



## S U M M A R Y

### Project Description

The National Cereals Research and Extension Project (631-0013) proposes to develop the institutional capacity of the Institute of Agronomic Research (IRA) to provide high quality research on maize, rice, sorghum, and millet, as well as to develop linkages to facilitate transmission of the research results to the farmer.

The project agreement was signed on August 31, 1979, setting the PACD as June 30, 1985. In June, 1983, PACD was extended until December 31, 1985.

The project is being implemented by the Institute of Agronomic Research, a branch of the General Delegation for Scientific and Technical Research (DGRST) in collaboration with the International Institute of Tropical Agriculture (IITA) of Ibadan, Nigeria.

Nine IITA researchers have been stationed in various climatic zones of Cameroon to initiate research relevant to the farmers of these various zones. Research stations are found at Bambui, Dschang, Maroua, Nkolbisson, Fombot, and Ekona.

### Evaluation

The first evaluation of the project was conducted during September and October, 1983 by two outside consultants, Elvin Frolik, agricultural research expert, formerly Dean, College of Agriculture, University of Nebraska, Lincoln, and George B. Alcorn, agricultural extension expert, formerly Director, Cooperative Extension Service, University of California, Berkeley. Their evaluation report is attached to this summary. The consultants were assisted by the USAID Project Officer, Abdel Moustafa. A review session to discuss the evaluation findings was held in October, 1983. Comments made in this meeting are included in this summary.

### Evaluation Findings

The evaluation team concluded that the NCRE project is an excellent one. The success to date is due to several factors:

- (1) there existed a great need for strengthening research on cereal grains in Cameroon;
- (2) the project is well conceived;
- (3) within funding limitations, the GURC is very supportive of the project;
- (4) USAID is providing substantial funding and considerable leadership;
- (5) IITA has assembled an unusually capable staff to help the Cameroonians conduct research and institution building;

- (6) the production and quality of research conducted to date is excellent; and
- (7) the clientele (Cameroonian farmers and other agriculturalists) are receptive to the research results.

### Potential Problem Areas

The team pointed out some potential problem areas and offered recommendations to address these areas. These areas and recommendations include:

#### 1. Testing and Liaison Units (TLUs)

(1) The evaluators noted that the TLUs have played a limited role to date in strengthening the relationship between research, extension, and farmers, due to the facts that (a) there is heretofore only one TLU in the country; (b) the NCRE program is relatively new and (c) the extension staff as a whole is not trained in agriculture and cannot function in any effective teaching role without some considerable instruction (see page 23-24).

(2) The TLUs must chart their course carefully and be sure that they do not traverse over into the domain of extension, which is under the purview of the Ministry of Agriculture and other parastatals. The TLUs should cooperate with the extension services through the provision of technical information, planting materials, furnishing research persons at training schools for village workers and at other places, and performing other similar functions, but not in conducting extension programs directly (see page 46).

(3) Two additional TLUs should be added, one at Ekona and one at Nkolbisson. There should be only one person staffing each TLU rather than two. This individual should be the "liaison person" between research and extension, "a sort of broker bringing two persons (researcher and farmer user) together but not being a principal". Individuals conducting operational research, or field trials, should be titled researchers, not TLU liaison staff (see page 77).

#### 2. Additional Researchers

IITA and USAID should hire the following additional researchers:

- (1) Cereal Agronomist at Foubot
- (2) Cereal Agronomist at Nkolbisson
- (3) Cereal Agronomist at Maroua

Justification for these additional researchers is found on pages 75-76.

USAID should consider increasing the amount of training funded by the project to assure that counterparts for the above recommended researchers are adequately trained.

During the review session for the Frolik/Alcorn report, Ayuk-Takem, Maize Breeder and Coordinator for the NCRE project asserted that a cereals agronomist with a strong background in soil science is needed at Garoua. In addition, a maize breeder to immediately begin varietal improvement work is required. Dr. Ayuk-Takem also recommended that the proposed maize research agronomist for Foumbot might also work with Dr. Kikafunda-Twine to carry out maize agronomic trials in the highland zone of Cameroon, as well as in Foumbot.

Dr. Ayuk-Takem also recommended that a second agronomist is needed at Nkolbisson so that better coverage is achieved for the three Provinces of Centre, South, and East.

Dr. Ayuk-Takem recommended that where NCRE staff are based some sort of financial assistance should be accorded to those stations by the NCRE Project, since in some cases, these stations share the same facilities with NCRE staff (e.g. vehicle, repairs, fuel, some research supplies, etc.).

In addition, the evaluation report pointed out, and this fact was again stressed by A M Maimo, the Deputy Director of IRA at the evaluation review meeting, that the researchers have been dispersing their efforts too much. The evaluators found that the researchers have been planting experiments in areas too remote from their base. As a consequence, the researchers struggle to properly supervise their experiments and have difficulty being on site for the major steps of their research protocols. This fact speaks strongly for increasing the number of researchers.

It was decided at the evaluation review meeting that the exact number of new researchers to be recommended would emerge from the USAID/IITA/IBRD efforts to design a project supplement, to take place in November, 1983.

### 3. Counterparts

Since the project attempts to build-up IRA's capacity to conduct research, it is critical to assess the number and qualifications of counterparts; currently, there are an inadequate number of qualified counterparts for the researchers (see pages 29-30).

### 4. Long-Term Training

Two participants have returned from the United States, five are currently in the United States, and two are expected to start their graduate training soon.

The evaluators concluded that the long-term training program as planned in the project is inadequate in some respects. The evaluators concluded that all long-term trainees should receive PhDs, so that they will have an adequate salary and status to function effectively in the Cameroonian system. Two additional participants should be trained, in rice agronomy, physiology and entomology (see page 41).

## 5. Measuring Project Impact

The evaluators recommended that certain steps be taken to better measure the project's contribution to increased productivity of maize, rice, sorghum, and millet. They recommend that benchmarks be established and data later collected on Cameroonian IRA staff, their educational levels, supporting personnel, research physical facilities, research accomplishments including varieties released or at least identified, and the extent to which the research accomplishments constituted improvements (see pages 33-37).

## 6. Required Government of Cameroon Commitments

In the short-run, if the NCRE project is to continue its success, the Government of Cameroon will have to assure that:

(1) IRA research centers are better equipped. Buildings and research equipment are sorely lacking and must be improved immediately (see page 48).

(2) IRA must hire more scientists and technicians to be counterparts for the IITA researchers. An effort should be made at a high governmental level to review recruitment practices so that an adequate number can be hired.

(2) Cameroon should establish at the national level a Board which will have the function of approving for production in Cameroon all cereal crop varieties released and/or recommended by the IRA or by any other agency or individual (see page 75).

In the long-term, if the research capacity is to be successfully institutionalized and linked to the small farmer, the Government of Cameroon will have to make certain far-reaching commitments. These include:

(1) Expenditure of more funds to the development of an extension service and mandating improved cooperation between research bodies, parastatals, and the Ministry of Agriculture.

(2) Establishment of a full-scale seed program. This will include seed laws, a seed certification program, and a seed testing laboratory (see pages 46-47).

(3) Improvement of roads and communication facilities and services, to better link the small farmer to improved technologies (see page 46).

(4) A re-assessment of the pricing-marketing system of food crops (see page 47).

(5) A reinforcement of the professional status of research scientists and more assistance for their publication of articles and presentation of papers at professional society meetings (see page 47).

(6) An improvement of the input-distribution system.

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AN EVALUATION  
OF PROJECT 631-0013

NATIONAL CEREALS RESEARCH AND EXTENSION

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THE GOVERNMENT OF THE UNITED REPUBLIC OF CAMEROON

UNITED STATES AGENCY FOR INTERNATIONAL  
DEVELOPMENT

INTERNATIONAL INSTITUTE FOR TROPICAL AGRICULTURE

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YAOUNDE, CAMEROON

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Elvin F. Frolik and George B. Alcorn

October, 1983

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## I. ACKNOWLEDGEMENTS

The Evaluation Team<sup>1/</sup> received excellent cooperation in the course of making the review for the evaluation of USAID Project No. 631-0013, the NCRE, IRA, DGRST. The Cameroonian, USAID, and IITA officials and staff members were all most helpful in providing information, making arrangements for conferences and trips of inspection, and generally in making the assignment productive and pleasant. It is almost unfair to name names because so many helped so much in so many ways. Yet we feel we would be remiss if we did not mention Dr. Abdel M. Moustafa, USAID/Yaounde, Project Officer, and Dr. Emmanuel A. Atayi, Chief of Party, IITA Team, NCRE, IRA, who jointly provided most effective leadership during the course of the review and who so efficiently handled the logistics of the assignment, especially during the approximately three weeks spent in traveling over the country. Credit is also due to Dr. Moustafa for contributing directly to this Report the responses to those sections of the Scope of Work having to do with construction, procurement of equipment including vehicles, and the participant program.

We deeply appreciate the interest that Mr. Ronald D. Levin, Director, USAID Mission, Cameroon, took in the Evaluation, including his presence and helpful suggestions made at the final presentation of the review.

We are indebted to the Director of IRA, Dr. Jacques-Paul Ekebil, for taking time from his busy schedule to provide pertinent information and counsel concerning the Evaluation. His assistance contributed substantially to our assignment.

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<sup>1/</sup> Elvin F. Frolik, Consultant, Agricultural Research Management, USAID (formerly Dean, College of Agriculture, University of Nebraska, Lincoln).

AND

George B. Alcorn, Consultant, Agricultural Extension, USAID (formerly Director, Cooperative Extension Service, University of California, Berkeley).

We appreciate and can never repay the hospitality of so many Cameroonians and USAID and IITA staff members, and oftentimes their wives, in inviting us to luncheons and dinners. We were especially honored to dine at the homes of the Fon of Bamounka; Moslem Judge Akali of Ndop and Klan Chief Lawan Siddiki of Yoldeo.

In summary, we shall never forget Cameroon - the friendly hospitality of its people, the complex variety of environmental conditions accompanied by the never ending beautiful scenery, its great potential agriculturally, its rapid economic progress, and its importance among the nations of West Africa. We sincerely hope that through our assignment we will have contributed something to the welfare of the deserving people of Cameroon.

## II. INTRODUCTION AND TERMS OF REFERENCE

An in-depth review, for the purpose of making an evaluation, was conducted in Cameroon during the period of 27 August through 11 October, 1983, of USAID Project No. 631-0013, the National Cereals Research and Extension Project (NCRE). The project did not get fully underway until early 1982 and is to be in effect through December 1985.

Copies of the basic documents consisting of the Project Paper (A1) <sup>1/</sup> Project Grant Agreement between the United Republic of Cameroon and the United States of America for National Cereals Research and Extension (A2); and the contract for National Cereals Research and Extension between USAID Yaounde, American Embassy, and the Institute of Tropical Agriculture, Nigeria, Ibadan (A3) are in the official files of USAID/Yaounde and were made available to the members of the Evaluation Team.

The Terms of Reference were provided in the "Scope of Work for the Evaluation of the NCRE, 631-0013" (B1). It was agreed early in the review that Elvin F. Frolik, George B. Alcorn and Abdel Moustafa would prepare

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<sup>1/</sup> The letters and numbers in parenthesis correspond to the references listed in Section VIII.

responses to the issues presented (B1) which now appear in this Report. Randal Thompson, utilizing the contents of the above report as well as drawing upon her own observations and those of the other members of the Evaluation Team, prepared the Project Evaluation Summary as required by AID.

In assembling needed information, the Evaluation Team reviewed, in addition to the above, in varying degrees, a series of documents listed in Section VIII. Numerous conferences were held with groups and individuals who are directly involved in IRA, NCRE, or who have at least some interest in the Project. Site visits and conferences outside of Yaounde were made on two major trips over the country, each taking about 10 days. The first included the North West, West, South West and the Littoral Provinces; and the second the Extreme North, North and Adamaoua Provinces.

Specifically what was expected of the Evaluation Team, how the review was to be conducted, and the information to be included in the Report were clarified and in fact to some extent developed in a series of conferences held at various times during the course of the review. In addition to the Evaluation Team these conferences were all attended by Mr. William Litwiller, Dr. Abdel Moustafa and Ms. Randal Thompson. Others joined in from time-to-time.

In addition to the above, on 31 August, Dr. Bernard D. Wilder, Acting Director, USAID/Cameroon, and Mr. Stanley Handleman, Acting Deputy Director, briefed the team on the type of information and recommendations which would be of prime importance to the top administration of the USAID Mission.

Taking into account the instructions provided as outlined above, the background information gained, and in the time available, the members of the team have made the Project Evaluation as presented in this Report.

### 4 III. RESPONSES TO ISSUES IN THE PROJECT PAPER

Determine whether assumptions of Project, and its design logic are still valid, and whether Project activities, as currently undertaken will lead to Project objectives, whether Project objectives should be changed (B1).

The various issues in the Project Paper (A1) and our responses are as follows:

Issue: Develop Cameroonian capability to more adequately cover research and production development of maize and rice (sorghum and millet subsequently added) while developing high yielding disease and insect-resistant varieties of maize and rice and companionable production system for distribution to farm holders, and to develop a small, highly-skilled extension capability to distribute research results to the smallholder.

Response: The choice of the word "companionable" is open to question. A more direct phrasing and what is actually being done is "making studies on maize, sorghum and millet - not rice - in mixed "cropping systems".

The IRA is a research organization. It should provide resource people to help train extension workers but to state as a part of the purpose ".....to develop a small, highly-skilled extension capability... is to overstate IRA's role in extension. It should be borne in mind that extension is the responsibility of the Ministry of Agriculture and of the parastatals and authorities which are closely associated with that Ministry, and not of the DGRST. This is in no way to say that the role of the IRA is not to generate research results and varieties which will be of prime value to and utilized by farmers.

Issue: The purpose of the National Cereals Research and Extension Project (NCRE) is to develop the institutional capacity to provide high quality research on maize, rice, sorghum and millet, as well as to develop efficient linkages to facilitate transmission of the research results to the farmer.

Response: The above statement is acceptable but it should be elaborated by stating that the linkages should be established jointly with those organizations and individuals who have the prime responsibility for supervising and training the extension workers at the village level.

Issue: The objectives of the Project are:

(a) To develop the institutional capacity to provide high quality research on maize, rice, sorghum and millet.

(b) To develop efficient linkages to facilitate transmission of the research results to the farmer.

Response: Cogently stated. We agree fully.

Issue: The researchers design the tests and supervise personnel of the extension services and/or parastatal organizations who, in turn, supervise the farmers executing the tests.

The farmer field trial/demonstrations should also shorten the time required for testing prior to the general release of research results.  
We propose the establishment of TLU to design the methodology of the field tests; coordinate the testing program; study the results, including the socio-economic impact of the proposed recommendations; feed back the results and other problems facing farmers to the researchers for further research and translate the research results into recommendations for extension personnel.

JRA has made sufficient progress on maize research to permit implementation of trials on farmers' fields. The international (rice) research institutions have built up a backlog of results which are ready for testing in Cameroon.

Little research has been done on tropical sorghum and millet, but some has been carried out in Cameroon.

