AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: C (A = Add, C = Change, D = Delete)

Amendment Number: 1

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: CAMEROON

3. PROJECT NUMBER: 631-0013

4. BUREAU/OFFICE: AFRICA 06

5. PROJECT TITLE (maximum 40 characters): NATIONAL CEREALS RESEARCH AND EXTENSION

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 12 DD 31 YY 94

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 79 B. Quarter 4 C. Final FY 95

8. COSTS ($000 OR EQUIVALENT $1 =

A. FUNDING SOURCE	FIRST FY 79 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(815)	(60)	(875)	(30,509)	(12,610)	(43,119)
(Loan)	(-)	(-)	(-)	(-)	(3,605)	(3,605)
Other U.S. 1.						
Other U.S. 2.						
Host Country	-	180	180	-	32,434	32,434
Other Donor(s)						
TOTALS	815	240	1,055	30,509	48,649	79,158

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ARDN	111	080	080	6,800	-	35,422	3,605	43,119	3,605
(2)									
(3)									
(4)									
TOTALS				6,800	-	35,422	3,605	43,119	3,605

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)

11. SECONDARY PURPOSE CODE

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code

B. Amount

13. PROJECT PURPOSE (maximum 480 characters)

To develop Cameroonian institutional capacity to provide high quality research on maize, rice, sorghum and millet and to facilitate utilization of research results by farmers. Cereals research will be integrated into a cropping systems approach to food production and be aimed at the problems of farmers. (The purpose statement from current NCRE project is still valid)

14. SCHEDULED EVALUATIONS

Interim MM 04 YY 88 MM 04 YY 91 Final MM 04 YY 95

15. SOURCE/ORIGIN OF GOODS AND SERVICES

[X] 000 [ ] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a 46 page PP Amendment.)

The amendment extends the life of project by 9 years to achieve the institution building objectives of the project. Nine research scientists are added to the technical assistance team, three additional Testing and Liaison Units are added to extend research and pre-extension coverage for the national cereals program and a loan component will finance construction of researcher houses, seed laboratories, warehouses and offices. Both M.S. and Ph.D. level training is scheduled with intermittent phases of on-the-job training in Cameroon.

17. APPROVED BY

Signature: Ronald D. [illegible]

Title: Mission Director

Date Signed: MM DD YY

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1330-4 (8-79)

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PROJECT PAPER SUPPLEMENT

NATIONAL CEREALS RESEARCH AND EXTENSION
(631-0013)

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(A) Revised Logical Framework -- to reflect expanded resources and inputs/outputs (1985-1995).

(B) Detailed Procurement Plan and Waivers

(C) Supporting Economic and Financial Exhibits

(D) Detailed Engineering Analysis and Construction Program -- including FAA 611(a)(1) Certification

(E) Specific Areas of Policy Concern Related to the Successful Implementation of the Expanded NCRE Project

(F) Technical Assistance and Training - Summary of Resources (1981-1995)

R E F E R E N C E S

- Project Paper: National Cereals Research and Extension Project (631-0013)

- National Cereals Research and Extension Project Evaluation (E. Frolik and G. Alcorn), October 1983

(Both above references are available at USAID/Cameroon or AFR/PD, AID/Washington)

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PROJECT PAPER SUPPLEMENT

National Cereals Research and Extension Project
(631-0013)

I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

It is recommended that the National Cereals Research and Extension (NCRE) project be extended for nine years from the Project Assistance Completion Date of December 31, 1985 to December 31, 1994 and that Loan and additional Grant funding be authorized in the amount of $39,027,000 ($3,605,000 on Loan funding and $35,422,000 in Grant funding).1/ Funding increases bring the total U.S. contribution during the period from FY 1979 through FY 1995 to $46,724,000 ($3,605,000 in Loan funding and $43,119,000 in Grant funding). The funding increases are required to provide additional technical assistance, training and commodities/equipment to the GRC in support of its cereals research effort over the period 1985 to 1995.

B. Summary Financial Plan

To extend the life of the NCRE project over approximately a nine-year period as described in this Project Paper Supplement, total costs* are estimated at $65,528,000. AID will fund 61.2 percent and the GRC will fund 38.8 percent of these costs. (See Part VI and Annex C for detailed breakdown of projected expenditures for both the AID and GRC contributions).

1/ Financial Plans presented in this Supplement cover the period from FY 1985 to FY 1995. FY 1985 funding projections shown in these tables include funds currently authorized for the life of the project in the amount of $7,697,000, as explained in footnote (2) to Table A2, Section VI. Obligations to date amount to $6,800,000 and USAID/Cameroon is withholding an allowance for the balance of current LOP funding for obligation pursuant to authorization of the PP Supplement. See Section VI-A, Financial Summary.

* All costs are given in January 1984 prices. A conversion factor of CFA 350 - $1.00 has been used throughout.

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($ 000)

	USAID				GRC		TOTAL	
	GRANT FUNDS		LOAN FUNDS					
	FX	LC	FX	LC	FX	LC	FX	LC
Technical Assistance	13,043	2,019	-	-	-	-	13,043	2,019
Training	1,755	548	-	-	-	-	1,755	548
Commodities	1,173	853	-	-	-	-	1,173	853
Other Costs	-	3,732	-	-	-	-	-	3,732
Construction	-	-	-	2,666	-	-	-	2,666
Cash Costs	-	-	-	-	-	13,596	-	13,596
Subtotal	15,971	7,152	-	2,666	-	13,596	15,971	23,414
Contingency	1,597	715	-	667	-	-	1,597	1,382
Inflation	5,973	4,743	-	272	-	11,849	5,973	16,864
Evaluations*	327	-	-	-	-	-	327	-
Subtotals	23,868	12,610	-	3,605	-	25,445	23,868	41,660
Totals	36,478		3,605		25,445		65,528	

*Including Contingency and Inflation.

C. Summary of Project-Related Issues

Because this supplement to the NCRE Project Paper will extend AID's resource commitment and inputs over a relatively long-term time frame (approximately 10 additional years), it is worth noting important project-related issues and concerns which are likely to have an impact on successful implementation of the project.

The original objective of the NCRE project and of this Supplement is the continued development of a Cameroonian institutional capacity to provide high quality applicable research on cereal crops and to facilitate transmission of research results to the farmer. The effective utilization of these results to meet the growing demand of food crop production in Cameroon depends upon a variety of interdependent forces and policies in such areas as population growth, marketing, and the timely provision of essential agricultural inputs. USAID/Cameroon believes that the GRC has a keen awareness of its needs in all of these areas. Annex E describes specific areas of policy concern which need to be addressed during the life of the proposed expansion of the NCRE project.

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D. Waiver Requirement

Grant Component:

1. A source/origin procurement waiver in the amount of $60,000 is requested to procure six 2-wheel drive station wagons from a Western European country (probable origin). The probable source is Cameroon. The only dealer in Cameroon handling U.S. manufactured vehicles is Renault-Cameroon which offers sales and services only for 4 wheel drive vehicles.

2. A proprietary procurement waiver in the amount of $48,000 for three (3) AMC jeep-type 4-wheel drive utility vehicles. The only U.S. manufactured 4-wheel drive vehicles which can be supported (by Renault-Cameroon) in the project areas are AMC jeep-type.

Loan Component: None.

E. Conditions Precedent and Covenants

The following conditions precedent and covenants shall be included within the Project Agreement Amendment which will implement the approval NCRE extension.

1. Conditions Precedent to Disbursement

Prior to first disbursement or the issuance of any commitment documents under the Project Agreement, the Government of Cameroon shall furnish in form and substance satisfactory to AID:

a. For the Loan only:

An opinion of counsel, acceptable to AID, that the Loan Agreement has been duly authorized and/or ratified by and executed on behalf of the Government of Cameroon and constitutes a valid and legally binding obligation of the Government of Cameroon in accordance with all its terms.

b. For the Loan and Grant:

A statement of the name of the person acting as authorized representative of the Government of Cameroon, and the names of any additional representatives, together with the specimen signatures of each such authorized representative.

2. Additional Disbursement

Conditions Precedent to Disbursement for Construction Services (For the Loan Only)

Prior to disbursement of the Assistance for each construction activity under the Project Agreement, or to the issuance of documentation pursuant to which disbursement will be made with

respect thereto, the Government will, except as AID may otherwise agree in writing, furnish to AID, with respect to such construction activity, in form and substance satisfactory to AID:

a. an executed contract acceptable to AID, with a firm acceptable to AID, for architectural and engineering services and for construction supervision of such construction activity;

b. plans and specifications, bid documents and time schedules for such construction activity; and

c. an executed contract for construction services for such activity with a firm acceptable to AID.

3. Covenants

a. The Government of the Republic of Cameroon agrees to provide, in a timely manner, counterparts for the members of AID-financed technical assistance team.

b. The Government agrees that Cameroonians receiving AID-financed long-term participant training will spend a minimum of five years working with IRA cereals research and extension program following the completion of their final degree.

c. The Government agrees that every effort will be made to ensure that suitable quantities of fertilizers and credit will be available to cereals farmers.

d. The Government agrees to provide adequate financial support to maintain AID-financed equipment, vehicles and buildings after the project has ended.

e. The Government agrees to maintain its policy of a free-market pricing system for food crops.

II. BACKGROUND

A. USAID Assistance in the Agricultural Sector

From its inception, the USAID program in Cameroon has emphasized agriculture. In the early years of the program the development needs of Cameroon were neither well enunciated by the GRC nor coherently addressed by USAID. Several of small interventions were instituted in areas where it appeared a development need existed. Both the experiences with these interventions and a continuing GRC policy evolution led USAID, in the early 1980's, to re-examine its development strategy in Cameroon and to sharpen its program focus on the agricultural sector.

At the same time, the GRC has clearly signaled its desire that American assistance play a major role in the food-crop sector. Cameroon's Fifth Five-Year plan came into existence in 1981 showing clear signs of an increased recognition of the rural economy's role in Cameroon's development progress and the essential requirement for increased emphasis on food production. This new plan calls for systematic introduction of food-crop components in all development projects, intensification of food-crop research, greater credit availability for food-crop farmers, priority in the distribution of improved seeds, increased areas of cultivation for food crops, and programs to reduce post-harvest losses.

The GRC has recognized the predominant capability of the United States in agriculture and has sought program assistance in training, research, analysis, and extension. USAID has responded with a program that will capitalize on this special U.S. competence. It is helping to build and staff an agricultural university modeled after the U.S. Land-Grant system integrating academic and technical training, research and extension. USAID/Cameroon has been in the forefront of introducing the land-grant model of agricultural education in Francophone Africa and believes it has played a significant role in facilitating this policy decision by Cameroon. USAID/Cameroon began the present National Cereals Research and Extension Project and enlisted technical assistance from the International Institute for Tropical Agriculture (IITA) to carry out a program of scientific and applied research on cereal crops. It instituted a project to assist the GRC undertake a national agricultural census and perform annual agricultural surveys to provide the data base for enhanced agricultural planning. It refocused its efforts in seed multiplication to strengthen linkages with research and provide for the possibility of moving the operation into the private sector. The result of the foregoing has been distinctive and substantial progress over a wide range of the agricultural sector.

B. Special Emphasis on Agricultural Research

Agriculture research is one of the mainstays in USAID/Cameroon's program. The GRC has itself recognized the importance of agricultural research in its Fifth Five-Year Development Plan and underlined its continuing and growing importance.

