result of this one building being constructed so far from the project center and the resulting lack of continuous supervision by project personnel. It was reportedly constructed by a sub-contractor other than the one constructing the houses at N'Jala.

A more serious problem was discovered in checking the batten strips on the ceiling. They were full of termites and had left a pile of sawdust on the bedroom floor. Poor quality, untreated wood had been used. Other evidence of similar possible termite infestation were indicated throughout the building. It is recommended that a thorough inspection of the entire building be made to see if the structural timber, particularly in the roof structure, was treated according to the specifications and all affected timber be removed and replaced.

Other items noted were:

- paint peeling on ceilings and skirtings (wood not cleaned or sanded before painting.)

floor tile improperly laid (bleeding and buckling.)

painting work throughout poorly done, no sanding before or between coats, application of required three coats is questionable.

window sills not tapered to drain off accumulated water

window screens improperly installed. Strip at bottom traps rain water forming a pool and side strips not nailed securely.

air conditioners not installed on slope to allow drainage of water

concrete ledge over windows (outside) not sloped outward. Water is trapped next to building and water will seep through the walls.

eave strips not painted properly or with number of coats specified. Paint peeling off already.

eave filler blocks not installed under aluminum roofing as per specifications. (NOTE: This item needs to be checked on all buildings at N'Jala also. I didn't specifically check for this at the time of my inspection there.) Also, the roof fascia board did not close up to the aluminum roofing adequately on the ends of the building.