Response: Sentence 1 - We disagree. It is not a proper function of researchers to ".....supervise personnel of the extension services and/or parastatal organizations.....". This is the function of higher ranking

staff within those respective organizations. It is a proper function of the researchers to design demonstration plantings, provide seed and planting plans, provide appropriate counsel, and participate in training schools as needed by the cooperating organizations.

With reference to the last two paragraphs of the above issue, there is sufficient background information and there are varieties available to conduct experimental trials on farmers' fields, either by researchers or by the TLU staff, or both, and actually both are underway. As of 1983, the first section of the last sentence is not correct. There is a great deal of research underway on sorghum and millet in the tropics.

Issue: .....GURC agencies and Ministries implementing agricultural programs coordinate efforts to improve their efficiencies.....

Response: The team found excellent cooperation between NCRE and a number of the parastatals and authorities. NCRE also has good liaison with the IRA Center Chiefs, Provincial Delegates of Agriculture and Projet Semencier.

Issue: .....Small producers must have access to improved technology.....

Response: Agreed.

Issue: .....that adequate human and financial resources will be provided for agricultural research and that other donors provide adequate assistance to other aspects of agricultural research.....

Response: GURC, through IRA, is no doubt doing its best to provide the necessary resources. However, there is an acute shortage of people trained to the Masters and Ph.D. levels in agriculture and, further, there exists a similar shortage of persons trained to the baccalaureate level in agriculture, who would be eligible to undertake graduate training. So, on this point of adequate human resources, the above assumption is not valid.

With regard to financial resources, IRA has lagged somewhat in providing physical facilities for the staff of scientists working on

cereals. This can perhaps be attributed to a lack of the necessary finances.

On the other donors, the Team lacks sufficient information to make a valid judgement. There do appear to be quite a number of donors but, almost without exception, those contacted expressed a strong preference for IRA doing all of the research on cereals, thus enabling them to concentrate their efforts on education and other aspects of agricultural production. (an exception is that SEMRY did not request assistance on rice research)

Issue: The TLU will have at the end of Phase II, an Extension Agronomist, an Economist, a Rural Sociologist, a Chief Training Officer and a Publications Officer. All except the Senior Extension Agronomist should be on board at the end of Phase I.

We assume that:.....the Social Scientists are permitted to participate in designing the methodology for the field tests and will cooperate with the biological scientists.

Response: Inasmuch as the IRA has not had extension responsibilities delegated to it, the term "Extension Agronomist" may not be appropriate. Perhaps "Agronomist or Economist, cooperating with Extension" would be more in order.

"An Economist" is acceptable since there are already two on the IITA staff. The addition of a Rural Sociologist is acceptable only as a replacement for one of the Agricultural Economists, should one of them leave the IITA staff before the Project is phased out. We would place a low priority on the position of a Training Officer. What is needed is solid subject matter to teach - the "arranging" of schools and training sessions can and should be done largely by other agencies.

The position of Publications Officer should be at the IRA level or possibly even higher - it does not belong at the Cereals Division level.

The first portion of the last paragraph should be removed. This type of thinking appears to imply that there needs to, be a "bridge, i.e.

someone else, between plant scientists working in agriculture and farmers. Persons doing applied research (and presently that is the only kind being carried on by NCRE) must, as a part of their job, be close to farmers to assess their needs and to plan experiments which will help to solve those problems. They can often do this best directly, not through someone in another discipline. The best example we saw of direct assistance to a farmer was that of Dr. Dangi, sorghum breeder, conducting a variety test on the farm of Chief of Clan, Lawan Siddiki, at Yoldeo in the Extreme North Province. Chief Lawan had seen some of Dangi's plantings elsewhere and asked for further assistance. Dangi proposed planting a variety test on land which had not been farmed previously. The Chief accepted and provided the necessary land and farming operations, with Dangi supervising the research. When viewed on 21 September, the test looked very good. It constitutes an almost dramatic demonstration of what can be done; i.e., converting bush to first-class farming land in three months time. Chief Siddiki is extremely pleased with the development. With 16 villages being involved, the spread of influence will be substantial.

The assumption that ".....the Social Scientists.....participate in designing the methodology for the field tests....." borders on the ludicrous. We believe they could contribute almost nothing to designs of biological experiments. The assistance of a biostatistician would be much more in order.

We think the best use of social scientists can be made by their working primarily within their own disciplines. Cooperation among all agricultural scientists is highly desirable, but to imply that one should serve as a "crutch" for another is not realistic. As these various scientists maintain close liaison, each can best determine what assistance from the others and what types of cooperation are indicated.

In summary, the basic objective of the Project should be modified slightly to read somewhat as follows: "Strengthen Cameroonian research capabilities to more adequately cover varietal improvement and production

practices of maize, rice, sorghum and millet. Special attention should be given to mixed cropping systems. The highly variable and complex environmental conditions of Cameroon must be recognized. Special problems resulting from multiple cropping and producing moukwari crops have to be dealt with in the research programs. Incorporation of storage and palatability qualities in cereal grains is important along with the more traditional aspects of incorporating insect and disease resistance in new varieties. Finally, capability should be strengthened in the IRA to provide appropriate technical backstopping for extension programs."

Question: Is the Number of Technicians Adequate?

Responses from NCRF staff:

- (1) Bambui: Assuming that Dr. Everett will be at Bambui, and that Dr. Kikafunda-Twine will be able to concentrate on maize agronomic research, no more IITA technicians needed here.
- (2) Dschang: Yes.
- (3) Maroua: No. Need sorghum agronomist to be stationed at Maroua to serve the entire sorghum growing area. Also another sorghum breeder to be stationed at Garoua. Do not want TLU.
- (4) Nkolbisson: No. Need TLU to cover East, South and Central Provinces. Not many parastatals and authorities in this general area so need for extending research results greater than in some other portions of the country.
- (5) Ekona: T.J. Ambe, Agronomist, made a plea for IITA technicians - agreed that TLU would be acceptable. He stated that the area is one of the most promising for maize - two crops can be grown annually - one during the rainy season and the other on swamp land in the dry season. Chung, on the other hand, says that Ekona gets too much rain - 2284mm. annually (C2) - to grow maize for grain. In both 1982 and 1983, vivipary was very serious in Chung's tests. Main use for maize is for eating green.

Responses from Evaluation Team:

- (1) Bambui: Shift Kikafunda-Twine from TLU to full-time maize research. McHugh to handle TLU.
- (2) Maroua: Add one sorghum/millet research agronomist.
- (3) Nkolbisson:
  - (a) Add TLU - one agronomist with extension background and experience in conducting replicated field trials - to work on maize.
  - (b) Add one maize research agronomist.
- (4) Ekona: Add TLU - one agronomist with extension background and experience in conducting replicated field trials - to work on maize.
- (5) Foumbot: Add one maize research agronomist.

Question: Are the Technicians located in the most appropriate agroclimatical zones relative to the need for agronomic research required for increased food production?

Responses: Taking into account where IRA Centers and Stations are located, where the respective crops are adapted, and where the parastatals and authorities are operating, the answer in general is "yes". This applies to both present and proposed staff. The explanation by crops for the above is as follows:

- (1) Maize Breeding. Maize is grown to some extent in all ten Provinces, although it is probably not the best cereal for the northern part of the country where annual rainfall is 800mm. or less. The two maize breeders and their counterparts will cover the principal maize growing areas - Dr. Chung the lowlands (under 800m. elevation) and Dr. Everett the highlands (above 800m. elevation).
- (2) Maize Agronomy
  - (a) Kikafunda-Twine located at Bambui.
  - (b) TLU at Bambui.

- (c) Maize Agronomist to be stationed at Foubot
- (d) TLU at Ekona.
- (e) Maize Agronomist to be stationed at Nkolbisson to cover the East, South and Central Provinces.
- (f) TLU at Nkolbisson.
- (g) Talleyrand stationed at Garoua to cover the Adamaoua, North and Extreme North Provinces, wherever maize is of significant importance.

(3) Sorghum/Millet

(a) Sorghum/millet breeding

Dangi stationed at Maroua will handle these crops. Sorghum grown chiefly in 400mm. to 1000mm. rainfall areas and millet grown chiefly in the 200 to 400mm rainfall isoyets (C1).

- (b) Sorghum/millet agronomist to be stationed at Maroua and will parallel Dangi's geographic area of work.

(4) Rice

(a) Rice Breeding.

Janakiram stationed at Dschang to cover entire nation.

(b) Rice Agronomy

Roy stationed at Dschang, to parallel the work of Janakiram.

Question: What is the relationship and degree of cooperation between NCRE (IITA) staff and IRA permanent staff, with respect to the following:

- (1) Is it adequate?

Response: Yes.

- (2) How does each technician (IITA) fit into the overall personnel structure of IRA stations?

Response: All present and proposed IITA technicians fill and will fill on an ad hoc basis critical needs at the IRA stations.

(3) What are contributions to agricultural research management decisions?

Response: Ayuk-Takem states that IITA staff are included in the making of such decisions.

(4) How are the technicians project management skills?

Response: Appear to be entirely satisfactory.

(5) Are they efficient in planning, organizing, monitoring and administering the project?

Response: In general the technicians are incorporating in their field experiments comparisons which will generate information and improved varieties which will meet vital needs of Cameroonian agriculture.

The experimental designs used (in most cases randomized complete block design) are appropriate, except that in a few cases of agronomic research the split-plot design might have been preferable (see F 5-p.378). The latter design could reduce the danger of human error in conducting the experiments as well as enhancing the precision on the most important comparison being made. The number of replications used is generally appropriate. In some cases the technicians appear to be running too many experiments over too wide an area. There were a few cases of unsatisfactory stands and possible mix-ups where planting and treatments have been delegated to others. Generally, the principal investigator should be present when tests are planted, treatments (such as fertilizers) applied, and at harvest. Depending upon the particular experiment, some additional inspections during the growing season are also desirable. It is recognized that with roads in Cameroon being what they are and communication facilities being inadequate, the above will not be possible 100% but it should be the goal. The proposed additional staff will cut down on the areas to be covered by the maize researchers, which should enable each one to give more personal attention to each of his field experiments.

Question: Has adequate supporting staff (technicians, laborers) been assigned for each program?

Response: A total of 18 technicians are listed (D4) for the NCRE Project of whom four are presently in training. All stations where NCRE work is underway are shown as having one or more technicians and in addition Njombe and Ntui are shown as having one technician each. The situation at the respective stations is as follows:

- (1) Nkolbisson: Has three technicians who should be sent abroad for short-term training.
- (2) Dschang: Reported being short of both technicians and laborers.
- (3) Maroua: Answered this question in the negative.
- (4) Garoua: Talleyrand stated that he has no technicians, although one is listed for Garoua (D4).
- (5) Bambui: No direct response from staff. Seven technicians are listed for this Station (D4).
- (6) Summary: In the "Scope" conferences, this question did not receive a great deal of attention, which would make it appear that it does not constitute a major problem. However, the Evaluation Team recommends that a further check be made in order to obtain a more definitive answer to this question so that corrective action (if any is needed) can be taken.

Question: What is the quality of technical assistance

Response: This question implies degree of motivation, qualifications, and over-all capabilities of IITA staff.

The Evaluators congratulate GURC, DGRST, IRA, USAID and IITA on assembling an outstanding staff. These technicians as a group would measure up well with agricultural research organizations over the world. They are well trained, have good native ability, are highly motivated, conscientious and sincerely interested in helping Cameroon improve its agricultural sector.

Of the nine members of the technical staff, all but one have Ph.D. degrees, one in agricultural economics (Atayi), and the rest

in plant breeding and/or agronomy, including soils. McHugh has a Masters degree in agricultural economics. All of the respective highest degrees were earned at excellent universities (land grant in all cases in the U.S.) in Australia, Canada, India and the United States. The diversity of educational institutions represented adds strength to the team. Most of the IITA staff had prior professional work experience in addition to their strong academic backgrounds.

Every effort should be made to maintain the present high staff standards in future hirings.

Another noteworthy fact is that nine of the ten IITA staff members have lived, gone to school, and/or worked in more than one country prior to coming to Cameroon. Thus they did not have to undergo the "cultural shock" so commonly experienced by expatriates who have previously lived in only one country. All of the nine staff members already on location appear to be comfortable and happy with their surroundings and living conditions - an important factor in expatriates doing good professional work.

Question: What is the educational level and number of IRA staff/researchers associated with and/or assigned to the project?

Response:

IITA Staff Member

Emmanuel A. Atayi, Ph.D

Toby Chamberlain

Jay Chung, Ph.D.

Cameroonian Counterpart

Jacob A. Ayuk-Takem, Ph.D.

Passam Ezechiel, Degree in Law,  
Baccalaureate + additional year

Jean-Bosco Zangue, B.Sc. Scheduled  
to become participant and being  
replaced by Charles Thè, Ph.D.

IITA Staff Member

Cameroonian Counterpart

Animesh C. Roy, Ph.D.

Takow Julius A., M.Sc. (recently returned from studying at Louisiana State University).

D. Janakiram, Ph.D.

Fabien Joutong when he completes M.Sc degree at Louisiana State University in 1984.

Henry Talleyrand, Ph.D.

Ngoumou Nga Titus, B.Sc.

Om P. Dangi, Ph.D.

Partial - Kenga Richard, Ingénieur de Travaux.

J. Kikafunda-Twine, Ph.D.

Ms. Pauline Zekeng, M.Sc.

Dermot McHugh, M.A.

Marc Samatana, Engineer Agronome

Leslie Everett, Ph.D.

Jacob A. Ayuk-Takem, Ph.D.

In addition to the Counterparts, each Station where NCRE staff are located should have entomology and plant pathology staff available, to whom the plant breeders and agronomists could turn when problems in these areas occur which are beyond their capability to handle. Presently the situation in this respect is as follows:

Staff Available

<u>Station</u>	<u>Entomology</u>	<u>Plant Pathology</u>
Nkolbisson	None	None
Dschang	None	Dr. Samuel Nzietcheng, Chief of Station, and Dr. Joseph Tchatchaoua recently returned from ten years residence in Germany.
Naroua	Noffi Ta Ama (works on cowpeas)	None
Garoua	None	None

<u>Station</u>	<u>Entomology</u>	<u>Plant Pathology</u>
Bambui	None	Claude Nankam, B.Sc. (to leave shortly for advanced study in the U.S.A.).

The development of the University Center at Dschang offers some potential for access to staff disciplines needed by NCRE. The plan for ten staff members from the University of Florida to be in residence at Dschang, along with the Cameroonian staff, should make available a variety of talents useful to NCRE staff. In turn, it should also be possible for the University to call on NCRE staff located in that general area to give occasional lectures to students taking courses in their respective disciplines. The services of the University staff might also be utilized in supervising research done in Cameroon but to be used for a dissertation in partial fulfillment of requirements for the Ph.D. degree from an American University. This would be of special interest in the participant program.

Question: Is adequate office and working space provided for each project technician?