The USAID/Cameroon Country Development Strategy Statement (CDSS) enunciates Mission strategy to assist the GRC develop the institutions needed to carry on research and development, including training of the Cameroonian staff necessary to continue these activities.

C. Project Paper Supplement Mechanism

Over the last six months Institute of Agronomic Research (IRA) and USAID/Cameroon have conscientiously worked out the technical details and planning for a strategy to modify, expand and extend the project by about ten years. Special ad-hoc working committees met at frequent intervals to resolve technical, financial and other concerns related to this strategy. At a joint (IRA, IITA and USAID) review session on March 15, 1984 the basic terms and conditions of the proposed modification were agreed upon by all parties.

The modification has been developed and planned in accordance with guidance provided in AID Handbook 3, Chapter 3 (Project Modifications). This guidance outlines the mechanism whereby an approved project can be amended to facilitate the attainment of its original goals and objectives. In such instances where more funds or more time are required to continue with a successful development effort, the handbook recommends the concept of a "Project Paper Supplement" to satisfy design and approval requirements.

The main strategies and basic parameters of the original NCRE Project Paper remain intact. However, in order to more successfully accomplish the project's long-term goals in cereals research and the Government of Cameroon's institutional development objectives, additional resource inputs over a greatly expanded time frame will be needed from both AID and the GRC. This Project Paper Supplement is directly related to Agency recognition that agricultural research institution building initiatives in developing countries must be pursued on the basic premise that success depends on a firm commitment to long-term involvement by both donors and recipients alike.

The basic mix of project components, assumptions and agricultural research priorities remains the same as those identified in the original project paper. With this in mind, the intent of the PP Supplement is not to alter the established set of goals and objectives of the NCRE project, but to highlight the absolute necessity for additional resources (human and financial) and time to satisfy Cameroon's long-term cereals research needs. Consequently, the original NCRE Project Paper remains the basic reference document, with this supplement serving mainly as a synopsis of the recognized insufficiency of the original paper and a detailing of the expanded resource inputs, time frame and plan of action.

III. RATIONALE FOR EXPANDING AND EXTENDING THE NCRE EFFORT

A. Background

Earlier this year, the Administrator confirmed (State 015957, dated January 18, 1984) that the Agency is ready to provide increased resources to the support of research activities. The Africa Bureau's Agricultural Research Strategy (AFR Memorandum of April 4, 1983) states: "the nature and magnitude of the task of strengthening national agricultural research systems, and the time required to develop cooperative and complementary programs to produce useful production technologies, requires that donor assistance programs be cast in a long-term framework - ten to twenty years. This will require a more flexible and evolutionary approach to project design and implementation".

In the past year the GRC has more than doubled its operational budget for the Institute of Agronomic Research (IRA), the organization responsible for all agricultural research and the parent organization under which the National Cereals Research and Extension Project (NCRE) operates. The progress and potential of agricultural research in Cameroon have also led the GRC to seek World Bank assistance in making major improvements in the infrastructure of Cameroon's agriculture and livestock research centers and to strengthen their research programming and administrative capacity. Concurrent with the World Bank's review of the GRC proposal, USAID reassessed its own NCRE project and determined that the experience and success already achieved have clearly defined the remaining task.

The initiatives being taken by the GRC and a general congealing of the USAID/Cameroon strategy over the past three years auger for a full commitment now to the long-term needs of this endeavor. This commitment is two-fold: to address the GRC's long-term needs to firmly establish its institutional capability for cereals research while addressing the immediate need for adaptive research; and, to reinforce extension activities under the project to ensure that research being conducted is relevant, that results are put in a form that is available to the farmer, and that time is allowed for the extension role of the land-grant model agricultural university at Dschang to come on line. The original NCRE project paper had suggested that these objectives be accomplished through a series of phased projects. However, experience to date has defined more clearly the requirements of this institution-building task.

Addressing a long-term problem through a series of short-term actions is basically contradictory. What is required, especially in institution-building, is continuity and assured commitment. Bringing in high-level technical assistance personnel to both perform and teach certain functions, and then leaving behind counterpart personnel with lesser academic credentials and little practical experience to "carry on", can only assure the "building" of a second-rate institution and a shortening in height of the Agency's policy pillar. Past design efforts have traditionally been geared toward "stengthening" and "reenforcing" with little regard for excellence. The NCRE project paper supplement is designed to leave behind a quality institution which can interact on a peer basis

with fellow national and international research institutes rather than forever being a country-cousin dependent upon outside advice and guidance. It is only with this achievement of excellence that the institution itself can be assured of viability, longevity and the ability to contribute.

The Institute of Agronomic Research and its agricultural experiment stations are the main sources of technological innovation and packages for small-farmer food producers in the rural areas of Cameroon. As in most developing countries, national agricultural research institutions find it difficult to maintain contact with extension services and the ultimate users of their product. The NCRE project in Cameroon provides direct support to Cameroon's Institute for Agronomic Research for this purpose through the concept of the Testing and Liaison Unit (see section III. D. 3) which was introduced to link research, extension and the farmers. Success to date has prompted the desirability of immediate expansion.

The relationship between the Institute for Agronomic Research and the Agricultural University at Dschang presents yet another rationale for an expansion of the NCRE project. IRA had previously been under the General Delegation for Scientific and Technical Research (DGRST) - an autonomous ministerial level organization under which all research activities in Cameroon were conducted. In February 1984, the various research institutions of DGRST were absorbed into a new Ministry of Higher Education and Scientific Research. This new Ministry therefore has oversight of both the Agricultural University and IRA. The new Minister is the former Director General of the University and was the prime moving force in gaining GRC adoption of the land-grant model concept. The distinct possibility of future amalgamation of research institutions and the university system fits perfectly within the land-grant system approach and is a bonus to the long-term involvement which USAID/Cameroon and the University of Florida have embarked upon with the agricultural university.

As stated above, the IBRD has also recognized the great potential of Cameroon's system of research institutions and has worked with both the GRC and USAID/Cameroon in developing a major project to strengthen the research programming, administrative capacity and infrastructures of both IRA and the Institute for Livestock Research (IRZ). The design of this IBRD initiative has been undertaken in close collaboration with USAID/Cameroon to assure a complementarity of efforts and to avoid duplication.

The longer term involvement which the NCRE project extension will afford IITA, the projects technical assistance contractor, will assist it to further consolidate its relations with Cameroon and with IRA in particular. This will facilitate action on a recommendation of the Consultative Group on International Agricultural Research (CGIAR's) 1983 Five-Year Review of the IITA program to move portions of IITA's rice research activities to Cameroon, a move which would provide even more complementary support to the expanded NCRE project and improve the effectiveness of IITA's overall efforts in international rice research.

B. The NCRE Project Origin

The NCRE project was authorized by the Assistant Administrator for Africa on August 17, 1979 in the amount of $7,697,000. Its purpose is to develop the institutional capacity of Cameroon's Institute of Agronomic Research to provide high quality research on maize, rice, sorghum and millet, as well as to develop efficient linkages to facilitate transmission of research results to farmers. The project is implemented within IRA, which is now under the Ministry of Higher Education and Scientific Research. On January 13, 1980 the NCRE project contracted with IITA for the provision of high-level researchers to implement the critical technical assistance component of the project. A chief of party, eight researchers and an administrative assistanct have been stationed in various agronomic zones of Cameroon to conduct research and undertake studies relevant to the farmers of those regions.

C. Evaluation of the Project

An evaluation of the project was conducted in September and October of 1983 by two evaluation consultants: a former Dean of the College of Agriculture at the University of Nebraska, and a former Director of the Cooperative Extension Service at the University of California, Berkeley. They were assisted by the USAID Project Officer and the IRA Coordinator of Cameroon's National Cereals Program. A copy of the Project Evaluation Summary (PES) is on file in USAID/Cameroon and in AFR/PPE.

This comprehensive evaluation of the NCRE project analyzed performance of project activities to date with particular emphasis on the effectiveness of the project in contributing to sector goal objectives. Evaluation team recommendations were extremely favorable and, in recognition of the long gestation period between investment in research and increases in production, strongly recommended continuing resource inputs by AID over a longer period of time.

The evaluation's recommendations form the basis of this Project Paper Supplement.

The evaluation also highlighted several potential problem areas which further support the need for expanding the time-frame and resource inputs for the NCRE project:

- The relatively short time-horizon had induced some project researchers to conduct too many experiments over too wide an area in order to satisfy the numerous clientele who want the results as rapidly as they can be generated. The demand for research results and improved varieties, and the enthusiasm of NCRE researchers, could therefore conceivably result in developing technological packages accepted by farmers and parastatals prior to adequate testing and verification.

- The evaluators noted that the Testing and Liaison Units' role in strengthening the relationship between research, extension and farmers has been constrained due to the fact that the project has only one operational TLU.

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- The evaluators recommended that additional equipment be procured and several uniform laboratory-warehouses be constructed to enhance the productivity of the technical assistance team and their counterparts. This gap was also highlighted by CGIAR in the report of its Five-Year Review of the IITA program held in 1983.

  The evaluators concluded that the training program as planned in the existing NCRE Project Paper is inadequate in terms of the targeted academic degree levels proposed for participants to be trained by the project. The evaluators recommended that every IITA researcher should eventually be replaced by Cameroonians holding the Ph. D. degree. Hence, returned participants with B. S. or M. S. degrees should be sent back to the United States for further training, after working at IRA for at least one year. Training to the Ph. D. level will also help to ensure that the returned participants will have an adequate salaries and status to function effectively in the Cameroonian system.

D. Status of Original Project Paper Outputs as of March 1984

1. Development of Cameroonian-Staffed Institutional Capacity for Research on Maize, Rice, Sorghum and Millet

Two Cameroonians have been trained and returned to their positions as counterparts in the NCRE project development. The first obtained a Ph.D. in Maize Breeding from North Dakota State University and is presently a counterpart of the NCRE Maize Breeder in the Yaounde region. The second obtained a B.S. in Rice Agronomy and an M.S. in Rice Breeding from Louisiana State University. He returned in 1983 and is presently a counterpart of the NCRE Rice Agronomist in the Dschang region. A third (non-project trained) person with a Ph.D. in Maize Agronomy from North Dakota State University (1983) has been hired by IRA and assigned to work with the NCRE team.

Presently, there are six Cameroonians in the U.S. working for the following degrees: an M.S. in Rice Agronomy at Louisiana State University; an M.S. in Cereals Agronomy and Extension at South Dakota University; an M.S. in Cereals Agronomy and Extension at the University of Missouri; an M.S. in Grain Storage Entomology at Kansas State University; an M.S. in Maize Breeding at Cornell University; and a B.S. in Cereals Agronomy at California State University. These participants will be respectively returning to Cameroon throughout the next two years. In addition, one participant will depart shortly to study for an M.S. degree in Plant Pathology.

2. Development and Implementation of Research Programs for Maize, Rice, Sorghum and Millet, including Trial Demonstrations on Farmers' Fields

a. Maize Improvement and Breeding Program:

Numerous internationally known maize materials from IITA, CIMMYT, national maize improvement programs in Africa, varieties previously developed by IRA, and local varieties provided by farmers were planted to determine which maize materials grow best and where. All nine provinces in the three major agroclimatic zones (Lowland Rain Forest, Lowland Savannah and Mid-Altitude Subtropic) were covered. These trials were conducted at: (1) ten different IRA stations; (2) parastatals and rural development projects such as the Societe de Developpment de Coton (SODECOTON); the Mission de Developpement des Cultures Vivrieres (MIDEVIV), the Societe de Developpement du Nord-Ouest (MIDENO), the Societe de Developpement du Ble (SODEBLE), and the Centre National d'Etudes et d'Experimentation du Machinisme Agricole (CENEEMA); and (3) farmers' fields. The results proved these newly introduced varieties in some cases, to give twice as much yield when compared to varieties commonly used in these locations. The new promising varieties have been advanced into national variety trials that will lead to identification of stable, disease resistance varieties suitable for specific agroclimatic zones in Cameroon. In northern Cameroon, where rainfall is limited, separate observational trials have been conducted to identify promising early to medium maturing varieties of maize. A program to genetically refine maize varieties and to maintain their purity for the future development of foundation seed is also underway.

b. Maize Agronomy Program

The maize agronomy unit in IRA-Garoua has conducted a series of agronomy trials in several IRA stations, parastatals and farmers' fields in the North, Northwest and Southwest of Cameroon. Additional experiments were also carried out at the Karewa Experimental Farm in an effort to explore the potential for off-season maize production under irrigation in the Benoue Valley. The main objective of the maize agronomy research project is to develop appropriate and improved packages of cultural practices for maize farmers, and to evaluate the relative interaction and impact of climatic, soil and management constraints on the productivity of maize and maize-based cropping systems. Initial results have confirmed the high potential of the lowland savannah region for successful maize production when improved and appropriate packages are used. Agronomists are also conducting a series of palatability tests in collaboration with the Ministry of Agriculture, SODECOTON and the World Bank's Center-North project. The Maize Agronomists are determining the performance and yield effects of the following factors: varieties; method of application and amount of

fertilizers; differential effect of the preceding crops on maize response to fertilizers; impact of frequency and type of weed control; planting dates; liming and phosporus application on maize grown in ferralitic soils of the Adamaoua region, and plant population density. The maize research program deals with maize as a monocrop, intercropped, and in rotation with legumes such as groundnuts and cowpeas.

c. Rice Improvement and Breeding Program:

The Rice Breeder and Rice Agronomist are concentrating their efforts in developing high-yielding rice varieties for two major irrigated rice development projects: the Upper Noun Valley Development Authority (UNVDA) located in the Northwest Province; and the Societe pour le Developpement de la Riziculture de la Plaine de Mbo (SODERIM) located in the Western Province. These two irrigated rice projects need research support to develop new technologies which will increase total rice production. A research program is also underway to develop technologies for growing upland rice at the small-farm level. During the last two growing seasons hundreds of rice varieties, lines and cultivars were introduced from IITA, the International Rice Research Institute (IRRI), the Institut de la Recherche Agronomique Tropicale (IRAT), and national programs in India, China, Taiwan and Sri Lanka. These materials have been screened and tested at appropriate sites under different ecological conditions with the objective of identifying high-yield potential in combination with resistance to blast, leaf scold, brown spot, lodging and cold. Results to date have identified several disease resistant varieties which out-yielded previously recommended varieties

d. Rice Agronomy Program

Trials have included study of nitrogen response, nitrogen management (Urea vs Ammonium sulfate), phosphorus response, plant population density, the effect of incorporating the green algea Azolla, green manuring with Sesbania aculeta, seedling age effect, and weed management. Trials have also included evaluating the yield of sweet potato varieties which can be incorporated into the rice farming systems. Results to date have proven that green manuring of transplanted rice with Sesbania aculeta can increase yield by up to 34% and Azolla incorporation can increase yield up to 10%.

e. Sorghum and Millet Program:

This program is conducted by the IRA-Maroua station in the Extreme North Province. Its primary objective is to select and breed suitable sorghum and millet varieties which are both high yielding and stable across a range of environments including a rainfall range of 400 to 1500 mm. Numerous sorghum materials from ICRISAT, Upper Volta, Nigeria, and the IRA collection of transplanted

sorghum (Muskwari) were screened to identify lines for variety release or for a future hybridization program. The following criteria are being given major importance in selection: high yield potential; drought tolerance; short to medium plant stature; and resistance to striga, grain mold, leaf diseases and stem borers. The program is being conducted in close collaboration with the research program of the World Bank's Center-North project and the staff of SODECOTON. In addition, varieties are being developed for incorporation into the farming system of the IBRD/FAC supported rice project Societe d'Expansion et de Modernisation de la Riziculture de Yagoua (SEMRY) in northern Cameroon. The sorghum breeder is also conducting a program to study the intercropping of sorghum with photo-insensitive erect cowpea cultivars in collaboration with the Bean/Cowpea CRSP and has started a sorghum hybridization program between two local varieties and thirteen selected exotic materials.

3. Develop and Operate a Testing and Liaison Unit (TLU) to Transmit Agronomic Research Results to Extension Agencies and Farmer's Problems to the Researchers.

The TLU is located at IRA-Bamenda in the Northwest Province which covers 18,000 square kilometers and has a population of about one million inhabitants. Accomplishments include:

a. Training.

Three two-week courses in methods of farming systems research were conducted for Ministry of Agriculture field demonstrators and parastatal extension agents. The total number of extension workers trained in 1982 and 1983 were 110. Training objectives were: (1) to familiarize the participants with basic principles of food crop production; (2) to teach them how to work with farmers in extending improved methods of crop production; (3) to instruct them in carrying out basic socio-economic surveys; and (4) to train them in conducting on-farm demonstrations. At the end of the course the participants were given an improved variety of maize seed with instructions on setting out an on-farm maize demonstration as well as a questionnaire to collect preliminary information on population statistics, farming practices and names of key village contact persons. The TLU technical assistance team visits each of the participants in the field to observe the maize demonstrations and to collect the questionnaires. Thus far, the survey has provided useful information on local farming systems, cropping calendar, maize/rice crop rotation, land tenure, labor, livestock, credit, and extension services.

b. On-Farm Demonstrations and Trials

This activity has observed and measured the performance of improved maize varieties on farmers' fields in various areas, demonstrated the advantage of using improved varieties with or without fertilizer, identified constraints to increased maize production on village farms, and provided preliminary insights which will aid in the development of an on-farm research methodology to ultimately

determine the recommendations to be extended to all farmers in a given area.

c. Economic Surveys

Several Marginal Rate of Return (MRR) analyses based on budget analysis of various varieties and fertilizer usages were performed. Growing an improved variety as opposed to a local maize showed a 125,000 FCFA increase in net benefit per hectare for those farmers who switched from production of the local variety without fertilizer to production of the improved variety using a moderate fertilizer rate. It was also determined that 63% of this increase was attributable to the influence of fertilizer on the improved variety. It is important to note that the fertilizer used (20-10-10) in obtaining these favorable results is not the most suitable but is presently the only type available to farmers through cooperatives. The availability of more suitable fertilizers should therefore increase yields even more.

d. Establish and Maintain Links and Information Exchange with International, African and Cameroonian Institutions Conducting Agronomic and Socio-Economic Research

The NCRE project is in constant contact with scientists from IITA, IRRI, CIMMYT, ICRISAT, and other international agricultural research centers., The leaders of the cereals improvement programs of these international agricultural centers have visited NCRE researchers and reviewed their individual programs. In addition, NCRE researchers visit almost annually the international research centers that deal with crops relevant to their individual research. During 1981 and 1982 the NCRE team held a workshop where agronomists, representatives from IITA, the World Bank, FAO, IRAT, and directors of parastatal organizations met for three days to discuss the results and work plan of the NCRE team. In January 1984 this workshop was transformed into a National Cereals Research Program Seminar at which NCRE researchers, their Cameroonian counterparts, and researchers sponsored by other donors presented the results of their efforts and discussed their individual research plans.

e. Adequate Physical Facilities and Equipment for Carrying Out the Cereals Research Program

The evaluation clearly points out that an insufficiency of supplies and field laboratory equipment is having a constraining influence on the NCRE researchers ability to effectively undertake their duties and responsibilities. Although IRA has made considerable effort to insure that proper facilities and equipment are available to researchers on the NCRE technical assistance team, most of the field locations report a lack of modern equipment to be the largest single constraint to their productive research output.

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Common complaints among researchers are that available plant and soil testing equipment is old and outdated, and that the quantities of equipment on hand are not sufficient to permit them to perform at optimum levels of efficiency. The procurement plan for this project paper supplement (see Annex B) identifies the specific equipment needs to support project research activities and the procedures to avoid delays in delivery of the commodities to IRA/NCRE research sites in Cameroon. The problem of adequate physical facilities is also being addressed and a revised program for engineering and construction (see Annex D) will focus all available resources on providing the required physical facilities (i.e. laboratory-houses, office space, and residential quarters).

E. Coordination and Complementarity of the World Bank's National Agricultural Research Project with the NCRE Project

The GRC is in the process of negotiating with the World Bank a five-year project entitled, "Cameroon National Agricultural Research Program". The total cost of the project, including IBRD and GRC contributions, is 45.9 million dollars. Seventy five per cent of the budget, or 34.4 million U.S. dollars, will be allocated to strengthen the managerial and administrative capabilities of IRA and its sister livestock research institute (IRZ) in conducting relevant research programs. The project will provide technical assistance in areas which are not covered by the NCRE project, i.e. research management, finance and accounting, biometrics, agronomy of root and tuber crops and horticulture, as well as provide additional complementary construction of houses, laboratories and office space at agricultural experiment stations. The project will establish a library/documentation center and a radio network as well as provide mini-computer installations and agro-meteorological instruments. Finally, the project will provide IRA with training programs for 9 Ph.D and 20 M.Sc. degrees in areas corresponding to its technical assistance component.

The IBRD design team believes that the TLU concept is key to the success of all agricultural research endeavors. They agreed, however, that continuity and consistency of application in this concept is essential and therefore requested USAID to expand the role of TLU's in the NCRE project rather than have a parallel effort in its own project. This collaborative design effort resulted in USAID/Cameroon's agreement to include three additional TLU's in different agroclimatic zones within the NCRE expansion. In fact the IBRD's loan agreement will have as a condition precedent the GRC's acceptance of these additional TLU's within the expanded NCRE project.

The IBRD project, designed in close coordination with USAID/Cameroon, provides those complementary institution building elements absent in the NCRE project yet essential for the strengthening of IRA as an institutional entity.

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IV. THE EXPANDED VERSION OF THE NCRE PROJECT

The evaluation provided evidence that the current NCRE project is experiencing success in delivering designated outputs within the targeted time-frame outlined in the original project paper. However, it has become clearly evident to both the GRC and USAID, after only two planting seasons, that additional time and inputs will be required to ensure that institutional building goals are achieved and that project outputs are extended to other agroclimatic zones throughout Cameroon.

A. Testing and Liaison Units (TLUs)

During the first two operational years (1982-83) of the NCRE project, one TLU was established in the predominantly maize producing area of Cameroon's Northwest Highlands. This TLU unit consists of one NCRE Extension Agronomist and one Agricultural Economist, two IRA counterparts and several field assistants. The unit has undertaken a farming systems research approach to accomplish the following tasks: Agro-socio-economic surveys; on-farm trials; on-farm demonstrations of improved varieties and agronomic practices; and the training of extension agents from the Ministry of Agriculture and parastatals. The role of the TLU in establishing the linkages between research, extension and farmers is illustrated in the diagram on the following page.