Response:

- (1) Emmanuel A. Atayi: Office space adequate.
- (2) Toby Chamberlain: Office space adequate.
- (3) Jay Chung: Shares office with Counterpart -- should have private office. Has no working space.
- (4) Animesh C. Roy: Modest office which Roy considers adequate. Also he considers working space adequate.
- (5) D. Janakiram: Same as (4) above.
- (6) Henri Talleyrand: Has fine office in a house leased by IRA leased since there is presently no IRA station at Garoua.

- (7) Om P. Dangi: Has good, air-conditioned office. States he needs space for technician and also cold room for seed storage.
- (8) Kikafunda-Twine and Dermot McHugh at Bambui: Ms. Zekeng and Mr. Samatana share one office. Need space for secretaries and clerks, a conference/library room, and a laboratory room. Have one small store and need another. The best solution would be a seed house which would encompass: driers; a place to process crop samples brought in from the field; cold storage room for storing seed as well as other storage space; work room for putting up seed and for other uses, a room for storing fertilizers and preferably a separate one for storing pesticides; cubicles for technicians; space for workers to come in when it rains; space to store experimental equipment and small tools; and toilets and wash-up rooms.
- (9) Summary: Each IRA Station where NCRE staff are located should have a seed house as described for Bambui above. This has been recognized by Moustafa. He has plans underway for such construction with USAID funding. However, USAID funds are presently available for construction of only one such seed house (Nkolbisson), for which specifications have already been drawn up.

Question: Is the project in general receiving adequate support from the GURC, DGPST and IRA?

(1) Response of Cameroonian Officials

- (a) GURC: Dr. Wankwe, Joseph Amizobel, Ministry of Planning, represented the GURC on part of the field trip to the West, South West and Littoral Provinces, and on the entire trip to the Extreme North, North and Adamaoua Provinces. He expressed some concern over the manner in which USAID funds are made available to the GURC but appeared to be pleased with the technical aspects of the Project.

- (b) DGRST: Calls were made on the following DGRST officials: Nya Ngatchou, Director of Programs; Paul Nchoji Nkwi, Deputy Director of Programs; and Victor Sunday Balinga, Conseiller Technique. Although the question was not put directly, it appeared that these officials are pleased with the NCRE project and are generally supportive.
- (c) IRA: A number of conferences were held with Dr. Jacques-Paul Ekebil, Director and Maino Mapri Anthony, Deputy Director of the IRA. Both expressed satisfaction with NCRE, except that the Director made a plea for more integration of the USAID/IITA and the IRA programs.
- (2) Response of Evaluation Team: The GURC, through the DGRST and IRA appears to be giving both financial and moral support to the NCRE to the extent that Cameroonian resources permit. The chief constraint is the lack of qualified Cameroon Nationals to fill the counterpart line positions - and only time can take care of this. Dr. Moustafa working closely with the appropriate GURC officials is proceeding as rapidly as possible to send worthy Cameroonians (participants) to the United States to earn baccalaureate, masters, and Ph.D. degrees (as the case may be).

The need for greater integration was emphasised by Ekebil and Baboule, and mentioned by Ayuk-Takem and others. The problem appears to be sufficiently serious in the minds of these Camerconian officials that it should not be ignored, i.e. left with the hope that it will "go away". To some extent the coming "on track" of fully qualified Cameroonians in the counterpart positions so that an end to the presence of IITA advisors is in sight, will help to alleviate situation. Meanwhile, the IITA staff should encourage their Cameroonian counterparts to assume as much responsibility as their capabilities will permit and give them all credit due whenever and wherever possible. The number one priority should be on institutional building and only secondly on carrying out programs, important as the later are.

Finally, there needs to be a clear understanding between IRA and USAID on just what needs to be done, and what can and what cannot be done. Baboule asked for complete control of all funding, regardless of source. U.S. laws and AID policies and regulations must of course be taken into consideration in any allocation of funds. A full understanding can only be reached by the appropriate IRA and USAID officials sitting down together, putting all cards on the table and arriving at the best possible solution. All personnel involved in the NCRE should then be advised on the agreed course and requested to abide by same.

Questions: Is any equipment needed to facilitate project progress?

Response: This question can best be answered by stating that generally the lack of equipment constitutes the single largest constraint in progress being made by the NCRE. There is little research equipment available to NCRE personnel. The situation by locations is as follows:

Nkolbisson: Maize breeder needs a seed drier. Chung wants hand planters. Charles Thè thinks that the maize breeders should have a tractor-operated maize planter. In view of tests being conducted over a wide geographic area, the Evaluation Team believes that a supply of hand planters would be the best solution at this time.

There should also be a number of moisture testers procured to assure having at least one in working order when a test is being harvested.

Dschang, Mbó Plain, and UNVDA: The rice team has little in the way of research field laboratory equipment available.

The soils and plant pathology laboratories at Dschang are very inadequately equipped, for example, two pressure cookers substitute for autoclaves. Roy is a well-trained soil scientist. Better use could be made of his capabilities if he were provided with at least

minimum equipment for soil testing. There is a well equipped soils laboratory at Ekona operated by well qualified staff, but the staff is over-taxed. The two IRA plant pathologists, although not counterparts, could contribute substantially more to the rice research program if they had a suitably equipped plant pathology laboratory.

At the Santchou Antenna on the Mbo Plain, the equipment consists of a hand-operated thresher (a step above manual beating) and a hand-propelled cleaner (fan and shaker) - both old and outmoded.

Research field equipment is on order from IRRI (IRA funds). Requested but not funded are a soil and plant analyzer, along with other laboratory equipment. IRA has funds to equip the plant pathology laboratory.

Maroua: Dangi does his seed processing at the Guiring Station. He has no seed processing equipment. Sorghum and millet are threshed by hand-beating and winnowing in the wind. There is no electricity at Guiring. A seedboro thresher is on order.

Crop processing facilities will be developed at the Moda Farm, a 600 hectare tract in the Maroua vicinity.

Garoua: Talleyrand has virtually no field or laboratory equipment.

Bambui: Have a modern fairly well equipped plant pathology laboratory. Otherwise there is a general lack of research field and laboratory equipment. With the concentration of NCRE staff (both IRA and IITA) at this Station, appropriate field and laboratory equipment should be procured as rapidly as possible. A seed drier and cold storage facilities for storing seed constitute prime needs.

Bambui should have top priority after Nkolbisson for one of the seed houses being planned by Moustafa/USAID.

Special note: One of the "hang-ups" in procuring equipment may be the possible delays in clearing Cameroonian customs. A delay of

two years in one case was reported to the Evaluation Team.

Question: What has been done so far in the area of research on each crop?

Response: All of the results of experimental work conducted in 1982, and tests underway in 1983 are well and thoroughly documented (D-4) (D-5) (E-7) and (E-9). It would be redundant to repeat the information here. The experimental results present are impressive with regard to both extent and quality.

Question: Are the interpretation of results and conclusions drawn realistic?

Response: The IITA staff have shown the level of significance at the 5% level and the C.V. (E7) for most of the experiments reported for 1982. Dangi even reported the level of significance at the 1% level for one experiment. Further, for most of the maize agronomic experiments the d.f., M.S., and F values are reported.

For the TLU data, the levels of significance at the 5% level where shown for a limited number of tests. A number of line graphs were presented where there were only two variables, for which Y and R<sup>2</sup> values were reported.

The above statistical analyses make for careful and cautious interpretations of experimental data. In the reporting there probably could and should be more emphasis placed on the danger of placing too much emphasis on too few years' results.

Question: How will the research results benefit project beneficiaries, the Cameroonian farmers?

Response: The use of research results should benefit the Cameroonian farmers via higher yields and/or qualities, lower per unit costs and more farm income.

Question: How are the results being extended to farmers?

Response: Since NCRE conducts considerable research in cooperation with parastatals, there already exists a close linkage between research and the farmer - and therefore research results are immediately available to their farmer clientele. The same may be said of the tribal units and Credit Unions with whom NCRE works in a limited way.

NCRE attempts in a small way to reach farmers not associated with parastatals, tribal units or credit unions via the TLU (the TLU's outreach activity is noted elsewhere in this Report.

While there is a lack of adequate publications the TLU is contemplating some radio activity. The placing of demonstrations and trials in strategic places (lead farmers) can also be done so that "spread of influence" can be maximized.

Question: Are research techniques being transferred to Cameroonian staff such that research can be continued after technicians leave?

Response: The Team members saw no basic evidence to the contrary. Attention is called to the response on page 15, which shows the names of Counterparts working with each IITA staff member, respectively. Briefly, four of the IITA staff positions are matched with staff of adequate experience and academic background to continue the research involved in a satisfactory manner after the IITA technicians leave; five are matched with Counterparts where attainment of higher academic degrees would be desirable; and one IITA staff member has a counterpart on only a part time basis, and this counterpart needs more academic training.

To the extent that Counterparts are available and have sufficient academic training, the transfer appears to be progressing satisfactorily; in fact, the same can be said in those situation where the Cameroonian Nationals presently lack adequate academic training to ultimately occupy

senior staff positions. If arrangements are made to provide the necessary additional academic training, if those persons are reassigned to their present positions after earning higher degrees, and if, meanwhile, the expatriates are retained in their present assignments long enough for all of the above to take place, the net result should be an unusually well qualified staff of Cameroonians carrying on cereal crop research.

A very encouraging note on filling staff positions with qualified Cameroonians is the participant program. Persons are being sent to earn academic degrees in the U.S. as rapidly as worthy candidates can be identified. The fact that candidates are carefully screened before being accepted is commendable - a person lacking necessary native ability, sincere interest, and/or motivation is a poor investment as far as further academic training is concerned.

In summary, the answer to the question is a "conditional" yes. It will take a considerable period of time before enough Cameroonian Nationals attain the level of academic training and necessary experience in research to fill all positions labeled as "Counterpart". However, there is no question but that, given adequate time and retaining expatriates until an orderly transfer is possible (position by position) the Cameroonians can continue the research without interruption -- their more recently acquired academic training should even give them some advantage over their expatriate Counterparts.

Question: What role has the TLU played in strengthening the relationship between research, extension and clients?

Response: On the positive side one can recite the following: (a) the TLU works closely with the IRA and in some instances there is no differentiation made between the TLU and the other components of IRA; (b) the TLU has worked effectively with MIDENO, including the ULG consultants from England who are

assisting in setting up Extension Training Schools. The ULG consultants state that in the future MIDENO will look to the TLUs as subject matter specialists; (c) the extension agents who have participated in the TLU school at Bambili College are most enthusiastic about the course; (d) the NCRE program involves a number of parastatals and tribes, so that NCRE researchers are linked closely with the decision makers in the parastatals and the tribal units (all extension is targeted at the decision makers who are not in all cases the farmers themselves).

On the other hand in the larger frame of reference of Cameroonian agriculture it must be admitted that to date the TLU has only played a limited role in strengthening the relationship between research, extension and farmers (clients). This can be attributed to the following: (a) there is only one TLU in NCRE in the entire country; (b) the NCRE program is relatively new; (c) the extension staff as a whole is not trained in agriculture and can't function in any effective teaching role without some considerable instruction.

Question: How have the socio-economic surveys, training of farm demonstrators, and testing elite varieties in the farmers' fields contributed to narrowing the gap between researchers and farmers?

Response: This question especially the use of the word "gap" implies that the researchers in the NCRE are not in close contact with farmers and their problems. This not true. NCRE staff at present are doing only adaptive research. They are in no sense of the word involved in basic research such as molecular biology or genetic engineering. Their work takes them over the country. They are in contact with "delivery systems" of agricultural research and have experimental plots directly on parastatals, tribal and traditional farmer fields.

The direct answer to the question is 'not to a great extent' because: (1) the program is relatively new; (2) so far research has not proceeded far enough to make important recommendations re: elite varieties and (3) farm demonstrators still lack sufficient subject matter ability and/or confidence and are restricted by lack of transport, inputs and effective ways of contacting large numbers of farmers.

No reading was obtained on the effectiveness of socio-economic surveys in this respect, but "an Agro-Socio Economic Survey of Farmers in the North West Province of Cameroon" (G2) published in 1983 by the TLU is of interest to the biological researchers and should be of some assistance to them. The survey does contain pertinent information even though in the words of the authors, answers to the questionnaire leave much to be desired. A second survey is currently underway.

Question: What is the relationship between TLU and the overall organizational structure of the Extension Service in Cameroon?

Response: The relationship of the TLU to the overall organizational structure of the Extension Service in Cameroon has been largely limited to the North West and South West Provinces, where contacts were initiated at the Provincial Delegate levels. Three schools or courses by the TLU have been held in which TLU first contacted the Provincial Delegate of the Ministry of Agriculture who in turn contacted the Divisional Delegates and they perhaps in turn the Sub-directors of Agriculture. The Provincial Delegates selected the participants and invited them to attend. The first such course was conducted in the North West Province. Success of this course led to the holding of the second school in the North West Province for which ten participants were chosen by the Provincial Delegate from from each of his five Divisions. The third school, following the same protocol from the Provincial Delegate downward, was held in the South

West Province.

Another relationship has to do with field demonstrations. Village agents follow TLU's instructions and were provided with mini-kits to put out farm plot demonstrations (the demand for mini-kits exceeded the supply). The demonstration plantings are not replicated. Some concern might be raised that NCRE employees of IRA are supervising the staff of another Ministry i.e., the Extension agents of the Ministry of Agriculture. However, really this activity is just an extension of the training schools already approved by the Ministry of Agriculture -- and further the feed-back from the farm demonstrations should be of value to the researchers.

Replicated trials run entirely by TLUs on parastatals, tribal lands and traditional farms constitute research and therefore are not in conflict with extension of the Ministry of Agriculture.

Demonstrations, however, put out on farms by the TLUs without the involvement of Extension agents could be viewed as usurping the functions of the Extension agents. Such programs are strictly extension -- not research -- and therefore not a proper function for the TLU. TLU means "Testing Liaison Unit". The implication is clear.

Everyone including extension administrators seem to agree that the extension organization should serve as a linkage between research and farmer users of information. However, only six of the fifty participants at the second North West TLU school had ever visited IRA. One major reason given was that research and extension are in different Ministries within the Government. They are recruited with minimum grade school education and placed in rural areas. There they not only lack sufficient knowledge of agricultural subject matter but they also suffer from lack of transport, inputs, farmer organizations through which to operate, and lack of contact or linkage with the research units. Consequently they are confined to walking distances from their villages and devote the major part of their time to non-teaching

activities, i.e. making surveys, gathering statistics, arranging events, etc.

We had the opportunity of meeting with eleven extension agents at the Bambili Regional College of Agriculture Training School being conducted by MIDENO. The training courses in progress had to do with food crop production, extension methods, and the making of socio-economic surveys. These participants were obviously being greatly stimulated by the course.

When asked what were the main problems of doing extension teaching in their respective areas, their answers were first the lack of an organization of farmers through which to work and thereby enhance their spread of influence, secondly the lack of transport, and third availability of "inputs". Some thought should be given to the first concern because the "one on one" method of teaching is too slow and expensive to be effective. An established farmers organization through which to teach was a prerequisite in many American states to the positioning of local extension agents. Some of the Cameroonian agents mentioned that they seek to make contacts by attending market days -- but this 'one on one' spread of influence is too slow, which they recognize. Their companion concern was "how to win acceptance". This obviously can only come and be maintained by knowing the subject matter and being in close linkage and contact with research in order to be up-to-date.