Because of the clearly stated dependence of the IBRD project and IRA on the TLU concept to interface between researchers, extension workers and farmers, and for the concept to more effectively perform its function with a broader geographic coverage, three additional TLU's will be established in other agro-ecological zones; each staffed with an agronomist and an agricultural economist. The new areas are: (1) Yaounde, which represents the mid-altitude zone and derived savanah zone where farming systems are predominantly shifting cultivation of bush fallow with maize, groundnuts and root crops in mixed systems. (2) Ekona, which represents the low-altitude and humid forest zone, where major farming systems include tree crop plantations such as rubber and oil palm as well as a small-farm production system with maize, banana and root crops. This zone also has potential for the introduction of upland and irrigated rice which are being developed by the NCRE project for the Mbo Plains. (3) Foumbot, which represents the highly populated and intensive food-crop production areas in the Western Province.

These areas were specifically decided upon by USAID, the IRBD and IRA following the recommendations of the project evaluation team and are based on differences in agroclimatic zones, geographic coverage and farming system patterns.

Within the existing framework of the TLU strategy and rational, certain activities will be augmented to further the attainment of original project goals and objectives. This includes the introduction of diagnostic farming-system surveys at selected project areas. These surveys will be jointly conducted by the TLU Extension Agronomists and Agricultural Economists. The surveys will include, but not be limited to:

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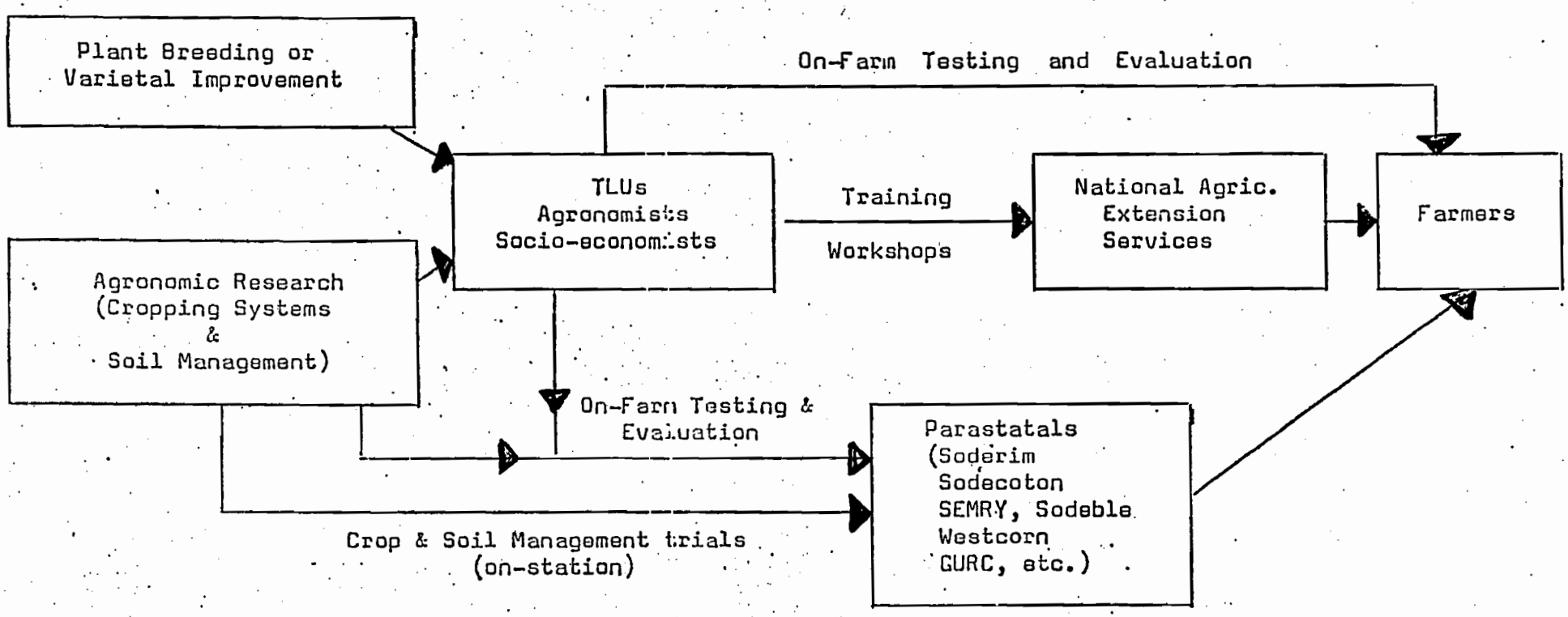
Role of TLUs in Establishing Linkages Between Research, Extension and Farmers



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1. description and analysis of the traditional cereals production systems in relation with other food and cash crops;

2. identification of agronomic constraints such as soil fertility, pests and diseases; and

3. assessment of the opportunities and limitations in existing farming systems. Factors to be considered will include availability of inputs, labor demand, marketing opportunities, etc.

TLU staff will also conduct on-farm testing and evaluation trials in consultation with NCRE and IRA researchers and IITA headquarters. The criteria for choosing variables and technological packages for on-farm trials will be based on the findings of the farming-systems surveys and the available technologies and practices.

B. Additional Technical Assistance - Agronomists

The agronomic problems of cereal production in Cameroon are numerous and complex and cannot be thoroughly addressed by the project's two authorized agronomists for the following reasons:

1. Variations in Cameroon's altitude, latitude, annual rainfall, distribution patterns and soils.

2. The variety of cropping practices such as mixed cropping, double cropping and multiple cropping superimposed with wide diversities in cultural practices such as land preparation, planting methods, weeding, disease and pest control, use of chemicals and fertilizers, and methods of harvesting.

To address these problems the NCRE expansion will provide three additional agronomist positions. This will include a maize agronomist in Yaounde, a maize agronomist in the Northwest Province and a sorghum agronomist in the Extreme North Province. These agronomists will greatly enhance the research of the cereals breeders by determining appropriate planting methods, fertilizer needs, etc. They will also contribute to the extension efforts of the TLU's by conducting more demonstration and field trials and developing extension materials.

C. Extended Technical Assistance and Additional Counterpart Training

In the original design it was planned that the technical assistance team would be replaced by Cameroonians with M.S. degrees. Accumulated evidence pertaining to the performance of recent M.S. and Ph.D graduates has proven that highly qualified expatriate researchers holding Ph.D degrees with many years of experience can only be replaced by Cameroonian counterparts who have equivalent degrees and experience. The original design only allowed a brief period of overlap between the technical assistance team and Cameroonian counterparts trained to the M.S. degree level. Although academic degrees are

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prerequisite to the conduct of sound and comprehensive research programs, such academic training must be closely followed by several years of field experience under the close supervision of veteran researchers.

To address this reality, the training and on-the-job plan provided by this NCRE supplement requires that Cameroonian counterparts work in the field with the technical assistance team for one year, undertake graduate training to the M.S. level, return to Cameroon for an additional one year work experience, return to the U.S. for additional training to the Ph.D level, and then return to Cameroon to work for an additional three years under the guidance of a senior researcher before the departure of their expatriate counterpart. Since some Cameroonian counterparts have already obtained their Ph.D.'s and are presently working with the technical assistance team, and others are presently in the U.S. obtaining their graduate degrees at the M.S. level, it will be possible for some of the technical assistance team to depart as early as June 1986, while others will be required to remain in Cameroon as late as December 1994.

The following list summarizes long-term participant training requirements for the NCRE project activity:

Proposal for Additional Long-Term Participant Training

Status	Degree	Subject	Location
1. To be selected	M.S & Ph.D	Agr. Econ.	Yaounde
2. On-Board	Ph.D	Ext. Agronomy	"
3. "	M.S & Ph.D	Cereal Agronomy	Garoua
4. "	M.S & Ph.D	Sorghum Breeding	Maroua
5. To be selected	M.S & Ph.D	Sorghum Agronomy	"
6. On-Board	Ph.D	Rice Breeding	Dschang
7. "	Ph.D	Rice Agronomy	"
8. "	Ph.D	Maize Breeding	Bamenda
9. "	M.S & Ph.D	Maize Agronomy	"
10. "	M.S & Ph.D	Ag. Economics	"
11. "	Ph.D	Ext. Agronomy	"
12. To be selected	M.S & Ph.D	Ag. Economics	Ekona
13. On-Board	Ph.D	Ext. Agronomy	"
14. To be selected	M.S & Ph.D	Ag. Economics	Foumbot
15. "	M.S & Ph.D	Ext. Agronomy	"

The total long-term participant training program includes 9 M.S. and 15 Ph.D. degrees. Of these 15 participants/counterparts, 10 are already "on-board", or in training, and 5 remain to be selected under the NCRE supplement. Coupled with the two Ph.D's who are already on board, this will total 17 counterparts, complementing entirely the IITA technical assistance team (minus the Chief of Party and the Administrative Assistant).

To address the defined requirements for long-term technical assistance personnel to both undertake specific research activities and serve as supervisory counterparts to the above listed participant positions, a total of nine additional technicians will be added to the original ten-man IITA team. When recruitments are completed, the NCRE/IITA technical assistance team will consist of the following personnel:

Position	Location	Position Status	Termination Date
1. Chief of Party	IRA-Yaounde	Continuing	December 1994
2. Project Admin	" "	"	September 1986
3. Maize Breeder	" "	"	March 1986
4. Maize Agronomist	" "	New (1)	September 1987
5. Sr. Agr. Economist	" "	New (2)	December 1994
6. Sr. Ext. Agronomist	" "	New (3)	September 1990
7. Cereals Agronomist	IRA-Garoua	Continuing	March 1993
8. Sorghum Breeder	IRA-Maroua	"	December 1994
9. Sorghum Agronomist	" "	New (4)	December 1994
10. Rice Breeder	IRA-Dschang	Continuing	September 1991
11. Rice Agronomist	" "	"	March 1990
12. Maize Breeder	IRA-Bamenda	Continuing	September 1992
13. Maize Agronomist	" "	New (5)	December 1994
14. Agriculture Econ.	" "	Continuing	March 1993
15. Extension Agronom.	" "	"	September 1991
16. Agricultural Econ.	IRA-Ekona	New (6)	December 1994
17. Extension Agronom.	" "	New (7)	March 1991
18. Agricultural Econ.	IRA-Foumbot	New (8)	December 1994
19. Extension Agronom.	" "	New (9)	December 1994

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V. AID AND GRC STRATEGY LINKAGES FOR AN EXPANDED NCRE PROJECT

A. Relationship to AID Strategy

AID's Food Sector Assistance Strategy for Sub-Saharan Africa gives priority to planning and policy analysis, increasing farmer participation in decision making, and building institutions - research, training, extension - which provide appropriate technology, information, and inputs for increased productivity. One of the most important components of this strategy focuses on the necessity for AID to make a long-term commitment in building national agricultural research institutions by providing training and technical assistance as well as capital and operating cost support. The strategy statement emphasizes that the nature and magnitude of the task of building national agricultural research systems, and the time required to develop cooperative and complementary programs to produce useful production technologies, requires that external donor assistance be cast in a long-term framework of 10 to 20 years.

The NCRE program's emphasis on the firm development of IRA's institutional capacity to undertake quality adaptive research to meet small-farmer needs in Cameroon, particularly in the area of food crops, is in line with this strategy of long-term assistance to national research systems. This supplement to the original project represents a recognition of the additional time and resources required for AID to be fully responsive to the true magnitude of the tasks to be performed and the long gestation period between investment in research and increases in production.

B. Relationship to Government of Cameroon's Cereals Strategy

The Government of Cameroon's Fifth Plan (1981-1986) acknowledges a strong commitment of resources for the continuation of on-going programs being conducted by IRA with emphasis on food crops. Quality agronomic and farming systems research have been identified as key factors in successful implementation of the country's long-term food production plan. The GRC has placed considerable emphasis on the distribution of multidisciplinary research units throughout the country with coverage of all standard climatic zones in the more densely populated provinces. Existing research units for cereals and food crops will be improved upon and expanded while new ones will be set up. Top priority has been assigned by the GRC to the search for more efficient and appropriate production techniques and the establishment of marketing channels so that national cereals production can be more competitive in the face of imports. GRC agricultural research priorities are right in line with AID's policy objectives and strategy to develop cooperative and complementary programs cast in a long-term assistance framework. The establishment of new TLUs and increased numbers of researchers under this PP Supplement is supportive of and consistent with the GRC's strategy.

C. Relationship to the CDSS

The Fiscal Year 1984 CDSS pinpoints that at the core of Cameroon's emphasis on a balanced development strategy is a clear focus on the rural

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sector, and agriculture in particular. Consistent with this emphasis USAID/Cameroon agrees that the agricultural sector is key to unlocking the long-term development potential of Cameroon and that therein should lie the focus of its development resources

In this context, AID is concentrating its assistance in those areas where the United States has special competencies and particular interests — helping Cameroon to increase food production. Heading the list of requirements to help increase food production in Cameroon is the necessity to develop improved crop varieties and techniques for different ecological zones. The NCRE project activity proposes to eliminate a major constraint to raising food production in Cameroon — the proper adaptation of agronomic research results and applied technology in the various agroclimatic zones in the country. This NCRE Project Paper Supplement reinforces USAID's commitment, as stated in the CDSS, to continue to assist the GRC develop its important institutional entity responsible for carrying out food crop (specifically cereals) research and development activities, including the training of the staff necessary for the GRC to eventually independently continue these activities.

VI. FINANCIAL AND ECONOMIC SUMMARY

A. Financial Summary

Total costs* to extend the life of the project as described above, are estimated at $65,528,000. AID will fund 61.2 percent and the GRC will fund 38.8 percent of these costs. The summary of costs related to the extension of the project is shown below:

USAID	Amount	Percent
Grant Funds	$36,478,000	55.7
Loan Funds	$ 3,605,000	5.5
GRC		
Cash Costs	$25,445,000	38.8
Totals	$65,528,000	100.0

1. USAID FUNDS

(a) Grant Funds: $36,478,000

Table A-2 illustrates the status of expenditures for the current NCRE project. It indicates that an estimated sum of $1,056,250 will be available from the original project authorization to finance the costs related to the existing IITA long-term technical assistance contract between January and December 1985. Consequently, additional grant funds required for the extended project will amount to $35,422,000 (Rounded).

(1) Technical Assistance: $15,262,000

AID will fund 140.25 work years of long-term technical assistance in Cameroon (see annex C, table 1). The total long-term personnel costs are $14,857,000 without allowing for inflation. This includes all salaries and allowances, in-country and international travel costs, vehicle support and contract overhead costs. Salaries and allowances are calculated at a rate of $6,000 per month of long-term personnel. $1,181,000 is allocated for vehicle operating costs over the life of the project and $1,523,000 for international and in-country travel of long-term personnel.

AID will also fund 20 person-months of short-term technical assistance at an estimated cost of $205,000 and 16 work months for evaluations in FY 85, FY 88, FY 91 and FY 95 at an average cost of $50,000 for each evaluation (4 person-months).

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* All costs are given at January 1984 prices. A conversion factor of CFAF 350 - $1.00 has been used throughout.

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(2) Training: $2,303,000

AID will fund training in the United States for 15 participants for ccombined M.S and Ph.D degrees at an estimated cost of $1,251,000 (see annex C, table 2). $504,000 is also budgeted to fund short-term training for technicians mainly in third-countries, and $548,000 for in-country refresher and farming systems courses which will be offered by the Testing and Liaison Units to the Ministry of Agriculture and parastatal field extension workers. Each year approximately 400 extension workers will attend those courses for a period of two weeks.

(3) Commodities: $2,026,000

USAID will fund vehicles, office furniture and equipment, furnishings and appliances, field laboratory and research equipment. See annex C, table 3 for a detailed description and cost break-down. Also, refer to Annex B for detailed procurement plan and waiver requirements.

(4) Other Costs: $3,732,000

Funding in the amount of $657,000 is to be provided to cover about one third of the research costs. AID will also pay for the local costs of pre-extension operations and agro-socio economic surveys ($696,000) to be conducted by the TLUs. Some locally-hired support staff (administrative personnel, drivers, secretaries) will be funded at an anticipated cost of $460,000. A provision of $1,653,000 is included to rent houses during the first two years of the project extension until completion of construction activities, and to maintain existing and new houses.

(5) Contingency: $2,332,000

The provision for contingencies is 10% of above costs.

(6) Inflation: $10,823,000

The inflation factor has been computed at 8 percent for the foreign exchange component of costs, and at 12% for the local currency component. The higher rate for the latter component reflects the assumption that Cameroon's inflation will remain higher than international inflation. Cameroon's internal inflation rate is expected to remain in the vicinity of 15% during the next few years. However, over a ten-year period it has been considered that a 12% rate is, on average, a realistic figure.

(b) Loan Funds: $3,605,000

(1) Construction Costs: $2,666,000

USAID will fund the construction of 12 houses, 485 m^2 of office space and 7 seed laboratory/warehouses. Of the total costs, $242,000 is allocated to A and E services and supervision control, and $2,424,000 to actual construction costs (see Annex D).

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(2) Contingency: $667,000

The provision for contingencies is 25 percent of above costs.

(3) Inflation: $272,000

Inflation is computed at 12 percent and compounded annually.

2. GRC FUNDS

Costs: $25,445,000

(1) Personnel: $6,565,000

Personnel costs include salaries/benefits of participants, incumbents of current positions, and project-created positions. The GRC will assign counterparts and support personnel to the new TA for an estimated total cost of $2,821,000 (see annex C, table 4).

(2) Commodities: $1,060,000

The GRC will purchase 9 vehicles for the project and replace them every three years. This represents 30 vehicles for a total cost of $340,000. The GRC will also supply office furniture and some research and field equipment ($720,000), including one irrigation system at Bambui in FY 1986 and 7 tractors in FY 1990.

(3) Other Costs: $5,971,000

The GRC will fund $2,158,000 of research costs. This includes the purchase of fertilizers, pesticides and other research materials and in-country and international travel costs for the Cameroonian staff. It will provide a lodging allowance for each counterpart and finance maintenance costs of the houses built by AID when they will become available for them after the departure of the IITA advisors ($398,000). The GRC will also pay for all operating costs of existing and new offices and seed laboratory-houses ($685,000), including maintenance costs of equipment as well as vehicles support costs and office supply for counterparts (see annex C, table 5). The cost of transporting imported commodities from the port of Douala to project sites will be borne by the GRC ($35,000).

(4) Inflation: $11,849,000

Inflation is computed at 12 percent and compounded annually.

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Table A.1

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
($ 000)

	USAID				GRC		TOTAL	
	GRANT FUNDS		LOAN FUNDS					
	FX	LC	FX	LC	FX	LC	FX	LC
Technical Assistance	13,043	2,019	-	-	-	-	13,043	2,019
Training	1,755	548	-	-	-	-	1,755	548
Commodities	1,173	853	-	-	-	-	1,173	853
Other Costs	-	3,732	-	-	-	-	-	3,732
Construction	-	-	-	2,666	-	-	-	2,666
Cash Costs	-	-	-	-	-	13,596	-	13,596
Subtotal	15,971	7,152	-	2,666	-	13,596	15,971	23,414
Contingency	1,597	715	-	667	-	-	1,597	1,382
Inflation	5,973	4,743	-	272	-	11,849	5,973	16,864
Evaluations*	327	-	-	-	-	-	327	-
Total Project Costs	23,868	12,610	-	3,605	-	25,445	23,868	41,660

*Including Contingency and Inflation.

Table A.2

CURRENT PROJECT STATUS OF EXPENDITURES OF USAID FUNDS
AND PROJECTION OF EXPENDITURES
($000)

	FY79 - FY81	FY82	FY83	FY84(1)	FY85(1)	FY86(1) 10/1/85 12/31/85	TOTAL
TECHNICAL ASSISTANCE	434	1078	1584	1052	975(2)	325	5448
PARTICIPANT TRAINING COSTS	62	127	96	234	238	-	757
CONSTRUCTION	398	56	33	34	-	-	521
COMMODITIES	-	61	239	509	-	-	809
OTHER COSTS	48	38	66	10	-	-	162
TOTAL	942	1360	2018	1839	1213	325	7697

(1) Estimates.

(2) One quarter of this sum ($243,750) will serve to maintain existing TA on board until December 1984. A remaining sum of $731,250 in FY 85 and $325,000 in FY 86 will be availble to finance project extension.

Table A.3

USAID EXPENDITURES BY FISCAL YEAR - GRANT FUNDED
($000)

	FY85[1] 1/1/85 9/30/85	FY86(1)	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95 10/1/94 12/31/94	TOTAL
TECHNICAL ASSISTANCE												
. Long Term Advisory Services												
- Salaries and Allowances	1026	1332	1224	1152	1152	1116	972	792	612	576	144	10,098
- In Country and International Travel	155	201	185	174	174	168	146	119	92	87	22	1,523
- Vehicle Support	118	158	141	133	133	133	116	91	75	66	17	1,181
. Short Term TA	16	21	21	21	21	21	21	21	21	21	-	205
. Evaluation Team	50	-	-	50	-	-	50	-	-	-	50	200
. Contract Overhead Costs	202	263	244	230	233	227	201	166	133	128	28	2,055
TOTAL Technical Assistance	1567	1975	1815	1760	1713	1665	1506	1189	933	878	261	15,262
PARTICIPANT TRAINING COSTS												
. Long Term, United States	-	286	297	121	209	176	151	11	-	-	-	1,251
. Short Term, Third Country	19	25	35	35	55	55	65	65	75	75	-	504
. Short Term In-Country Training (TLU's)	35	57	57	57	57	57	57	57	57	57	-	548
TOTAL Participant Training	54	368	389	213	321	288	273	133	132	132	-	2,303

(1) Funds available from original authorization

Table A.3 (Cont'd)

	FY85 1/1/85 9/30/85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95 10/1/94 12/31/94	TOTAL
COMMODITIES												
. Vehicles	108	-	-	190	-	-	164	-	-	92	-	554
. Furnishing/Appliances	186	145	-	-	-	124	62	-	-	-	-	517
. Office Furniture/Equipment	130	-	-	53	-	78	-	-	37	-	-	298
. Field, Laboratory and Research Equipment	519	15	15	15	15	15	15	15	15	15	3	657
TOTAL Commodities	943	160	15	258	15	217	241	15	52	107	3	2,026
OTHER COSTS												
. Research Costs	67	82	80	75	75	73	66	52	40	38	9	657
. Extension Costs (TLU'S)	45	72	72	72	72	72	72	72	72	72	3	696
. Local Salaries	35	46	46	46	46	46	46	46	46	46	11	460
. Office Supplies	27	35	32	30	30	30	26	21	16	15	4	266
. Rental Housing and Maintainance	258	324	192	153	153	153	134	105	86	76	19	1,653
TOTAL Other Costs	432	559	422	376	376	374	344	296	260	247	46	3,732
SUB-TOTAL	2996	3062	2641	2607	2425	2544	2364	1633	1377	1364	310	23,323
CONTINGENCY	300	306	264	261	243	254	236	163	138	136	31	2,332
INFLATION	-	281	503	809	1015	1409	1720	1422	1475	1761	428	10,823
TOTAL PROJECT COSTS	3296	3649	3408	3677	3683	4207	4320	3218	2990	3261	769	36,478[1]