The relationship between the TLU and the Extension Service should be greatly enhanced by the TLU activities because (a) the training of the Extension staff cannot be objected to by the Extension Service. They are getting their staff trained and as a matter of fact they cooperate fully in the endeavor and (b) the reciprocal arrangement in assisting by the Extension staff in socio-economic agricultural surveys -- a feed-back to the researchers resulting in more pertinent research results in an arrangement that is mutually beneficial to both NCRE (TLU) and the Extension Organization.

The relationship between the TLUs and the Extension Service will be enhanced because: (a) extension is getting their staff better trained by the subject matter specialists of the NCRE; (b) the TLU is getting assistance of the village workers in conducting socio-economic surveys.

Question: What is the relationship between the TLU and Cameroonian food crop production parastatal organizations, e.g. SEMRY, SODECOTON, WESTCORN, etc.?

Response: The TLU works with parastatals, e.g. MIDENO, WADA, SEMRY, SODERIM, and UNVDA, and credit unions in putting out replicated field trials. The TLU will incorporate its training into MIDENO's program in the North West Province. The Evaluators were also told that the TLUs will work with SODECAO in the South, SODECOTON in the north, SEMRY in the East and UCCAO in the West, and hopefully still others, in the future. Westcorn, the Evaluators were told is at present inactive.

Question: Is one TLU sufficient? If not, how many additional units are needed and where?

Response: The World Bank suggests three more TLUs one each at Fombot, Nkolbisson, and Maroua or Garoua. The Evaluation Team recommends two more TLUs, one at Ekona and one at Nkolbisson.

We would recommend that no TLU be considered for northern Cameroon for the following reasons:

- (a) Dr. Boli Babouli, Chief of the IRA Center at Maroua, stated that he is not interested in having a TLU.
- (b) Since 1974 at the request of GURC, SODECOTON has undertaken to give advice and assistance for food crop production in the whole of northern Cameroon, with the exception of the SEMRY rice and the Mandara mountain areas. SEMRY provides food crop advice to farmers. The Mandara mountain area is obviously under the influence and decision making of one tribe.

(c) Starting with the 1983 season the IRA Director has programmed SAFGRAD/Cameroon to engage in pre-extension trials in farmer fields (L1).

(d) In all the north the Extension organization has 232 agents who are not well trained at all and are encumbered with other jobs and lack of facilities and transport. SODECOTON has approximately 1000 agents in the field who (1) provide inputs (seeds, fertilizer, credit); (2) technical information from research to farmers and help them apply "inputs" and (3) market crops for farmers. SODECOTON is closely linked with both farmers and researchers. Thus it was decided early on in the NCRE program not to station or contemplate a TLU in the north.

(e) The introduction of a TLU in the north could lead to a competitive situation with other existing agencies.

A question arises as to whether Foubot or Ekona would be the better place to station a TLU. The Evaluators opted for Ekona which has a well equipped and operating soils laboratory, and is a research center. A TLU at Nkolbisson station with all the resources there, headquarters for IRA and three of its Centers, and servicing Eastern, Southern and Central Provinces, has in our own view considerable merit.

Question: Is the USAID/IITA Project leading to a Cameroonian-staff institutional capacity working on maize, rice, sorghum and millet research?

Response:

Maize: Situation favorable with respect to breeding. Dr. Jacob Ayuk-Takem is a capable maize breeder of long standing. We recommend that Dr. Everett be stationed at Bambui, where the two researchers can complement each other.

This arrangement would be in accordance with Dr. Ayuk-Takem's wishes.

Dr. Chung's incoming Counterpart, Dr. Charles Thè, has recently completed his Ph.D. degree at North Dakota State University. He should "mature" rapidly into a senior scientist under Dr. Chung's tutelage.

Dr. Talleyrand has a highly motivated and capable counterpart in Nga Ngoumou Titus. However, Titus has only a baccalaureat degree, and hence it will be five years at best before he completes his Ph.D. degree. Thus, expatriate help will be needed here for perhaps another seven or eight years.

Assuming that Pauline Zekeng also shifts to maize agronomy research, she will continue to be the Counterpart for Dr. Kikafunda-Twine. She has her Masters degree but should get a Ph.D. Thus it would be perhaps another five years before she could take over from Dr. Kikafunda-Twine.

Sorghum and Millet:

Breeding: Dr. Dangi has only a "partial" Counterpart with a baccalaureate degree. So rather slow progress is being made here towards a Cameroonian National replacing Dr. Dangi.

Agronomist (proposed): No identifiable Counterpart.

Rice: Counterpart for Dr. Roy just starting; and Counterpart for Dr. Janakiram is still in training in the U.S., subject to being assigned here.

TLU: (assuming Evaluation Team recommendation for one person in each TLU is accepted)

At Bambui, Mr. Dermot McHugh has as a Counterpart, Mr. Marc Samatana, Socio-Economist. It is not known what is planned for further graduate study for Mr. Samatana. At Nkolbisson and at Ekona, no identifiable Counterparts for proposed TLU expatriates.

Question: Is the USAID/IITA Project leading to research programs for maize, rice, millet and sorghum, including demonstrations on farmers' fields?

Response: (a) For research programs on maize, rice, millet and sorghum, the answer is definitely "yes". This is well documented in (C1) (D4) (D5) (E7) and (E9); (b) For demonstrations on farmers' fields: The TLU has been quite active in setting up demonstrations on farmers' fields. In 1982, the TLU set out 13 on-farm rice and maize demonstration/trials. In their 1983 Work Plan somewhat fewer demonstration/trials are called for. However, with the courses they have been conducting for Extension agents, including training them to set out on-farm demonstrations, an unknown but larger number were no doubt set out.

Question: Will activities of the TLU result in transmitting agronomic information to Extension agencies as well as transmitting farmer concerns to researchers?

Response: Aside from the comments made previously which set forth the positive results of the TLU programs and the accompanying constraints and difficulties, there is only the question of whether institutional and/or political rigidities will hamper the TLU's progress.

The Project recognizes the lack of linkages between research and extension which are due in part to the fact that agricultural research activities and extension functions are segregated within two distinct and vertically structured institutions (the DGRST under which IRA operates and the Ministry of Agriculture). The TLU is an attempt to bridge that gap with the TLU doing "operational research" on farmer field testing, conducting demonstrations, training extension agents, making socio agro-economic surveys, and transmitting information from researcher to farmer and vice versa.

Question: Are present activities leading to an exchange of information with international, African and Cameroonian institutions conducting agronomic and socio-economic research?

Response: Lists of all of the above three types of institutions with which NCRE is collaborating are available (D4, page 31), and (D5 pages 8 and 9). Lists in the two reports are not synonymous and both should be referred to in order to get the complete story. The number of institutions with which NCRE is cooperating is indeed impressive.

Depending on the crop in question, periodic visits to inspect and help evaluate entries in field trials in Cameroon are made by scientists from IITA, IRRI, ICRISAT, CIMMYT, and SAFGRAD. Data obtained from NCRE are summarized regionally with those from other countries. The regional reports are then made available to all of the cooperators as well as to others.

In addition to tests at IRA-Stations and their respective antennas, Dr. Chung had tests in 1983 on lands of the following: CENEEMA, MIDEVIV, Njombe Center, Ekona Center, Sanguere Projet Semencier, Mayo Galke SODECOTON, Farmer Fossett, Nkven MIDENO, Wassande SODEBLE, SODECUTON, and Farmer Ngaoundere. Maize agronomic tests were also conducted on a number of the above.

The rice investigators, in addition to tests at IRA Stations and antennas, have trials in 1983 on lands of the following: MIDEVIV; SODERIM; UNVDA, Ndop Plan, Bambui; Agrilagdo Project-Karewa Experimental Farm; Baigom Rice Farm; and a farmer's field near Tingoh.

Sorghum and/or millet trials in 1983 are being conducted on lands of the following (in addition to IRA Station and antennas): Agri-Logdo, Kerawa; SEMRY, farmer field near Maroua (Striga); and Clan Chief Lawan Siddiki, Yoldeo, B.P. 111, Maroua.

TLU provided seed for tests and/or demonstrations on farms through MIDENO; UCCAO; WADA; SFPC Credit Unions; the Community Development Training Center in Kumba; farms of Nyan Ndi, John Ntum at Tingo, Denacios Nyoo at Tingoh and Ojong Jacob at Osayo Obang; and at the Government Technical College Tongo.

The above list of organizations and individual farmers on whose lands experiments and demonstrations are being conducted speaks for itself, in showing the close collaboration between

NCRE staff and other organizations and farmers. Not all of the above Cameroonian organizations conduct research but some do and all are obviously much interested in research results generated by NCRE. In turn, NCRE staff benefit a great deal from their contacts with the other organizations and individual farmers.

Question: Are present activities leading to adequate physical facilities and equipment for carrying out cereals research programs?

Response: The current situation and needs for space and equipment are given in previous sections. The situation and needs can be summarized by stating that overall there is a need for more office space, more working space, for seed houses and for research equipment -- both field and laboratory.

Plans are underway for construction of some seed houses. USAID, through Dr. Moustafa, is moving as rapidly as possible in the procurement of equipment, as detailed in a subsequent Section of this Report.

In summary, the answer to the question is a conditional "yes". Progress is being made but whether the physical facilities will ultimately be "adequate" cannot be answered at this time.

Question: How can the Project's contribution to increased productivity of maize, rice, sorghum and millet in Cameroon be better measured?

Response: The initial provision for measuring inputs and outputs are given in the Logical Frame Matrix included in the Project Paper (A1). With the added experience gained in pursuing the Project which is now well into its second year, additional guidance can be suggested, as follows:

First of all, using available yields and production statistics for Cameroon to measure possible increases down the line is not recommended for the following reasons: (1) Since there are numerous other programs underway to increase yields, how does one assess the

amount of the increase that can be attributed to NCRE? and (2) the accuracy of the available statistics on crop yields and production is subject to considerable question. It is noted that a program is getting underway to conduct a census in the country with assistance from USAID/USDA. This program will no doubt generate more accurate data than are now available, but may come too late to establish the needed initial benchmarks. Also, it is not known whether or how often the census will be conducted in future years, an important consideration if it were to be used as a measure of change.

In view of the above limitations, the following steps are suggested to measure progress and improvement:

(1) Make a complete inventory of the IRA Cereals Programme to establish benchmarks, the source to be the record of the Director's office and of each IRA Station and respective antennas. The situation at the time Project 631-0013 was launched will be determined by the following:

- (a) Names of staff, educational levels of each, discipline and crops worked on.
- (b) Names and educational level of technicians and their respective areas of work.
- (c) Number of secretary/typists.
- (d) Availability of laborers.
- (e) Physical facilities:
  - 1. Land - number of hectares.
  - 2. Irrigation facilities, if any.
  - 3. Office space and equipment.
  - 4. Laboratory space and equipment.
  - 5. Stores, crop processing facilities and storage space.
  - 6. Field (farming) equipment.
  - 7. Research field equipment.

- (f) As complete a list of varieties as possible which had been released or at least identified and recommended for planting in Cameroon or some portion thereof by IRA (an initial attempt to do this has been made by Dr. Atayi - see appendix v). To the extent that seed stocks of such varieties are still available, they should be evaluated by including them in field trials.
- (g) A compendium of research data, interpretations, conclusions and recommendations derived therefrom, as found in annual reports, technical publications, popular bulletins and leaflets, and other possible sources. Any recommendations being made to farmers at the time of launching of Project 631-0013 should be tested through field trials by the respective crop agronomist.
- (h) It is to be noted that experimental work and extension or extension-type activities on cereal crops had been, and, in fact, are still underway by various other agencies, often supported, at least in part, by other donors. An indepth inventory and analysis of these other programs would be very time-consuming and perhaps not worthwhile. However, the names of these organizations together with a list of their personnel doing research on cereal crops, and a summary of their programs and accomplishments at time of "launching" would be useful.

(2) NCRE to make a survey for the four crops being worked on, to establish the "state of the art" on farms at time of "launching" as follows:

- (a) Where parastatals produce the crops directly or control the source of seed and chemicals applied, get from them the following information (by crops):
  1. Hectarage planted with each variety.
  2. Type and amount of fertilizer applied.
  3. Type and amount of pesticides (including herbicides) applied.
  4. Cultural practices including such factors as land preparation, rate, method and time of planting, hand weeding, etc.

- (b) Where farming is not done by a parastatal directly or under parastatal control, obtain the same information as in (a) above through a farm survey, using appropriate design to do the sampling. NCRE is fortunate in having a staff member of Dr. Atayi's capability in designing and carrying out farm surveys. He should also be given the leadership responsibility for extracting the appropriate data from the parastatals.
- (c) It has been found that prior to the time of commercialization of agriculture, farmers (1) may not know what varieties they are growing, (2) may think they know but be wrong on identifying their varieties, or (3) have seed stocks with such a high degree of mixtures and/or so much outcrossing that variety name has little or no meaning. To the extent that this is true, a survey based on the farmers' responses may not contribute a great deal.

An alternative to getting the information from farmers orally, is the so-called "drill box survey". The term is not applicable in Cameroon because there are few drills, but the principle is. In this type of study, the "surveyors" go to the individual farms at time of planting and take a sample of seed. All of the samples are then assembled and planted at a station or at some other suitable location in single row plots. Also included in the planting are known seed sources of the varieties which farmers think they are planting, along with other recommended varieties. At the appropriate time or times for each crop respectively, "experts" identify (as best they can) each farmer's sample with respect to variety and mixtures present. Through properly-designed sampling methods, this system will provide fairly accurate data on which varieties are being grown, and to what extent the varieties being grown are "diluted" or conceivably "enriched" by mixtures. Incidentally, such plantings lend themselves very well to holding of extension field meetings -- a farmer likes to see "his" variety in comparison with those of other farmers and to get an accurate identification of same along with degree of mixtures present. Typically, the program results in the farmer obtaining new seed stocks if need for same is indicated.

In summary, if the above suggested procedures are carried out there will be available dependable benchmarks as the situation existed at the time of launching of Project 631-0013, covering Cameroonian IRA staff, their educational levels, supporting personnel, research physical facilities, research accomplishments including varieties released or at least identified, and the extent to which the research accomplishments constituted improvement. Secondly, the "state of the art" as being carried out through parastatals as well as by "traditional" farmers will be ascertained through contacting the parastatals and through on-farm surveys, including "drill-box" samplings and plantings. The degree of progress made can then be determined at any time desired by applying the corresponding measurements, i.e. obtaining analagous data.

The above does not constitute an insurmountable task. To the extent necessary, the above program can be substituted in part for the types of surveys conducted by NCRE in the past (G2).