(1) Includes $1,056 from original authorization

Table A.4

USAID EXPENDITURES BY FISCAL YEAR - LOAN FUNDED

($ 000)

	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	TOTAL
CONSTRUCTION COSTS												
A/E Design and Supervision Control	123	83	36	-	-	-	-	-	-	-	-	242
Construction Costs	726	1,334	364	-	-	-	-	-	-	-	-	2,424
Subtotal	849	1,417	400	-	-	-	-	-	-	-	-	2,666
Contingency (25%)	212	355	100	-	-	-	-	-	-	-	-	667
Inflation (12% compounded)	-	170	102	-	-	-	-	-	-	-	-	272
TOTAL EXPENDITURES	1061	1,942	602	-	-	-	-	-	-	-	-	3,605

Table A.5

GRC EXPENDITURES BY FISCAL YEAR
($ 000)

	FY85 1/1/85 9/30/85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95 10/1/94 12/31/94	TOTAL
SALARIES												
Senior Personnel	154	206	206	206	206	206	206	270	270	270	68	2,268
Support Personnel	322	430	430	430	430	430	430	430	430	430	105	4,297
Total Personnel	476	636	636	636	636	636	636	700	700	700	173	6,565
COMMODITIES												
Vehicles	34	34	34	34	34	34	34	34	34	34	-	340
Office Furniture	49	-	-	-	-	54	-	-	-	-	-	103
Field and Research Equipment	-	75	25	25	25	361	25	25	25	25	6	617
Total Commodities	83	109	59	59	59	449	59	59	59	59	6	1,060
OTHER COSTS												
Research Costs	154	173	170	222	196	199	212	254	257	257	64	2,158
Rental Housing and Maintenance	19	9	13	32	25	25	38	64	74	79	20	398
Office Supply and Support of Services	143	238	273	270	271	275	287	288	288	288	74	2,695
Operating Costs; Buildings	18	24	78	78	78	78	78	78	78	78	19	685
In-Country Transport of Commodities	23	-	-	6	-	-	-	-	6	-	-	35
Total Other Costs	357	444	534	608	570	577	615	684	703	702	177	5,971
Subtotal	916	1,189	1,229	1,303	1,265	1,662	1,310	1,443	1,462	1,461	356	13,596
INFLATION	-	143	313	525	726	1,618	1,276	1,747	2,158	2,590	750	11,849
TOTAL GRC CONTRIBUTION	916	1,332	1,542	1,831	1,991	2,380	2,586	3,190	3,620	4,051	1,106	25,445

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TABLE A.6

COSTING OF PROJECT INPUTS/OUTPUTS*
($000)

INPUTS	OUTPUTS No. 1	No. 2	No. 3	No. 4	No. 5	TOTAL	Percentage of total Project
USAID GRANT FUNDS							
Technical Assistance	-	6,034	6,742	2,116	170	15,062	23.1
Participant training costs	1,755	-	548	-	-	2,303	3.5
Commodities	-	584	686	99	657	2,026	3.1
Other Costs	-	1,609	1,746	115	262	3,732	5.7
Contingency	176	822	972	233	109	2,312	3.6
Inflation	650	4,036	4,909	764	357	10,716	16.4
TOTAL	2,581	13,085	15,603	3,327	1,555	36,151	55.4
USAID LOAN FUNDS							
A/E Design and Supervision Control	-	-	105	-	137	242	0.4
Construction	-	-	1,050	-	1,374	2,424	3.8
Contingency	-	-	289	-	378	667	1.0
Inflation	-	-	118	-	154	272	0.4
TOTAL	-	-	1,562	-	2,043	3,605	5.6
GRC FUNDS							
Personnel	2,135	2,712	1,585	133	-	6,565	10.1
Commodities	-	197	209	37	617	1,060	1.6
Other Costs	-	3,518	2,051	367	35	5,971	9.1
Inflation	1,896	5,569	3,318	474	592	11,849	18.2
TOTAL	4,031	11,996	7,163	1,011	1,244	25,445	39.0
TOTAL PROJECT INPUTS	6,612	25,081	24,328	4,338	4,842	65,201	100.0
Percentage of total Project	10.1	38.5	37.3	6.7	7.4	100.0	

No. 1. Development of Cameroonian-Staffed Institutional Capacity.
No. 2. Development and Implementation of Research Programs for Maize, Rice, Sorghum and Millet.
No. 3. Establishment of Testing and Liaison Units and their costs.
No. 4. Coordination of Research Programs and Exchange of Information.
No. 5. Adequate Physical Facilities and Equipment for Carrying Out the Cereals Research Program.

* Does not include $327,000 for Project Evaluations.

B. Financial and Recurrent Cost Analysis

1. Identification of the Recurrent Expenditure Implications

Table B.1 and annex 1 detail new costs generated by the project which must be financed by the GRC. Almost all these costs will be of a recurring nature. As shown in table B.1, annual recurring costs to the GRC engendered by the project will more than double between 1985 and 1995. This will represent an increase of $740,000 (without allowing for inflation) or about 6% of total 1983/84 agricultural research expenditure. This increase is attributed to the hiring of additional researchers and support staff, the operating costs of buildings constructed for the project, the maintenance costs of equipment, and other costs of expanded project activities. After USAID's withdrawal, the GRC will take over support and replacement costs of all project equipment as well as the TLUs pre-extension activity costs resulting in an increase in annual recurring costs of an additional $389,000 in constant dollars or 3.0% of total 1983/84 research expenditure. In total, the extended project will therefore engender an increase of 9% in total research expenditures. After the project completion, the TLUs may no longer be linked with IRA. Nevertheless, the role assumed by these structures in establishing the linkage between reseach, extension and farmers will remain an essential component of the research effort regardless of the particular ministry under which they are subsumed. Therefore the TLUs operating costs are considered as a recurrent cost which will have to be supported by the GRC.

2. Assessment of the GRC's Ability to meet Recurrent Costs.

Cameroon's recent economic history displays a record of steady economic growth. Increasing petroleum revenues, a diversified agricultural sector, large investments in development projects combined with continuous political stability and cautious fiscal policies, have enabled it to maintain a five to six percent GDP rate of growth in recent years. Cameroon also has a relatively good balance of payments position and its debt service ratio, which is estimated to have risen in the neighborhood of 15 percent in 1982, is still modest by international standards and at a level which Cameroon can easily absorb. The Government's budgetary revenues have increased significantly in recent years (32.8% in 1982/83 and 26.8% in 1983/84) and have been generated entirely from domestic resources. This no doubt reflects in part the budgetization of a portion of Cameroon's oil revenues. This growth in public revenue is expected to continue during the life of the project.

3. GRC Commitment to the Project

Agriculture remains the focus of the current Fifth Five-Year Development Plan (1981-1986). Cameroon is more than cognizant of the transient, non-renewable nature of its petroleum resources and the concomitant necessity for its developmnent to be firmly based on the agricultural sector and the industrial sub-sectors which other natural resources can competitively sustain (FY 1984, Cameroon CDSS). Oil revenues are expected to dwindle by the mid-1990s at which time agriculture and

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related industry are expected to again become the main source of growth. In the Fifth Plan, the Government acknowledges that: "A considerable effort is necessary to accelerate the development of agronomic research which is also a prerequisite for greater progress in agriculture". In fact, the budget of the Institute of Agronomic Research (IRA) has risen very rapidly in recent years and doubled from 1981/82 to 1983/84 to reach a total of $12.7 million.

Since the execution of the NCRE original project agreement, the GRC has not defaulted on its commitments to the project. It has even exceeded the support stipulated. Indeed, the 1983/84 allocation of researchers and operating funds among agronomic research programs at IRA indicates that the cereals program is now one of the most important within the institution. Before the inception of the project, the emphasis was on estate and cash crops. The TLU in Bambui has proven to be successful and the goverment has formally requested the establishment of 3 additional units. The costs to be generated by an extension of the project have been thoroughly reviewed and accepted by the GRC officials. They are also aware of the fact that the proposed World Bank's Cameroon National Agricultural Research Project will generate an additional 35% increase of total 1983/84 agricultural research expenditure, eight years after project inception. This illustrates the GRC's strong willingness to comply with the Fifth Five-Year Plan's objectives in agricultural research.

4. Conclusion

In view of the high priority assigned to food-crop research, the continuing growth of the economy, the present GRC commitment to the project and the GRC's historical track record in honoring its commitments, it can be safely assumed that additional recurrent and non-recurrent costs to be generated by the project can and will be absorbed by the government.

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Table B.1

GRC PROJECT GENERATED RECURRENT COSTS
AVERAGE PER YEAR
($000)

	FROM 1981-1985	FROM 1985-1995	AFTER USAID WITHDRAWAL
PERSONNEL	364	668	694
BUILDINGS AND HOUSES OPERATING COSTS	24	112	195
OFFICE SUPPLY AND SUPPORT OF SERVICES COSTS (1)	101	352 (2)	446 (2)
RESEARCH COSTS	118	215	272
OTHERS	-	-	129 (3)
TOTAL	607	1,347	1,736

(1) Includes operating costs of vehicles, laboratory, field and office equipment.

(2) Includes depreciation which is not a cash expense, but is budgeted to provide for replacement of vehicles and equipment.

(3) Mainly TLUs' pre-extension activities.

C. Economic Analysis

1. Cost-Benefit Stream and Rate of Return

The economic analysis of agricultural and rural development projects in areas such as agricultural research presents special problems, especially when the objective is to make ex ante analyses as a means of guiding investment decisions. An important inherent difficulty is in knowing how to predict when an insight or discovery will occur, if it will occur, and the time-lag between the development of such technology and its adoption. In order to properly estimate the rate of return of research, one has also to take into consideration the complementary technical inputs and the related marketing and extension costs incurred in order to realize the productivity gains resulting from adoption of the new technology. The existing project provides very little information on those aspects since it has been in operation for only two full years. It is clearly too short a period of time to see gains in terms of production increases emerging from the project. Agricultural research investment takes longer to produce beneficial results than do other avenues of investment. The World Bank and other donors increasingly recognize that a time lag of perhaps a decade is needed between the beginning of research efforts and significant application of proven technology. Results from similar research projects are unavailable for extrapolation since virtually no attempts have been made thus far to estimate the rate of return to agricultural research in Cameroon.

However, as mentioned in the original PP document (see III/1 and Annex H), many studies made from an ex-post perspective to assess the role of agricultural research in economic development and to determine whether investments in such activities are economically viable, confirm that carefully implemented agricultural projects can be an efficient source of economic growth. Since most of those studies have been conducted in developed countries (mainly the U.S.) or in developing countries where institutions, social and agroclimatic environments are different from Cameroon, the conclusions reached cannot necessarily be transposed to Cameroon. However, the studies do tell a consistent story: realized rates of return are much higher and are generally two or three times greater than likely returns from alternative investment opportunites in the countries concerned. Economic returns to research activities in general typically exceed 20% a year and frequently are greater than 40%.

In view of the analysis problems mentioned above, it has not been deemed practical to attempt a refined calculation of the NCRE project's rate of return. However, in order to provide some basis for determining the project's worth, the following approach has been used:

- Assessement of project outputs in terms of potential economic gains.

- Estimation of the benefit stream required to justify the investment in the project.

- Judgement on the feasibility of achieving the required benefit stream.

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- Qualitative evaluation of benefits less easily measured.

(a) Assessment of Project Outputs in Terms of Potential Economic Gains

At the moment, it certainly appears that significant economic gains are to be expected from this project if long-term sustained efforts are followed. Considerable unfilled potential for maize, millet, sorghum and rice production still exists in Cameroon. Yields of maize are about one ton per hectare and sorghum and millet yields in the North average 800 kg per hectare. The NCRE researchers consider that with improved seed varieties, improved cultural practices and fertilization, maize yields of between 2.0 and 2.5 tons per hectare and sorghum and millet yields of 1.2 ton are obtainable with a relatively modest increase in production costs. Maize yields as high as 4.4 tons per hectare and sorghum yields of 6 tons per hectare have even been obtained from the results of on-farm demonstrations. At the present time, Cameroon is self-sufficient in maize and sorghum/millet production, with the equilibrium for each of the two crops being at about 400,000 tons per year. However, Cameroon is expected to move to a position of significantly greater demand by the end of the century. This will be complicated by the growth in urban population and the declining and aging rural population due to rural-urban migration. Maintaining full self-sufficiency for maize is predicted to require increases in yields and/or area cultivated, adding about 25% to the output of small-scale farmers and about 7% for sorghum and millet by the year 2000. The realization of additional production gains would leave a margin for exports to neighboring countries.

Rice consumption is projected to rise significantly from about 80,000 tons in 1983 to about 200,000 tons by the year 2000. The Government does not have a clear program for attaining self-sufficiency in rice production but feels that continuing and even expanding rice production would serve a number of goals. Domestic production (60,000 tons) is derived mainly from a large-scale parastatal enterprise, SEMRY, in the north. Recent evidence has shown, however, that northern rice production is not economically competitive with imports in the main consumption centers in the south. The NCRE project is working in collaboration with smaller-scale parastatal enterprises to develop suitable varieties in Southern Zones. Yields are presently about 4 tons per hectare and future yields of about 6 to 7 tons per hectare are considered obtainable. Nevertheless, a considerable amount of basic research remains to be done in identifying appropriate varieties. Although uncertainty is high, such research may ultimately have the highest pay-off to Cameroon's society and economy. This is a challenge that donors must accept when decisions are required for research project investments.

The Testing and Liaison Unit (TLU) of the project addresses the problems of communication that exist between research, extension services and the farmers. The mechanisms of technology transfer to the farmers have unfortunately often been weak or inefficient in developing countries so that it becomes even more important for researchers to participate actively in the transfer process. The established TLU concept has already proven to be really successful in this aspect and has played a leading role in

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recognizing farmers' problems and the constraints inhibiting increased production. In view of these considerations, it can be safely assumed that the TLU component of the project will have a high economic pay-off. More TLUs will facilitate the adaptation of new technologies to the small farmers' needs and speed its transfer to them, resulting in increased productivity and incomes.

(b) Estimation of the Benefit Stream Required to Justify the Investment in the Project

For the purpose of this analysis it has been assumed that the benefits will be mainly in increments to maize, sorghum, millet and rice production. They are the most dramatic of possible impacts of investments in agricultural research and also the one most easily measured. All the project and related costs have been identified, including the AID contribution, the GRC contribution, the recurrent costs to the GRC as a direct result of the project, and incremental on-farm costs which will have to be incurred as a result of the adoption of the new technology. The first three categories of costs were presented in the financial section of this paper (see tables A.1 to A.5). The incremental on-farm costs include mainly improved seeds costs, fertilizers at a non-subsidized price and labor costs. The period considered is 1981 to 2005. The costs exclude inflation since there is no reason to believe relative prices of outputs and inputs are likely to change. The present value of these costs have been calculated at a discount rate of 12% which reflects Cameroon's opportunity cost of capital (see table C.1). Finally, different assumptions have been made to determine the incremental rate of production growth required to produce a present value of benefits equal to the present value of these costs.

Based upon a simulation of variously possible benefit streams, and employing moderate assumptions concerning the likely range of values obtainable from production benefits, the project should produce an acceptable rate of return under the following assumptions:

- Significant gains in terms of production increases in maize, sorghum, millet and rice will start to emerge a decade after project inception.

- From 1990 to 1995, 10% of areas under maize cultivation will be grown with new varieties and improved technology and increase to 17% between 1995 and 2005. Maize yields will increase from 1 ton per hectare to 2.3 tons per hectare as a result of the adoption of the new technology.

- From 1990 to 1995, 5% of the areas under soghum and millet cultivation will be grown with new varieties and improved technology and 12% between 1995 and 2005. Sorghum/millet yields will increase from 800 kg to 1.2 tons per hectare as the result of the improved technology.

- The project will generate an annual increase in domestic rice production of 9600 tons between the years 1990 and 2005.

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Other possible combinations of production gains could certainly lead to comparable benefits. However, sensitivity analyses have shown that the required gains remain within the same conservative range.

(c) Judgement on the Feasibility of Achieving the Required Benefit Stream

The increases in maize, rice, sorghum and millet production that are necessary to generate an internal rate of return that is at least equal to the opportunity cost of capital in Cameroon are very modest and obtainable given the unfilled production potentials identified above. Without doubt, production gains will in fact be much more important (see PP, 11/9). Part of the additional gains could be attributed to complementary technical inputs and related marketing and extension costs incured in realizing the productivity gains. Nonetheless, the project itself will have generated the necessary technology to be disseminated. Extension cannot be effective unless there are profitable research findings to extend. Moreover, the assumptions set out above do not take into consideration the fact that the TLUs will also contribute to increases in production of other food crops. Although the TLUs will be cereals oriented, they will also participate in the dissemination of other food-crop research results. It therefore can be assumed that returns to the project will be acceptable and may even exceed Cameroon's opportunity cost of capital.

During future project evaluations, the Mission will be in a better position to measure the project's contribution to productivity increases for maize, rice, sorghum and millet production in Cameroon after improved technology becomes progressively more available for dissemination to the farmers. With this view in mind, the NCRE project is presently in the process of conducting a complete survey for the four basic crops in order to establish accurate benchmarks.

The major risk is that the adoption rate will not be as high as expected. The TLUs will certainly contribute to the minimization of this risk. It is nevertheless important to note that a project such as this creates the necessary but not sufficient conditions for realization of the economic benefits ascribed to the project. Many of the factors leading to such gains are not within the project's control. Farmers will adopt new technologies only if they perceive that it is in their economic interest to do so, and if the necessary support services are adequate. While official pricing exists for trade crops, the prices of food crops are set by market forces. Evidence from the Fourth Five-Year Plan shows that production targets were more satisfactorily met for the latter crops. It appears that price formation was efficient and that agriculture was able to respond to growing demand within the existing technological constraints. Based on past experience it can be assumed that market determined incentive prices for the NCRE crops will remain in force. On the other hand, there still exists a general lack of access to production inputs for food crops, while subsidized inputs are available for cash crops. The GRC is presently considering a program for the phased reduction of subsidies on those inputs, and is rethinking present policy on input procurement and distribution. This policy direction will be encouraged by the Mission and will be a covenant in the amended project agreement.

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(d) Qualitative Evaluation of Benefits less Easily Measured

Other socio-economic benefits less easily measured than production gains should also be generated by the project. They should grow out of: (a) effects on income distribution between producers and consumers, (b) effects on employment and nutrition, (c) development of IRA institutional capacity.

Being traditionally produced, maize, sorghum and millet have been and are projected to continue to be produced and consumed by large numbers of people. Increases in production and productivity will therefore have wide-spread benefits for both producers and consumers, and promote social and economic equity. As new technology tends to lower unit costs of production, net incomes of adopting producers can be expected to rise. The net return per man-day of work in cultivating a hectare of maize with improved varieties and cultural practices can be increased by as much as three times compared to that obtained with local varieties and traditional practices. These gains from new technology will in turn accrue to those who consume the commodity. Particularly for commodities such as millet or sorghum which tend to have a low elasticity of demand, any significant increase in output will lower the real price. Since low-income groups spend a larger fraction of their budget on food than do high-income groups, lower sorghum and millet prices will confer disproportionately higher benefits to the poor. Studies by the IBRD and other development specialists also show that the adoption of new technology may have a positive impact on off-farm employment by creating increased demand for non-farm products by the producer. Additionally, the total availability of proteins and calories will very likely have exceeded that which would have prevailed in the absence of high-yielding varieties.

In addition to these general benefits, the project will substantially increase the technical skill level of those Cameroonian scientists and technicians engaged in cereals research and pre-extension activities. When the NCRE project initially began, there were no Cameroonian researchers for sorghum and millet, only 5 for maize and 2 for rice. The number of researchers has now doubled and additional positions will be added. They will receive advanced degree training followed by several years of field experience under the close supervision of researchers. This should enable Cameroonian researchers to successfully continue research activities without assistance after the project will phase out. The development of this research capability is a factor that can not realistically be factored into the long-term rate of return equation but could be one of the most important project contributions.

2. Project Alternatives

Cost-effectiveness discussions are useful in assessing alternative ways in which resources could be expended and to evaluate the relative effectiveness of these expenditures in terms of the stated sector goals of increasing agricultual production and rural development. The main opportunity for achieving the project's goal appears to be an investment to strengthen the agricultural extension system for food crops. Evidence suggests that returns on research are sensitive to the time-lag between the

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development technology and its adoption, a factor that highlights the need to strengthen a country's extension service as its research capabilities expand. Even if some efforts have been made to improve the quality and quantity of Cameroon's extension services, mainly through parastatal organizations which are playing an increasingly active role in food crop production, extension services remain very fragmented and performance is highly variable. In those areas where the Ministry of Agriculture still has responsibility for food crop extension programs, the local agents are generally poorly equipped, underfunded, and still without any food-crop technical packages to extend. Less is known of the returns to investment in agriculture extension but returns to newer extension approaches, such as the Training and Visit System appear to be attractive. Extension is a critical area for involvement and the Mission intends to undertake an initiative in this sub-sector in the near future. Nevertheless, the potential development contribution of research is presently higher and of greater priority. The role of extension will become more important after research has produced the cost-reducing innovations and increased production packages to extend. The NCRE project is therefore the most logical sequence of actions in approaching the sector goal.