A valid criticism of the above suggested program to measure progress is that it is already somewhat late -- the benchmarks should have been established at the time of or prior to the time Project 631-0013 was activated. Nothing can be done about that now and any further delay will only add to the problem. It is believed that reasonably accurate initial benchmarks can be established at even this somewhat late date. Further, there would appear to be no good alternative to measuring progress and assessing outputs as customarily called for by AID in the Log Frame, and as emphasized by Acting Director, Bernard D. Wilder, in a briefing session held on 31 August 1983.

Question: Do present progress and results justify an increase in project inputs during the life of the present Phase?

Response: (1) Background: The evaluators are deeply impressed with the conceptual planning, the quality and motivation of both

the IITA and the Cameroonian segment of IRA, the methodology employed to carry out the Project, and the quality and extent of accomplishments, in the relatively short time that the Project has been underway. As indicated earlier there is also a good receptiveness on the part of Cameroonian farmers and other agriculturists for research information and improved varieties

A word of caution may be in order. The demand for research results and improved varieties on the one hand, and the enthusiasm of the researchers on the other could conceivably result in recommendations being made and accepted prior to an adequate number of years testing for verification. The same holds for release or identification of varieties to be recommended. Should recommendations be made on the basis of inadequate testing, the farmer might suffer losses through reduced yields, with concomitant repercussions on the NCRE staff specifically, and on the IRA and USAID in general. However, considering the maturity and good judgement of the IITA and Cameroonian staff members of NCRE, such premature recommendations are really not anticipated.

(2) Conclusion and Recommendation: In view of the above very strong showing under Project 631-0013 to date and in order to expedite goals under the 5-Year Plan of the GURC, the Evaluation Team recommends that much of the proposed increase in program as outlined above, be activated during the life of the present phase. Specific priorities have not been established. However, attention should be given first to procurement of equipment and building construction in order to maximize the production of the present staff, and secondly on adding more staff. This general priority is suggested even though it is recognized that there is a pressing need for additional staff, and that they could substantially and rapidly enhance both the research

and training components of the project, GURC/USAID should move as rapidly as possible to increase cereal production in Cameroon. Such in investment of funds on the part of both GURC and the Government of the United States appears to be fully justified.

Question: When should the next evaluation take place and what type of evaluation should it be?

Response: We suggest that the next evaluation take place at or near the end of Phase I, and that it be conducted similarly to the present one.

Question: Should the future evaluation(s) include project design experts to start designing Phase II of the Project?

Response: We feel, definitely, yes.

Question: What is the status of the long term training?

Response: USAID is responsible for administering the long term training program. According to the Project Paper, AID will finance participants for M.Sc and Ph.D. degrees, nine to the M.Sc. degrees and three Ph.D.

A. Presently there are five participants in the United States as follows:

<u>PARTICIPANT</u>	<u>DEGREE</u>	<u>DISCIPLINE</u>	<u>UNIVERSITY</u>	<u>DATE OF Departure</u>	<u>DATE OF Return</u>
1. Fabien Jeutong	M.Sc.	Rice Agronomy	Louisiana State	March 82	Dec. 84
2. Edward Ngong-Nassah	M.Sc.	Cereals Agro- nomy & Exten.	South Dakota State	April 81	May 84
3. Christie Ngundam	B.Sc.	" " "	Univ. of Missouri	Dec. 80	Dec. 83

<u>PARTICIPANT</u>	<u>DEGREE</u>	<u>DISCIPLINE</u>	<u>UNIVERSITY</u>	<u>DATE OF DEPARTURE</u>	<u>DATE OF RETURN</u>
4. Bernard Soneh	B.Sc.	Cereals Agronomy	California State University Fresno	June 82	Dec. 84
5. Cletus Asanga <sup>1/</sup>	a. B.Sc.	" "	Oklahoma State	Dec. 81	July 83
	b. M.Sc.	Grain Storage Entomology	Kansas State	Aug. 83	Dec. 84

B. Two participants have returned this summer after completing their graduate programs as follows:

<u>PARTICIPANT</u>	<u>DEGREE</u>	<u>MAJOR</u>	<u>UNIVERSITY</u>	<u>DATE OF DEPARTURE</u>	<u>DATE OF RETURN</u>
1. Charles Thè	Ph.D.	Maize Breeding	South Dakota	Oct. 81	July 85
2. Julius Takow	(a) B.Sc.	Rice Agronomy/	Louisiana State	Jan. 80	-
	(b) M.Sc.	Rice Breeding	" "	-	Aug. 83

C. Two participants are expected to start their graduate training shortly as follows:

<u>PARTICIPANT</u>	<u>DEGREE</u>	<u>MAJOR</u>	<u>UNIVERSITY</u>	<u>DATE OF DEPARTURE</u>	<u>DATE OF RETURN</u>
1. Jean Zangue	M.Sc.	Agronomy	University of Minn or Univ. of Missouri	-	-
2. Claude Nankam	M.Sc.	Plant Pathology	(To be determined)	-	-

Both returned participants, Mr. Takow and Dr. Thè have been as counterparts for Drs. Janakiram and Chung, respectively.

D. The following observations have been noted during the evaluation:

- a. The number of participants and level of education they are receiving contribute to IRA's institutional strength.
- b. Delay of sending participants to the United States has slowed the rate of project progress.

<sup>1/</sup> Participant succeeded in obtaining B.Sc. in 20 months. IRA and USAID allowed the participant to utilize the remaining fund to get his M.Sc.

c. IRA is highly committed to sending additional candidates for training as soon as qualified Cameroonians become available.

d. Participants presently in the United States are not pre-assigned to project researchers (IITA). The assignments are made only after their return to Cameroon.

e. Inadequate overlapping will occur between the trained IRA participants, and project technicians during the Phase I of the project.

f. The training program as outlined in the Project Paper is inadequate: e.g. two to Ph.D. level, nine to M.Sc. level and three to B.Sc. level. Senior IRA staff and evaluators strongly believe that every IITA researcher should eventually be replaced by Cameroonians holding the Ph.D. degree. It was stated frequently that Cameroonians with degrees less than Ph.D. do not receive adequate salary to keep them interested in their jobs nor have enough status to get full IRA support. Hence, returned participants with B.Sc. or M.Sc. degrees should be sent back to the United States for further training, after working for the IRA for at least one year and proving to IRA administration that they are good and dedicated researchers.

g. IRA staff and project technicians highly recommend, and evaluators concur, that two Cameroonians, in addition to the Counterpart positions listed should be trained as follows:

1. One participant to the Ph.D. level in the area of rice agronomy/physiology to work closely with the rice agronomist and breeder. This is essential since rice production in Cameroon faces several physiological constraints with respect to cold and photoperiods.
2. The second Cameroonian should be trained in the area of entomology to the Ph.D. level, since IRA does not have an entomologist.

Question: What is the status of the short term training?

Response: Four participants employed by the Upper Noun Valley Development Authority (UNVDA) have received training in IITA. Moreover, six IRA employees have received training at IITA and the International Rice Research Institute (IRRI). At least ten additional Cameroonians will receive short term training in international agricultural research Centers.

Question: What is the situation with respect to construction?

Response: In Project Implementation Letter (PIL) dated August 28, 1980, Mission reserved \$144,000 from the Project grant for construction of several facilities as follows: (a) IRA-Bambui: Enlargement of an office, laboratory building and warehouse and construction of field shed; (b) IRA-Njombe: construction of field shed and warehouse; (c) IRA-Yaounde: construction of field shed; (d) IRA-Maroua: renovation of a house

Project records indicate that construction at IRA Bambui and Maroua have been completed at the cost of \$61,000.

Evaluation of IRA facilities indicated that the Institute does not have acceptable facilities for storage, warehousing, or field laboratory working areas in Yaounde, Bambui, Dschang (IRA-Mbo), Maroua and Garoua. Funds were not allocated when the project was designed to finance the badly needed five uniform laboratory-warehouse buildings. It has been determined that each such unit would cost \$100,000 to \$125,000. The USAID-IITA Contract is being modified so that \$125,000 can be used to construct one unit in Yaounde. Also, the unused funds from PIL No. 1 (\$83,000), will be utilized to erect a second unit in Bambui. There is a consensus that warehouses/laboratories are most needed at the above mentioned locations. Funds for construction of three additional units in Maroua, Garoua and

Dschang, respectively, should be allocated during the design of the Phase II of the project.

B. Residential houses: In USAID PIL No. 2, dated June 18, 1981, Mission reserved \$540,000 for construction of three houses at IRA-Yaounde, two houses at IRA-Dschang, and one house at IRA-Bamenda.

a. Bamenda: The construction was completed this summer and the house is occupied by Dr. Kikafunda-Twine. IRA has also provided a house for Mr. McHugh.

b. Dschang: Construction came to a halt when banks refused to extend additional credit to the contractor. The Governor's office in Dschang is in the process of procuring the services of another construction firm. When construction is completed, one of the two houses will be occupied by Dr. Roy who is presently residing in a rented house. IRA-Dschang has already provided a house for Dr. Janakiram.

c. IRA-Yaounde Construction of the three houses is progressing at a very slow rate. Drs. Atayi and Chung, and Mr. Chamberlain now reside in rented houses. They will move to the new IRA houses, once they are constructed. Dr. Talleyrand, IRA-Garoua, will continue to occupy a rented house, and Dr. Everett, who will probably be assigned to IRA Bambui, will have to rent a house in Bamenda.

Question: What is the situation with respect to commodities?

Response: Vehicles located in areas other than northern Cameroon are very difficult to maintain and deteriorate very rapidly. A total of \$75,000 was allocated in the newly revised budget of the USAID/IITA Contract to purchase five 4-wheel drive sedan vehicles. The Rice Breeder and Rice Agronomist stated that travel from Dschang to Ndop and Mbo plains in the pickup and carryall is very exhausting. They would prefer to use passenger cars when roads permit. Number of vehicles procured, their locations and condition, and assignees are summarized in the following table:

Registration No.	Make-Model	Purchased by	Base Location	Assigned To	Observations
1. IT 11704	Chevy-Blazer	USAID	Nkolbisson	Chamberlain	Present condition: fair.
2. Unregistered	Chevy-Blazer	USAID	Nkolbisson	-----	Received in poor condition and was never put on the road. It is currently being "cannibalized"
3. IT 11705	Chevy-Blazer	USAID	Douala	Staff	Normally kept in Douala for staff business in town. Present condition: good.
4. IT11652	Chevy-Pickup	USAID	Dschang	Roy	Present condition: fair.
5. IT11697	Chevy-Pickup	USAID	Bambui	TLU	Present condition: fair
6. IT 11715	Chevy Blazer	USAID	Bambui	-----	Not presently functioning due to extreme body deterioration.
7. IT 11710	Chevy-Blazer	USAID	Maroua	Dang	Present condition: good
8. IT 11697	Chevy-Pickup	USAID	Garoua	Talleyrand	Present condition: good
9. CS 258 AS	AMC-Cherokee	NCRE	Dschang	Janakiram	Present condition: good.
10. CS 259 AS	AMC-Cherokee	NCRE	Nkolbisson	Chung	Present condition: good.
11. CS 323 AT	AMC-Cherokee	USAID	Nkolbisson	Atayi	Present condition: good.
12. CS 326 AT	AMC-Cherokee	USAID	-----	-----	Currently in Nkolbisson. To be assigned to new staffperson expected shortly. Condition: poor (recurring engine problems).
13. IT 15057	AMC-Cherokee	USAID	Bambui	TLU	Present condition: excellent.
14. IT 15058	AMC-Cherokee	USAID	Bambui	TLU	Present condition: excellent.

## DISCUSSION

The NCRE is conducting an excellent program, doing credit to DGRST, IRA, USAID, and the IITA. The unusual success to date appears to be due to several factors as follows: (1) there existed a great need for strengthening research on cereal grains in Cameroon; (2) overall, the project was well conceived; (3) within funding limitations, the GURC is very supportive of the project; (4) USAID is providing substantial funding and considerable leadership as well; (5) IITA has assembled an unusually capable staff to help the Cameroonians conduct research and in institutional building therewith, and (6) lastly, the clientele (Cameroonian farmers and other agriculturists) are receptive, to the research results.

The production of the NCRE staff to date is striking (C1,C4,D4,E1,E7, E9, and G2,), both with respect to extent of experimental data reported and research underway. The quality of research is excellent. The problems selected to be worked on and the methodology employed in conducting field experiments demonstrate high native ability, good academic training, and mature judgement on the part of the NCRE, IRA staff. The programs of the TLU, with extension aspects have been well conducted and equally well received.

Officials of various parastatals and authorities stated that they are conducting limited experimental trials on cereal grains only because to date they have not had available sufficient good solid experimental data and improved varieties from any other source. Generally, they expressed a desire to discontinue their present research on food crops if IRA will assume the full responsibility for same (SEMRY is an exception in that the officials expressed no desire for IRA taking over their rice research).

The challenge to IRA, NCRE, is crystal clear -- provide the necessary staff along with physical facilities and operating budgets to do the indicated research. And time is of the essence -- the clientele want the results as rapidly as they can be generated. The continued role of USAID in strengthening the research programs is a very important one.

The receptiveness of the clientele for research results is good but it also contains some potential risk. The risk involved is that on the basis of inconclusive data (commonly resulting from an insufficient number of years' testing) farmers might adopt agronomic practices or plant new varieties which would conceivably result in lowered rather than increased yields. Should this occur, NCRE might be blamed. The only defense against too early farmer -- adoption is continuous and adequate counsel, cautioning against drawing conclusions from too limited data.

The TLU must chart their course carefully since this constitutes the "E" part (Extension) of the NCRE. They must proceed carefully since IRA is a research organization, and Extension is the responsibility of the Ministry of Agriculture. We see the role of TLUs as cooperating with Extension through providing technical information, planting materials, furnishing resource persons at training schools for village workers and at other places, and performing other similar functions, but not in conducting Extension programs directly.

The Evaluators have not attempted to get into the problem of how many stations and antennas there should be, nor where they should be located. The "Terms of Reference" did not call for such an analysis. Rather we have made our recommendations within the framework of Stations and antennas as they now exist, and as plans have been made to strengthen those already in existence and to add others.

The importance of institutional building has been presented elsewhere. It cannot be overemphasized. Also, as pointed out elsewhere, the problem of "integration" should receive early attention and be resolved. The problem is important and any difficulties that could arise therefrom must not be allowed to interfere with the progress of the excellent program underway.

A good infrastructure is essential to the successful utilization of the results of agricultural research. Much improvement is needed in Cameroon in roads, and in communication facilities and services.

The ultimate success of any plant breeding program is closely tied to a full-scale seed program. In the latter respect Cameroon has a long ways to go. It is our understanding that the country has no seed law, no seed certification

program, and little in the way of a seed testing laboratory. The Foundation Seed Program being conducted by MIDEVIV presently lacks adequate facilities for processing. It is hoped that Phase II of the USAID Seed Multiplication Project will result in rapid improvement in the general area of seeds. Ultimately, there will need to be facilities and appropriate programs to make available good seed of all improved varieties.

Although marketing is not the responsibility of NCRE, it seems in order to call attention of some of the current problems. For example, the officials of UNVDA expressed concern over the fact that they still have 15% of the 1982 rice crop on hand. Those at SEMRY 2 stated rather emphatically that the GURC will have to raise the import duty on rice because imported rice can be laid down in Cameroon at lower prices than SEMRY's cost of production. SEMRY expects to produce 70,000 tons of rice in 1984 vis-a-vis an estimated annual consumption in Cameroon of 90,000 tons.

Mr. Martin Kouebo, Director, pointed out that SODEBLE has 25,000 tons of 1982 maize in storage, which represents about one-third of their annual production. Harvest of the 1983 crop will start in November. It was also reported to us, but not confirmed, that traditional farmers in the highlands of western Cameroon commonly have to accept low prices for maize which is surplus to their own needs. This results at least in part from the fact that they are forced to sell soon after harvest because they lack storage facilities.

Although the prime function of both Cameroonian and expatriate scientists attached to the NCRE is conducting of applied research and making the results therefrom available to the clientele in an appropriate manner, the professional welfare of these scientists should not be overlooked. Only in this way will good staff be recruited and retained.

The scientists should be permitted -- in fact encouraged -- to use some fraction of their time (the amount being agreed upon in advance) to the type of research, the results of which will lead to publication in scientific journals. Also provisions should be made to allow time and travel money for the scientists to present papers based on their research accomplishments at professional society meetings.

In summary, the NCRE is an excellent example of an outstanding program where foreign assistance is involved. It has made remarkable progress. There are problems involved -- non insurmountable -- which should be resolved -- some now and others as the Project moves along.

## VI. SUMMARY

The purpose of the National Cereals Research and Extension Project No. 631-0013, is to more adequately cover research and production development of maize, rice, sorghum and millet in Cameroon while building institutional research capacity on these four cereals and to develop efficient linkages to facilitate transmission of the research results to farmers.

The Project was designed to utilize fully the resources and germplasm of the international research centers (IRA, ICRISAT, etc.), national programs, especially those in nearby countries, as well as from local and other sources; to produce and identify varieties which are superior under the local agro-ecological conditions (which are many) in Cameroon; and to develop suitable agronomic practices including mixed and multiple cropping regimens. The findings are further tested under field conditions of farmer management by Testing Liaison Unit (TLUs). Also the TLUs as the name implies are responsible for liaison with other organizations to assist the latter in bringing research results to farmers.

USAID contracted with IITA to be the executing agency. The project did not get fully underway until early 1982, so it has been in operation for less than two years.

It is recommended that providing adequate facilities and equipment for present staff, both expatriate and Cameroonian, be given top priority, with expansion of the number of expatriate staff coming second.

The Evaluators found the IITA expatriate staff of cereal breeders, agronomists and administrators to be most outstanding and performing

excellently in cases under less than ideal conditions.

The caliber of the Cameroonian Counterparts who will as time goes on replace all of the IITA staff is likewise very good. An excellent participant program is underway, which will provide the academic training as needed for the complement of the Cameroonian staff.

With respect to staffing, the Evaluators recommend a total of three TLU, each one consisting of only one individual -- the present unit to remain at Bambui, with the two additional ones to be located at Ekona and Nkolbisson, respectively. It is suggested that Dr. Kikafunda-Twine remain at Bambui and be assigned full-time duties as maize research agronomist, and that Dr. Leslie Everett, corn breeder, be stationed at Bambui. Additional maize research agronomists would be located at Foubot and Nkolbisson, respectively, and a sorghum/millet research agronomist would be stationed at Maroua. It will be noted that in addition to the present staff of ten, the above plan calls for an additional five scientists.

The TLU staff members must proceed carefully in their programs to provide the necessary liaison and yet not usurp the role of Extension.

Although not part of the function of NCRE, the importance of a good seed program, the desirability of enabling staff, both Cameroonian and expatriate, to make professional progress, and the importance of a sound infrastructure, are emphasized.

Finally it is recommended that the next evaluation take place late in 1985, i.e. at the completion of Phase I, and that the evaluation be conducted similarly to the present one except that a project design expert should be included on the Team.

ARD:	Agriculture and Rural Development (USAID)
CENEEMA:	Centre National d'Etudes et d'Expérimentation du Machinisme Agricole
CIAT:	International Center for Tropical Agriculture
CICP:	Consortium for Integrated Crop Protection (Berkeley, California, U.S.A.)
CIMMYT:	International Maize and Wheat Improvement Center
CRSP:	Collaborative Research Support Program
DGRST:	Délégation Générale à la Recherche Scientifique et Technique
FAO:	Food and Agricultural Organization
ICRISAT:	International Crops Research Institute for the Semi-Arid Tropics
IITA:	International Institute of Tropical Agriculture
IRA:	Institut de la Recherche Agronomique
IRAT:	Institut de Recherches Agronomiques Tropicales
IRRI:	International Rice Research Institute
MIDENO:	Mission de Développement du Nord Ouest
MINAGRI:	Ministry of Agriculture
MIDEVIV:	Mission de Développement des Cultures Vivrières
MSVAT:	Multiple Sorghum Variety Adaptation Trial
NCRE:	National Cereals Research and Extension Project
SAFGRAD:	Semi-Arid Food Grain Research and Development
SEMRY:	Société d'Expansion et Modernisation de Riziculture à Yagoua
SFPC:	Small Farmer Production Credit
SODEBLE:	Société de Développement du Coton
SODECAO:	Société de Développement du Cacao
SODERIM:	Société pour le Développement de la Riziculture de la Plaine de Mbo
TLU:	Testing and Liaison Unit
UCCAO:	Union Centrale des Coopératives Agricoles de l'Ouest
UNVDA:	Upper Noun Valley Development Authority
USAID:	United States Agency for International Development
WADA:	Wun Area Development Authority
WARDA:	West African Rice Development Association
ZAPI:	Zone d'Action Prioritaires Intégrés de l'Est

## VIII REFERENCES

### A. Documents and Agreements

1. Project Paper 631-0013 NCRE. USAID Cameroon, May 11, 1979
2. Project Grant Agreement between the United Republic of Cameroon and the United States of America for National Cereals Research and Extension, AID Project Number: 631-0013. August 31, 1979
3. Agency for International Development Negotiated Contract No. 631-0013-C-00-1004 - Contract for NCRE. 631-0013. January 13, 1981. USAID Yaounde. American Embassy B.P. 817 Yaounde, Cameroon

### B. Scope of Work and PES

1. Scope of work for the evaluation of the NCRE, 631-0013, 1983 USAID/GURC.
2. Instructions for completing form AID 1530-15 and 15A, Project Evaluation Summary (PES) - Part I & II. AID/Washington

### C. IRA - Structure and Programs

1. Ayuk-Taken, J.A. Some highlights about the Cereals Program of the IRA.
2. The Ekona Research Center. March, 1983 DGRST, IRA.
3. MIDENO. Adaptive Research Programme.
4. Programmes de Recherches. 1983-1984. DGRST, IRA. Republique Unie du Cameroun.
5. Summary of research structures and staffing pattern of the Institute for Agronomic Research as of 1980.

### D. Briefing Papers for Evaluation Team

1. Evaluation procedures. (single typed sheet).
2. Design and evaluation of AID assisted projects. November 1980. Training and Development Division, Office of Personnel Management. AID/Washington.
3. Africa Bureau Agricultural Research Strategy. April 4, 1983. Africa Bureau, Office of Technical Resources, Agriculture and Rural Development Division. AID/Washington.

4. NCRE September 3, 1983. DGRST, IRA, United Republic of Cameroon, DGRST IRA, USAID, IITA.
5. NCRE of the IRA, IRA-IITA-USAID. June, 1983. DGRST, IRA, United Republic of Cameroon.
6. USAID/Cameroon. Office of Agricultural and Rural Development, United Republic of Cameroon. July 17, 1982. USAID.
7. Executive summary - AID priorities for research in agriculture January 10, 1983. Draft. USAID/Washington.

E. Progress Reports and Work Plans

1. USAID Cameroon. Summary of USAID Present Contribution to Agricultural Research in Cameroon. USAID Cameroon. Yaounde, Cameroon
2. HART, Thomas G. NCRE Project 631-0013 Project Work Plan 1981-1985 March 31, 1982. National Cereals Research and Extension Project United Republic of Cameroon. Yaounde, Cameroon.
3. HART, Thomas G. NCRE Project 631-0013 Project Quarterly Progress Report for the period 1 April - 30 June 1982. National Cereals Research and Extension Project, United Republic of Cameroon. Yaounde, Cameroon
4. HART, Thomas G. NCRE Project 631-0013 Quarterly Progress Report. 31 December 1982.
5. ATAYI, E.A. NCRE Project 631-0013 Quarterly Progress Report. 31 March 1983.
6. ATAYI, E.A. NCRE Project 631-0013 USAID/IITA/IRA - Cameroon. Quarterly Progress Report. 30 June 1983.
7. National Cereals Research and Extension Project NCRE Annual Report 1982. USAID/International Institute of Tropical Agriculture. IITA. Revised August 1983.
8. NCRE 1981-1985. USAID/IITA.
9. NCRE 1985. USAID/IITA.

F. DGRST

1. Organization Charts for DGRST and IRA.

G. Research Publications of IRA-NCRE

1. Summary information sheet for the IRA Bambui Station. IRA Bambui, Box 80 Bamenda, NW Province, U.R. Cameroon.
2. An agro-socio-economic survey of farmers in the NW Province of Cameroon. 1983. TLU, NCRE, IRA, USAID, IITA.

H. World Bank

1. Report of the Cameroon National Agricultural Research Project Preparation Mission. February 2, 1983. Food and Agricultural Organization of the United Nations, Rome.
2. Aide-Memoire-Cameroon National Agricultural Research Project Appraisal Mission April/May, 1983; May 12, 1983.

I. Miscellaneous

1. Le Projet Westcorn. 1978-1982.
2. Evaluation of small farmer livestock and development project 631-0015, June, 1983. USAID/Cameroon.
3. Ngong-Nassah, Edward N. March, 1982. Communication skills for development professionals. Paper submitted to the Dept. of Rural Sociology, South Dakota State University, Brookings.
4. \_\_\_\_\_ . November, 1982. Some reflections on two agricultural Extension Services, in Cameroon - Middle Africa, and in South Dakota - USA. Submitted to the Dept. of Adult and Higher Education, South Dakota State University, Brookings.
5. Steel, Robert G., and James H. Forrie. 1980. Principles and procedures of statistics - a biometrical approach. McGraw-Hill Book Company. N.Y., N.Y., USA.

J. Itinerary and Program

1. Moustafa, Abdel M. Tentative Program and Itinerary of USAID Evaluation Team. August 29, 1983. USAID Cameroon.

K. Programs of other Organizations

1. Gwathmey, C.O. and M.T. Febasso. Sept. 1983. 1983 SAFGRAD pre-Extension trials in Cameroon: Context, design, materials, and implementation.

IX. APPENDIXES

Appendix i: The Provinces and Capital Cities of the United Republic of Cameroon

October, 1983

<u>PROVINCE</u>	<u>CAPITAL CITIES</u>
1. Centre	Yaounde
2. South	Ebolowa
3. East	Bertoua
4. West	Bafoussan
5. Littoral	Douala
6. South West	Buea
7. North West	Bamenda
8. Extreme North	Maroua
9. North	Garoua
10. Adamaoua	Ngaoundere

Appendix ii

I.R.A. CENTERS, STATIONS AND SUB-STATIONS

PROVINCE	CENTER	CROP / SECTION	STATION	SUB-STATION ANTENNE
CENTRAL	NKOLBISSON	PERENNIAL AND FOOD CROPS	- NKOLBISSON (C) 750m (2) 1587mm(3) - NKOEMVONE (S) - BAROMBI-KANG (SW) 2360m.n - FOUMBOT (W) 1000m 1750mm	- ABONG-MBANG (E) - BERTOUA (E) 620m 1564mm - SANTA (NW)
	NKOLBISSON	FORESTRY	- NKOLBISSON (C)	- BELABO (E) - MSALMAYO (C) - MAROUA
	NKOLBISSON	SOILS		
LITTORAL	NYOMBE	FOOD AND FRUIT CROPS	- NYOMBE (LT) 40m, 2634mm - DSCHANG (W) 1375m 2300mm - BAMBUI (NW) 1420m 2630mm	- EKONA (SW) - FOUMBOT (W) 1000m, 1719m - BAGANGTE (W) - SANTCHOU (W) 720m, 1800m - BASUNGO 1170m - UPPER FARM 1982m
EXTREME NORTH	MAROUA	FOOD AND TEXTILE CROPS	- MAROUA - DJARENGOL - MAROUA - GUIRING	- MAKEBI, MAGA - GOLOMPOUI, BERE - SOUCOUNDOU, SANGUERIE - TCHATIBALI, TOUBORO - FIGNOLE, GULLALE - NDOCK
SOUTH WEST	EKONA	- SOILS  - FOOD, PERENNIAL AND TEXTILE CROPS	- EKONA 460m , 2130mm  - DIBAMBA 5767mm	- LYSOKA 2065mm - NIETE - MONDI

(2) Capital letters in parenthesis refer to Provinces

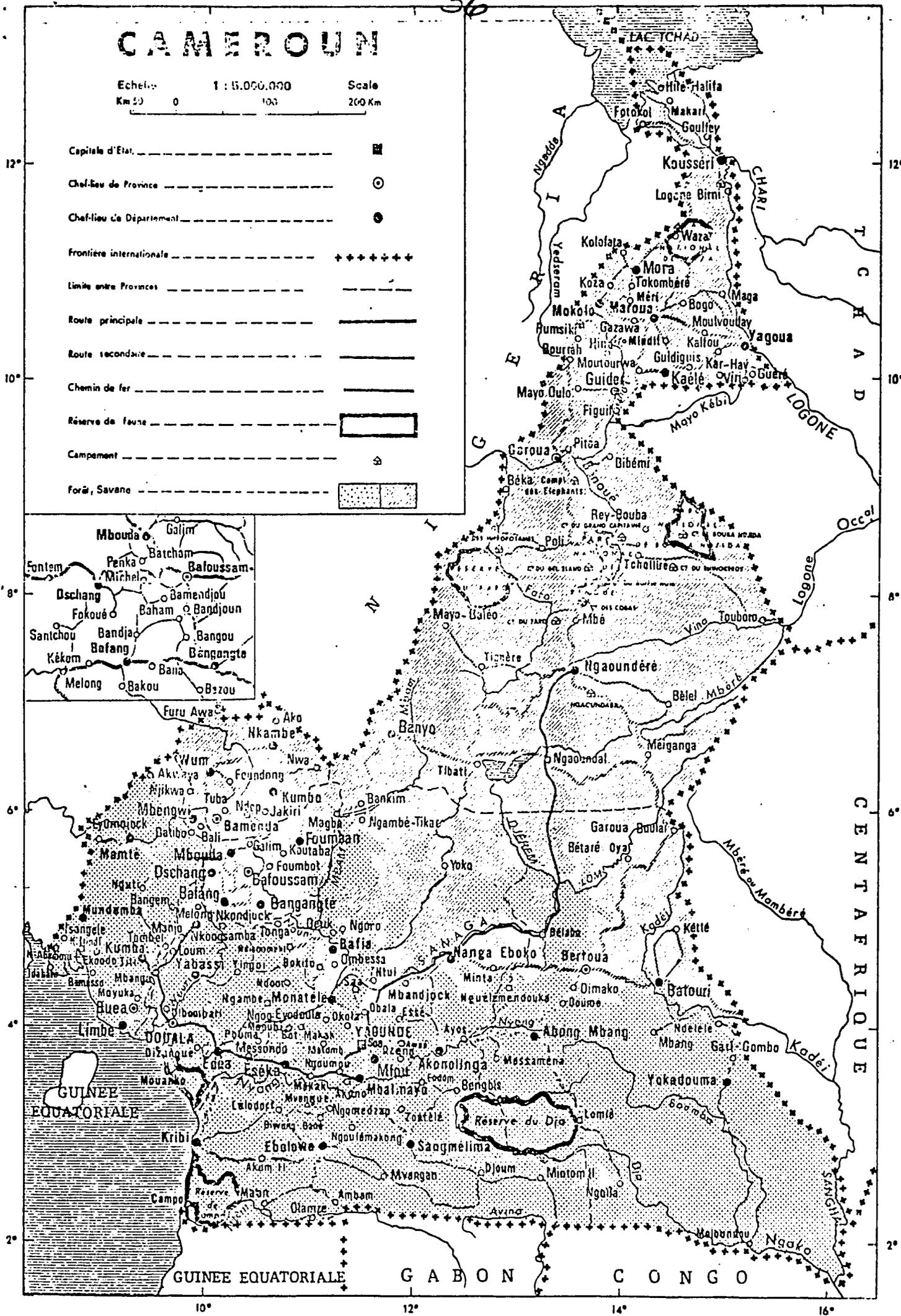
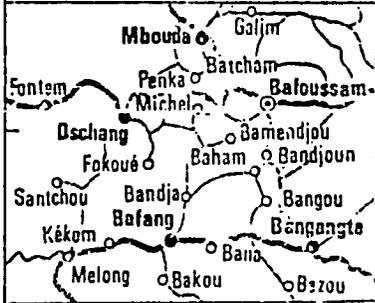
(3) mm indicates annual rainfall in millimeters.

m indicates elevation in meters.

# CAMEROUN

Echelle 1 : 15.000.000 Scale  
 Km 0 100 200 Km

- Capitale d'Etat. ----- ■
- Chef-lieu de Province ----- ○
- Chef-lieu de Département ----- ●
- Frontière internationale ----- + + + + +
- Limite entre Provinces ----- - - - - -
- Route principale ----- ————
- Route secondaire ----- - - - - -
- Chemin de fer ----- ————
- Réserve de faune ----- [ ]
- Campement ----- △
- Forêt, Savane ----- [ ]



Appendix iv: Conferences and Sites Visited<sup>1/</sup>

Saturday, 27 August 1985

Conference

Abdel M. Moustafa  
Leslie Everett, Corn breeder, IITA  
Emmanuel Ayikoe Atayi, IITA, Chief of Party

Monday, 29 August

Conference on Assignment

William Litwiller, Chief of ARD Division, USAID

Conference on Evaluation

Randal Thompson, Project Evaluation Officer, USAID  
William Litwiller  
Abdel M. Moustafa  
Emmanuel Ayikoe Atayi

Tuesday, 30 August

Conference at IRA Headquarters, Nkolbisson

Maimo Mapri Anthony, Deputy Director, IRA  
Abdel M. Moustafa  
Emmanuel Ayikoe Atayi

Wednesday, 31 August

Bernard D. Wilder, Acting Director, USAID/Cameroon  
Stanley Handleman, Acting Deputy Director, USAID/Cameroon  
Abdel Moustafa

Conference on Report Preparation

Randal Thompson  
Abdel Moustafa  
Emmanuel Atayi

<sup>1/</sup> George B. Alcorn and Elvin F. Frolik participated in all conferences and site visits listed. Titles for persons are given only for the first time that a name appears.

Calls on DGRST Officials (with Moustafa)

J. Nya Ngatchou, Director of Programs

Paul Nchoji Nkwi, Deputy Director of Programs

Victor Sunday Balinga, Conseiller Technique

Friday, 2 September

Conference on Report Preparation

Randal Thompson

Emmanuel Atayi

Abdel Moustafa

Tuesday, 6 September

Bambui Station, Staff Conferences

Dr. Jacob A. Ayuk-Takem, Chief of Station, National  
Coordinator of Cereals Program

Dr. Foncho Peter, Plant Physiologist

Dermot McHugh, IITA, TLU

Dr. J. Kikafunda-Twine, IITA, TLU

Ms. Pauline Zekeng, TLU (Counterpart to  
Kikafunda-Twine)

Dr. Jay Chung, IITA, Nkolbisson Station, Maize  
Breeder

Visit to MIDENO (no plot visits -- raining)

Mr. Andrew Ndonyi, Deputy Project Manager

John Parkinson, ULG Consultants Ltd., Extension  
and Training Advisor

I.C. Walton, ULG Consultants Ltd., Agronomist

Bambui Station Field Plot Inspection

Jacob A. Ayuk-Takem and staff.

Wednesday, 7 September

Conference at Credit Union Project, Bamenda

Ken Kerkhoff, Management Advisor  
Alfred Foneng, Agric. League Manager  
Joseph Bote, Agric Officer  
M.M. Fusindamukong, League President

Conference at Wum Agricultural Development  
Authority (WADA)

Frank Rauch, Agronomist

Site visit to MIDENO Center, Mbengwi

Claude T. Kamsu, Chief of Center  
Tambo Muluh, Assistant Chief of Center and Trial  
Supervisor  
Cletus Fombo, Extension Supervisor  
Mrs. Juliet Forgwen 1/, Extension Supervisor

Visit MIDENO Training Center at Bambili, Regional  
College of Agriculture

Eleven Extension Agents (Trainees)

Conference on Responding to Scope of Work

Dr. Jacob A. Ayuk-Takem  
Dr. Jay Chung  
Dr. J. Kikafunda-Twine  
Mr. Santatana Marc, Socio-Economist  
Mr. Dermot McHugh  
Ms. Paul Zekeng

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1/ Not present

Thursday, 8 September

Conference and inspection of NCRE Rice Plots,  
UNVDA at Ndop

Dr. Jacob A. Ayuk-Takem

Dr. D. Janakiram, IITA, Rice Breeder

Dr. Animesh C. Roy, IITA Rice Agronomist

Niba Gregory Nkoh, Director General, UNVDA

Wanki Samuel Bawe, Chief of Production and Research,  
UNVDA

Bambui Station Staff

Randal Thompson

Visit to NCRE Maize Plots at Babungo IRA Substation

Femie Titus, in charge of Substation

Two Farmer Cooperators

Visit to the Fon of Bamounda, Ndop, North West Province

Visit to Alkali (Akady), Moslem Judge, Ndop

Friday, 9 September

Call on Thomas Tata Fojoung, Provincial Delegate of  
Agriculture for North West, Bamenda

Visit Corn plots and Conference at Station de Foubot  
at Bafoussam.

Dr. Ernest Monthé, Director of Station

Site Visit to Farm and Conference with Dr. George  
Muna (Manager Westcom) and Private Entrepreneur

Saturday, 10 September

Dschang Station (IRA) Staff Report Slide Presentation

Mr. Samuel Nzietcheng, Chief of Station

Dr. Joseph Tchatchoua, Plant Pathologist

Dr. D. Janakiram, IITA Rice Breeder

Dr. Animesh C. Roy, IITA, Rice Agronomist

Mr. Joseph Wankwe, Ministry of Plan & Industry

Dschang Station Field Plot Visit - Rice Research

Conference on evaluation on Dschang Station at  
Climatique Hotel, Dschang

Evaluation Team  
Dschang Station Staff

Sunday, 11 September

Inspection of Dschang Station Laboratories

Visit to University Center Dschang and Informal  
Visit with Cameroonian University of Florida  
Staff at Joseph Busby Home

Dr. Robert Marston, President, University of Florida

Dr. Ken Tefertiller, Vice President for Agriculture,  
University of Florida

Dr. William L. Pritchett, University Center of Dschang  
and University of Florida

Dr. Daniel O. Spinks, University Center of Dschang and  
University of Florida

Dr. Bernard Wilder, USAID

Mr. Stanley Handleman, USAID

Mr. Rene Owona, President, University Center, Dschang

Monday, 12 September

Sanchou Antenna - Site Visit and Inspection of Rice  
Research Plots (Mbo Plain)

Dr. D. Janakiram

Dr. Animesh C. Roy

Dr. Joseph Tchatchaoua

Visit to SODERIM Rice Mill (near Sanchou)

Hanein Moogo Laurent

Monsieur E. Foula

Visit to Niombe Center, including Trip over Field Area

Michel Foyet, Chief of Center

Tuesday, 13 September

Conference and Laboratory Visits, Ekona Station at Buea

Mr. J.I. Nuisetja, Acting Chief of Center  
Dr. G.N. Symje<sup>1/</sup>, Chief of Center  
Mr. Jerome Tumentah Ambe, Agronomist  
Dr. T. Tsuizi, Benchmark Soils Project, University of  
Hawaii (short term)

Thursday, 15 September

Conference at IRA Headquarters, Nkolbisson

Dr. J.P. Ekebil, Director General, IRA  
Mr. Maimo Mapri Anthony, Deputy Director, IRA  
Abdel M. Moustafa

Friday, 16 September

Conference in Mr. Litwiller's Office re:World Bank  
Proposal for Agricultural Assistance in Cameroon

Mr. William Litwiller  
Jean-Claude Balcet, Bank Mondiale, Washington, D.C.  
Abdel M. Moustafa

Saturday, 17 September

Conference on Seed, Yaounde

Gary W. Bittner, Project Officer, North Cameroon  
Seed Multiplication Project.

Monday, 19 September

Conference on World Bank Suggestions for 3 Additional  
TLUs

Mr. William Litwiller  
Mr. Larry Dominessy, Deputy Chief, ARD Division  
Mr. Abdel M. Moustafa  
Ms. Randal Thompson

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1/ Not present

Monday, 19 September (cont.)

Briefing Summary Presented by Evaluators to IITA and  
QUINQUENNIAL REVIEW TEAM, Yaounde

<u>Name</u>	<u>Title</u>	<u>Home Country</u>
Dr. Louiz - CROUCH	Management Officer	Dominican Republic
Dr. James M. TERRI	Cassava Breeder	Tanzania
Dr. Patricia ROBERTS PICHETTE	TAC Secretariat	Canada - presently stationed in Rome
Dr. W. COFFMAN	Rice Breeder	Cornell University
Dr. Edgard Normanha	Cassava Breeder	Brazil

IITA QUINQUENNIAL TEAM

Dr. Eugene R. TERRY	Director International Programs	Sierra Leone
Dr. KAUNG ZAN	IRRI Liaison Researcher	Burma

Tuesday, 20 September at Maroua

Visited USAID Officer and Maintenance Garage  
in Maroua

Conferred with William C. Slocum, Agent de  
Liaison, USAID Cameroun, and Mr. McKay  
incharge of maintenance garage.

Conference with Sani Tonge Elie, Divisional  
Delegate for Agriculture

Conference with Maroua Center DGRST/IRA Staff

PRESENT

NOM ET PRENOMS

Boli Baboule	Chief of Center, IRA Maroua	B.P. 33, Maroua
Wankwe Joseph	C.E.	MINPI/D/PROG, Yaounde
On P. Dangi	Sorghum & Millet Breeder	B.P. 33, Maroua
Nankam Claude	NCRE Plant Pathologist	B.P. 80, Bamenda
M.T. Fobasso	Project SAFGRAD, Chief Section Cereals	B.P. 33, Maroua
Kenga, Richard	Assistant Sorghum and Millet Breeder	B.P. 33, Maroua
Mekonichou, T.	Assistant Peanut Breeder	B.P. 33, Maroua
Richard B. Chalfant	Principal Investigator, Bean/Cowpea CRSP	GA. Coastal Plain Expt. Sta. P.O. Box 748 Tifton, GA 31795
Moffi Ta'Ana	Entomologist CRSP/Cowpeas	B.P. 33, Maroua
Henri Talleyrand	NCRE Cereals Agronomist	B.P. 435, IRA, Garoua
C. Owen Gwarhney	ACFO Agronomist/SAFGRAD Project	B.P. 33, Maroua
Jal Joffre	Service Experimentation SODECOTON	B.P. 302, Garoua
Schilling, TT	Peanut Breeder	B.P. 33, Maroua
Renou A	Antomologiste - Coton	B.P. 33, Maroua
Abdel M. Moustafa	Project Officer	USAID, Yaounde

Tuesday, 20 September (cont.)

Dinner at Maroua Airport hosted by Mr. Boli Zache Baboule, Chief of IRA Center, Maroua,

Guest of honor: Amadou Tidjani, 1st Deputy Divisional Officer.

Wednesday, 21 September

Presentation of Sorghum and Millet Program

Dr. Om P. Dangi, Sorghum and Millet Breeder.

Visit to IRA Guiring Research Station

Visit to IRA Djorengol Field Testing Area

Visit to Striga Control Experimental Plots at Ndonboli Village

Visit Sorghum Variety Test at Yaldio (Farmer field)

Hosted by Clan Chief Lawan Siddiki, Tribal Chief of 16 villages.

Tuesday, 22 September

Visit SAFGRAD Pre-Extension Sorghum Trial on Farmer's Field near Meme.

Shown by C.O. Gwathmey, ACPO Agronomist.

Visit SAFGRAD Pre-Extension Millet Trial on Farmer's Field North of Kourgui on Limani road.

Visit SAFGRAD Pre-Extension Sorghum and Maize Trials near Ngutchéwé.

Visit NCRE Sorghum Trials at Tuétalé IRA/SODECOTON Antenna

Visit Seed Multiplication Center, Tuétalé.

Friday, 23 September

Visit NCRE Sorghum Trials at SEMRY II, Maga Conference with SEMRY II Officials.

Mr. Lombardo, Chief d'Institute

Mr. Lonleu Etienne, Chief of Production

Friday, 23 September (cont)

Session on Response to Scope

Present: Baboule, Ayuk-Takem, Moustafa, Atayi,  
Joseph Amizobel Wankwe (Ministère du Plan), Dangi,  
Kikafunda-Twine.

Saturday, 24 September

Visit Socounda IRA Antenna

Inspected MSVAT.

Visit Projet Semencier at Sanguere

Tito Beca, Chief of Party

Joseph Elang 1/, Chief of Project

Arnet W. Jones, Project Coordinator (stateside).

Suha Satana, Finance and Accounting

Visit Agrilagdo Project Karewa Experimental Farm

Mr. Aboubakar, Chief of the Farm Project

Robin PL Digby, Engineer

Inspected Rice Experimental Work

Dr. D. Ianabiram

Inspected MSVAT

Dr. Om. P. Dangi

Monday, 26 September

Visit to Délégation Provinciale d'Agriculture du  
Nord, Garoua

Mr. Gourlemond, Provincial Delegate of Agriculture

Mr. Dabou Moise, Chief of Service, Provincial Nord, and  
Deputy Provincial Delegate of Agriculture.

Visit to SODECOTON, Garoua

Mr. Gruson, Director du Développement de SODECOTON

Visit to Talleyrand's Office in House Leased by  
IRA, Garoua

Boli Babouli, Chief of IRA Center

Henry Talleyrand, NCRE Cereal Agronomist

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1/ Not present

Monday, 26 September (cont.)

Ing. Ngoumou, Nga Titus, Talleyran's Counterpart

Visit to IRA Sanguere Antenna

Maize Agronomic Trials

Visit Projet Semencier Farm, Sanguere

Chung's maize variety trial, and isolation of variety 7843 seed increase.

Tuesday, 27 September

Visit IRA Antenna de Ichollire

Mr. Duelebure

Maize agronomic tests

Maize variety test

Visit SODECOTON Headquarters near Antenna de Ichollire

Wednesday, 28 September

Visit SODEBLE at Wassandé

Martin Kouebo, Director General

Samuel Njinembo Zeh, Deputy Director

Maize agronomic tests

Maize variety trial

SODEBLE wheat variety test

SODEBLE maize and wheat production fields

Thursday, 29 September

Conference with Ronald Levin, Director of the USAID Mission in Cameroon, Yaounde

Friday, 30 September

Conference on the Response to Scope of Work for the Nkolbisson Station

Mr. Bakala, <sup>1/</sup> Chief of Nkolbisson Station

Mr. Charles Thè, incoming Counterpart for Dr. Jay Chung

Mr. Zangue Cheuka, present Counter for Dr. Chung -

scheduled to depart in the near future to study for  
for M.Sc. degree in the U.S.

Mr. Ezekiel Passam, Counterpart for Mr. Toby Chamberlain

<sup>1/</sup> Not present

Friday, 30 September (cont.)

Dr. Abdel M. Moustafa

Dr. Emmanuel Atayi

Mr. Toby Chamberlain

Conference on NCRE, IRA

Director Jacques-Paul Ekebil

Deputy Director, Tony Maimo

Dr. Abdel M. Moustafa

Monday, 3 October

Conference on completing Evaluation Report

Mr. Samuel Scott, Chief of Project Development  
and Evaluation Division, USAID

Mr. William Litwiller

Dr. Abdel Moustafa

Ms. Randal Thompson

Conference on CICIP Assignment in Cameroon

Dr. J.E. Hunter, Professor of Plant Pathology,  
Cornell University, Ithaca, N.Y., CICIP Consultant

Dr. George Teetes, Professor of Entomology, Texas  
A&M University, College Station, CICIP Consultant

Wednesday, 5 October

Conference on Extension in Cameroon

Dr. Emmanuel A. Atayi

Mr. William Kelso, USAID Consultant on Extension

Conference on Completing Evaluation Report

Mr. Larry Dominessy

Mr. William Litwiller

Dr. Abdel Moustafa

Ms. Randal Thompson

Tuesday, 11 October

Presentation of Findings and Recommendations  
of the Evaluation Team (open meeting)

A total of approximately 45 people invited to attend by Dr. Moustafa. Exact attendance not known because Report "went to press" before meeting held

Persons Not Previously Listed

Dr. Emmanuel F. Deganus, Administrator, International Programs, IITA, Ibadan, Nigeria  
Dr. Yoel Efron, Program Leader, Cereal Improvement Program, IITA, Ibadan, Nigeria.

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Appendix v. Status of Maize Varieties Being Grown in Cameroon at  
the Time When the NCRE Began Its Research Activities

6 October 1983

Ermanuel A. Atayi

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At the time when the NCRE Project activities effectively began in early 1982, a number of improved maize varieties had already been recommended and were being cultivated in Cameroon. Some of these were exotic varieties introduced from neighboring countries and also from as far as the Caribbean region, while others were hybrids from Eastern and Southern Africa.

The IRA started its active maize breeding work in early 1970 and has since released many varieties for both lowland and highland ecologies; it is difficult, however, to estimate how extensively they are grown. The IRA varieties are characteristically tall, high in ear position and susceptible to stalk and root lodging. In addition, their performance has been rather unstable (location specific), although they have shown a high level of resistance to major local diseases, e.g. blights and rusts.

Most of the varieties grown by traditional small farmers are known to be degenerated seeds of unknown origin or a mixture of the above-mentioned varieties. A majority of the agricultural parastatal organizations in Cameroon grow exotic varieties from various sources.

Below is a list of maize varieties that existed prior to the beginning of NCRE activities in Cameroon:

VARIETIES DEVELOPED BY IRA

Lowland

- Ekona White
- Ekona Yellow
- Ekona Mixed Color
- Ekona Synthetic
- MLC (Multi-locational Composite)
- BS 2 (Bambui synthetic 2)

Highland

- BACOA
- BACOB
- COCA
- COCAB
- Polyhybrid 290
- BS 1
- BS 2

VARIETIES INTRODUCED

Lowland

- TZB (from IITA)
- TZPB (" " )
- Cuban Yellow (Caribbean region)
- Samaru 123 (Nigeria)
- NCA (Nigerian composite A)

Highland

- SAW (South Africa)
- GRH (Green Revolution Hybrid)
- H 632 (University of Hawaii)
- H 614 (Hybrid from Kenya)
- SR 52 (Zimbabwe)

Average grain yield of these varieties in 1982 local variety performance trials ranged from 4.1 to 4.6 tons for lowland and 4.6 to 6.0 tons for highland. (see tables attached)

As it is shown in Tables 2 to 19 in NCRE 1982 Annual Report, yield performance of these varieties which served as check entries in 1982 trials was up to 51 percent below the best introduced varieties.

COMPARISON OF CAMEROONIAN LOWLAND MAIZE VARIETIES IN 1982

VARIETIES	LOCATION										Mean Across Locations
	NYOMBE (40m)	SANGUERE (210m)	MODELLE (380m)	MAROUA-GUIRING (410m)	SOKOUN- DOU (420m)	NTUI (500m)	EKONA (460m)	BERTOUA (650m)	BEFANG (650m)	BABUN- GO (1776m)	
Ekona White	5.6	2.6	4.4	4.9	1.8	3.8	5.2	4.4	6.1	4.7	4.4
Ekona Yellow	5.1	3.9	4.6	4.8	2.4	4.0	6.3	4.7	6.0	4.1	4.6
Ekona Mixed Colour	4.7	2.5	4.8	4.7	2.1	3.2	5.4	4.0	6.4	4.2	4.2
Ekona Synthetic	6.0	2.4	4.5	4.4	2.1	3.8	5.6	4.3	6.2	4.3	4.4
M L C	3.7	2.3	4.2	4.1	2.5	3.1	5.4	3.7	5.6	6.1	4.1
B S 2	5.0	2.5	4.5	4.5	2.4	3.6	4.3	4.7	5.9	4.6	4.2
LOCAL CHECK	4.4 <sup>x</sup>	2.3 <sup>xx</sup>	2.1 <sup>xx</sup>	5.2 <sup>xx</sup>	3.6 <sup>xx</sup>	3.2 <sup>x</sup>	4.8 <sup>xx</sup>	1.5 <sup>xx</sup>	4.2 <sup>xx</sup>	3.2 <sup>xx</sup>	3.5
Location mean	4.9	2.6	4.2	4.7	2.4	3.5	5.5	3.9	5.8	4.5	4.2
LSO (5%)	0.2	0.7	1.2	0.5	1.0	0.5	0.8	1.5	1.0	1.2	0.5
C.V. (%)	15.4	21.4	22.3	7.8	23.9	10.2	11.9	28.7	12.8	19.6	8.4

x = Poza Rica 7843

xx = Local Unimproved Check from the Location.

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COMPARISON OF HIGHLAND MAIZE VARIETIES IN 1982

VARIETIES	LOCATION					YIELDS (T/ha)	Mean Across Locations	Rank
	Babungo (1776m)	Bambui Plain (1330m)	Bangangte (1450m)	Dschang (1500m)	Bambui Station (1600m)			
BACOA	4.4	3.6	6.6	5.1	3.7	4.7	9	
BACOB	4.9	3.3	7.4	4.3	2.9	4.6	10	
OPACO	5.0	3.5	7.5	3.9	4.3	4.8	8	
COCA	5.9	4.6	6.6	3.8	4.9	5.2	6	
COCAB	4.6	5.4	5.9	5.4	4.3	5.1	7	
S A W	5.9	4.3	8.4	4.9	4.7	5.6	4	
M L C	6.1	4.9	8.3	5.2	4.1	5.7	3	
POLY BYBRID 290	4.7	4.7	9.3	6.2	4.8	5.9	2	
DULK PRODUCTION	5.3	4.4	8.2	4.7	4.7	5.5	5	
BULK PROLIFICITE	5.6	4.3	8.0	5.2	4.5	5.5	5	
G R H	5.5	4.8	9.0	5.4	4.8	5.9	2	
B S 1	5.2	4.7	7.1	4.8	4.1	5.2	6	
B S 2	4.4	3.3	6.9	4.0	5.0	4.7	9	
H 632	6.1	6.6	7.0	4.9	5.5	6.0	1	
SR 52	5.9	4.4	6.6	4.4	4.8	5.2	6	
LOCAL CHECK	4.2	3.9	4.2	3.2	3.3	3.8	11	
Location mean	5.2	4.4	7.3	4.7	4.4	5.2	-	
LSC (5%)	0.4	0.6	1.0	0.6	0.5	0.4	-	
C.V. (%)	10.2	19.0	17.2	15.9	15.1	11.3	-	

A prosperous and progressive agriculture in any country is dependent upon all of the following:

- (1) A stable government that is sympathetic in its policies and support towards agriculture.
- (2) The necessary infrastructure in place.
- (3) The know-how of farmers to produce.

This requires research and delivery of its findings to users (farmers). Relevant research is also dependent upon this flow of information being a two-way street, i.e., information flowing back from producers to researchers.

Also important is that farmers are dependent upon continuous flow of new research information.

- (4) Availability of necessary "inputs" i.e., seeds, fertilizers, chemicals, credit, etc.
- (5) A marketing system, along with appropriate government policies, to match the production system.

While all of these five factors are important and necessary for a prosperous agriculture, the "Terms of Reference" for this Evaluation were limited to No(3) above and only for rice, maize, sorghum and millet. However, very limited attention are given to numbers (4) and (5).

1. Variety release and/or Recommendation

There shall be established in Cameroon at the national level a Board (committee) which will have the function of approving for production in Cameroon or some portion thereof all cereal crop varieties released and/or recommended by the IRA or by any other agency or individual. The plant breeder, Station, or any other individual or agency having a new variety for release and/or recommendation will submit all pertinent data on said variety to the Board. Based on available information, the Board will then make a decision on whether or not the variety should be released and/or recommended.

Suggested for membership on the Board will be persons from the following disciplines: IRA-plant breeding, agronomy entomology, plant pathology, Extension, the Seed Multiplication Unit; seed certification agency (if any); national seed testing laboratory (if any); parastatals and authorities; farmers; and any other appropriate agencies and individuals.

The Director of the IRA shall chair the Board.

The decision of the Board will be final.

2. Justification for additional positions

(a) Cereal agronomists

(1) Present staff

i. Dr. Henri Talleyrand with Counterpart Nga Ngoumou Titus at Garoua.

ii. Dr. Joseph Kikafunda-Twine at the Bambui Station with Ms. Pauline Zekeng as Counterpart (assuming that the shift for these persons from the TLU to cereal agronomy research is approved).

(2) Proposed additions

i. Cereal agronomist at Foubot with Cameroonian Counterpart.

ii. Cereal agronomist at Nkolbisson with Cameroonian Counterpart.

iii. Cereal agronomist at Maroua with Cameroonian Counterpart.

It will be noted that if the recommendations of the Evaluation Team are

carried out there will be in the NCRE five expatriate cereal agronomists with their respective Cameroonian Counterparts at five different and strategic locations.

The agronomists stationed at Maroua will work principally on sorghum and millet because these cereals (outside of rice) predominate in the areas. Going southward and as the annual rainfall increases, first millet and then sorghum gradually give way to maize. Talleyrand and Titus will work chiefly on maize in the principal maize producing areas of the North and Adamaoua Provinces.

The cereal agronomists at Nkolbisson (IITA and Cameroonian) will work principally on maize in the East, Central and South Provinces. The responsibilities for research of Dr. Kikafunda-Twine/Ms. Pauline Zekeng at Bambui, and the cereal agronomists IITA/Cameroonian Counterpart at Foubot will be divided either geographically or on the basis of lowlands/highlands. Together the two teams will be responsible principally for maize research in the North West, West, South West and Littoral Provinces.

The agronomic problems in cereal production in Cameroon are many and complex due to the following:

- (1) Variation in altitude, annual rainfall amount and pattern, latitude, and soils.
- (2) The variety of cropping practices such as mixed cropping, double cropping, double or even multiple cropping relay planting, and growing muskwari crops. The usage of crops for special purposes such as sorghum stalks for construction and maize to be eaten green must be considered. Superimposed on the above are production practices such as land preparation; planting methods; density of stand -- both degree and pattern; weed, disease and pest control, including use of chemicals; fertilization; method of harvesting; drying; and storage. Finally, the taste preferences and nutritional qualities must not be overlooked.

It would be impossible in advance to delineate the areas of research for the cereal agronomists. As indicated above the problems are many and complex -- for more than can be worked on at one time. The best way to proceed is to have as many cereal agronomists as possible (five are proposed)

and let each one, after studying the situation with counsel from others, establish the research program that is indicated.

### 3. The Concept Paper of TLU

Perhaps not specifically stated in the report it is the recommendation that some revision in the concept of the TLU take place. As noted the recommendation is for one person in each TLU rather than two. The second TLU person currently involved in "Operational Research" or field trials is essentially a researcher and should be so called. The one person making up the TLU would be the liaison person between Research and Extension -- a sort of broker bringing two persons (researcher and farmer user) together but not being a principal. The Extension staff being trained is and should be selected by the Ministry of Agriculture and the liaison person being familiar with all the research resources in NCRE and the IRA would arrange the training schools and activities. Activities would include not only the training schools and field activities in conjunction with the research and Extension people but also inducing researchers to prepare information material for farmers.

Recommendations in the report are for two more TLU's.

The extension agronomists are recommended in order to accelerate the research work of the cereal breeders. Variety breeding and subsequent recommendation requires extension agronomic research to be meaningful and appropriate for the wide range of site factors and agronomic practices existing in Cameroon. Not only will the agronomists greatly enhance the production of the cereal breeders but they will also be able to contribute importantly to the extension effort of the TLU via more demonstrations and field trials but also prepare extension type material for the TLU and the Extension Service.

A wider and greater use of the research results could be made by the addition of two more TLU personnel. The concept of the TLU is revised somewhat in the report and in this addenda to result in the liaison person at each of three locations. No TLU is recommended for northern part of Cameroon but the seven southern countries representing the balance of Cameroon we feel could be covered by positioning one person at Bambui, one at Ekona and one at Nkolbisson.