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TABLE C.1

COST/BENEFIT ANALYSIS OF NCRE PROJECT
($000)

	FY79-FY 81	FY 82	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88	FY 89	FY 90	FY 91	FY 92
I. COSTS												
A. USAID												
Technical Assistance[1]	434	1,078	1,584	1,052	1,811	1,975	1,815	1,760	1,713	1,665	1,506	1,189
Participant Training	62	127	96	234	292	368	389	213	321	288	273	133
Construction	398	56	33	34	849	1,417	400	-	-	-	-	-
Commodities	-	61	239	509	943	160	15	258	15	217	241	15
Other Costs	48	38	66	10	432	559	422	376	375	374	344	296
Contingency	-	-	-	-	512	661	364	261	243	254	236	163
TOTAL USAID	942	1,360	2,018	1,839	4,839	5,140	3,405	2,868	2,669	2,798	2,600	1,796
B. GRC - PROJECT AND RECURRENT COSTS	4,846	689	689	607	1,074	1,189	1,229	1,303	1,265	1,662	1,310	1,413
C. INCREMENTAL ON-FARM COSTS[2]	-	-	-	-	-	-	-	-	-	8,100	8,100	8,100
TOTAL COSTS	5,788	2,049	2,707	2,446	5,913	6,329	4,634	4,171	3,933	12,560	12,010	11,309
II. ESTIMATED BENEFITS[3]	-	-	-	-	-	-	-	-	-	17,000	17,000	17,000

	FY93	FY94	FY95	FY96	FY97	FY98	FY99	FY00	FY01	FY02	FY03	FY04	FY05
I. COSTS													
A. USAID													
Technical Assistance[1]	933	878	261	-	-	-	-	-	-	-	-	-	-
Participant Training	132	132	-	-	-	-	-	-	-	-	-	-	-
Construction	-	-	-	-	-	-	-	-	-	-	-	-	-
Commodities	52	107	3	-	-	-	-	-	-	-	-	-	-
Other Costs	260	247	46	-	-	-	-	-	-	-	-	-	-
Contingency	138	136	31	-	-	-	-	-	-	-	-	-	-
TOTAL USAID	1,515	1,500	341	-	-	-	-	-	-	-	-	-	-
B. GRC - PROJECT AND RECURRENT COSTS	1,462	1,461	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736	1,736
C. INCREMENTAL ON-FARM COSTS[2]	8,100	8,100	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600	13,600
TOTAL COSTS	11,077	11,061	15,677	15,336	15,336	15,336	15,336	15,336	15,336	15,336	15,336	15,336	15,336
II. ESTIMATED BENEFITS[3]	17,000	17,000	28,100	28,100	28,100	23,100	28,100	28,100	28,100	28,100	28,100	28,100	28,100

(1) Some of the costs related to the presence of the long-term technical assistance are included in line item "other costs", after 1985.
(2) Improved seeds, fertilizer, pesticides, incremental labor costs, interest on capital.
(3) Based on the assumptions mentioned in section VI.C.

Net present value of costs using a discount rate of 12% = $55,934,000

Net present value of estimated benefits " " = $56,239,000

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VII. CONSTRUCTION SUMMARY

A detailed engineering/construction analysis requires certain basic data: (1) a site map showing topography, access roads, existing buildings, proposed buildings and future plans for construction; (2) preliminary plans for proposed buildings and structures in sufficient detail to permit a reasonably firm estimate of quantities, materials, construction techniques and costs; and (3) preliminary architectural and structural drawings. For the construction planned under this project, general site locations are known but specific locations have not yet been determined and much of the above listed requirements are only partially available or not available. For example, there are drawings for houses being constructed under the original PP authorization but no site plans or drawings are available for the proposed laboratories and offices. Therefore, actions are underway to identify which data remains to be collected, which activities must be pursued prior to construction and likely schedules and costs based on more readily available information. Because of the low level of detailed information available, and because of the amount of time that would be required to collect synthesize and assess the additional requirements, an A/E firm will be contracted to collect the data as early as possible and proceed with preparation of plans and specifications that will permit more detailed estimates and provide a basis for the preparation of contract documents. In the meantime, a construction contingency of twenty five percent has been applied to overall construction cost to cover any unforseen cost factors. See Annex D for the detailed construction program and schedule of activities.

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VIII. IMPLEMENTATION ARRANGEMENTS

A. Implementation Plan

The basic project strategy remains the same as that stated in the original project paper. The geographic areas of focus have been expanded to include additional Testing and Liaison Units (TLUs) located at Nkolbisson, Ekona and Foumbot. These new units will build upon a substantial base of knowledge and experience gained from the initial TLU activity located at Bamenda. This project paper supplement will extend the current technical assistance, training and other support components to continue current research activities over a 10-year extension in the life of project implementation plan.

The core administrative, coordinating and decision making body for the extension of project activities will continue to be IRA/NCRE with the IRA Director having final approval authority for all matters concerning GRC policy, budgetary support and institutional commitment. There will be no major shifts in the primary focus of the NCRE activity for this extension effort. Key implementation resources will remain intact and those researchers and administrative officials having "vested interests" in the NCRE project will remain responsible for coordinating and managing implementation and the continued flow of additional NCRE resources and inputs. IRA will play the key role in identifying counterpart researchers and participants for long-term training opportunities provided by the project. See Annex F for a comprehensive schedule of training and technical assistance activities to be performed over the 10 year life of project extension.

B. Procurement Plan

See Annex B.

C. Payment Methods and Implementation of Financing

Method of Implementation	Method of Financing
TA - Non-profit Contractor	FRLC
- Institutional Contract	Direct Pay
- Personal Services Contract	" "
Training	
- S&T/IT	Direct Pay
- Placed by Mission in Host Country	" "
Commodities	
- Purchase Order	Direct Pay
- Procurement Agency Contracts	Direct Letter of Commitment

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Construction	
- Residences	F.A.R.
- Host Country Institutional Contract	Direct Pay
Other Costs	
- Purchase Orders	Direct Pay

Justification for departure from the three preferred financing alternatives:

Because of the complexities of various procurements it has been considered advisable to use a procurement agent. This procedure requires the issuance of direct letters of commitment. All payment documents are reviewed in AID/W and at the USAID/Cameroon Mission.

The Host Country Institutional Contract under the construction category is for architectural and engineering services. Therefore the FAR method does not apply.

D. USAID Monitoring and Evaluation Arrangements

1. Project Management: The USAID/Cameroon Agricultural and Rural Development (ARD) division will continue to have overall responsibility for the management and control of all technical aspects of the NCRE Project. Close liaison will be maintained with the GRC/IRA to assure effective project implementation progress for the technical assistance, training and commodity/equipment procurement elements of the expanded NCRE activity.

The ARD agricultural research project officer will continue to direct and coordinate the flow of resources and inputs programmed for the NCRE Project. Responsibilities for the project officer will also include the review and approval of annual work plans proposed by the project's technical assistance contractor, IITA, and also approval of the IRA training plan for both short-term and long-term project funded participant training. The ARD project officer will also work directly with the USAID Project Development and Evaluation Office (PDE) to plan and program all NCRE project evaluations. Additionally, the agricultural research project officer will liaison with the USAID Supply Management Division (SMD) to ensure the prompt procurement of project vehicles, equipment and other supplies required to support the long-term NCRE cereals research effort in Cameroon.

USAID will also assist GRC/IRA with the coordination and monitoring of loan financed construction activities. The USAID general engineering officer will review and approve all architectural/engineering and construction schedules, contracts, and implementation progress reports as outlined in Annex D of this Project Paper Supplement.

2. Financial Management: The USAID Controller will review and approve all disbursement/reimbursement requests for conformity with AID payment methods and implementation of financing regulations, and will also ensure that adequate financial controls are followed.

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3. Evaluation: Progress checks will be made throughout the course of the expanded NCRE project activity to ensure that the program is accomplishing what is expected and keeping to the anticipated pace. Project resources have also been provided for four major evaluations which will call upon the services of outside consultants/experts to evaluate the NCRE activity with GRC/IRA officials, contract personnel and USAID project management staff. Evaluation objectives for the expanded NCRE project will follow along the lines of those already identified in the existing activity with cereal crop harvest times and cropping seasons being used to determine the scheduling of in-depth project evaluations. It will be critical that benchmarks be established by IITA researchers early to measure the project's contribution to increased productivity of maize, rice, sorghum and millet. Also, for the evaluations to be effective, reliable data will have to be collected on Cameroonian IRA staff, their educational levels, supporting personnel, research and other physical facilities, research accomplishments including varieties released or at least identified, and the extent to which the research accomplishments constituted improvements.

Comprehensive in-depth evaluations have tentatively been scheduled for FY 1985, FY 1988, FY 1991 and FY 1995.

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A N N E X E S

Best Available Document

Project: National Cereals Research and Extension (Project Paper Supplement)

Date: April 1984

Project Number: 631-0013

REVISED LOGICAL FRAMEWORK MATRIX

ANNEX A

NARRATIVE SUMMARY	'OBJECTIVELY VERIFIABLE INDICATORS'	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Goal: Increasing agricultural production and rural development.	Measures of Goal Achievement: 1. Increases in food crop production. 2. Increased rural incomes.	Goal: 1. GRC statistics, USAID-financed agricultural census and results of baseline study. 2. Economic survey of TLUs.	Goal Assumptions: 1. a) GRC developmental and budget priorities continue to stress agricultural production/rural development b) Sufficient inputs and credit are available for food crops. c) Precipitation remains normal. 2. Implementation agencies continue to coordinate efforts to maximize effectiveness.
Subgoal: Building an institutional capacity for applied agricultual research.	Measures of subgoal achievement: 1. Agricultural research institutions conduct research programs. 2. Institutions staffed with trained Cameroonians.	Subgoal: 1. Research Institution reports and periodic evaluations. 2. GRC records and periodic evaluations.	Subgoal Assumptions: 1. That adequate human and financial resources continue to be provided to agricultural research. 2. That other donors provide sufficient assistance to other aspects of agricultural research.
Project purpose: To develop Cameroonian institutional capacity to provide quality research on maize, rice, millet and to facilitate utilization of research results by farmers. Cereals research will be integrated into a cropping systems approach to food production and be aimed at the problems of farmers.	Conditions that will indicate purpose has been achieved EOPS: 1. Cereals research program fully implemented without external assistance after December 1994. 2. Produces research results relevant to problems faced by food crop producers and parastatal enterprises.	1. Research institution records and periodic evaluations. "	1. That sufficient number of Cameroonians are trained. 2. That GRC continues to place very high priority on cereals research.

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NARRATIVE SUMMARY	'OBJECTIVELY VERIFIABLE INDICATORS'	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	3. Meshing cereals research with research on other food and perennial crops to develop cropping systems recommendations for each agroclimatic region.	"	3. That socio-economic analyses closely tie in with agronomic research and continue to be taken into account in designing research programs.
	4. Establishment of linkages: a) With other national and international agricultural research centers. b) With implementing agencies/institutions in Cameroon.	"	4. a) That results of field tests continue to be taken into account in designing future research. b) That various ministries and institutions will coordinate research and work together on design and testing of extension practices.
	5. Establishment of adequate physical facilities for cereals research.	5. GRC records and site surveys.	5. That land be made available for research; construction completed as planned, and that maintenance and spare parts continue to be available.
Outputs:	Magnitude of Outputs:		Assumptions of Outputs:
1. Development of Cameroonian staffed institutional capacity to conduct applied national cereals programs.	1. Cereals research staff including 18 researchers with Ph.D degrees by 1985.	1. GRC and USAID records.	1. Personnel can be released for training and once trained remain attached to IRA.
2. Development and implementation of research programs for maize, rice, sorghum and millet including field trials demonstrations on farmers' field.	2. Research Programs: a) Long-term maize, rice, soghum, and millet research plan 1981. b) Begin implementation of research programs on stations starting in 1982.	2. GRC and research institutions records.	2. Coordination between IRA and agencies utilizing research results; sufficient staff available; and funds available for operations.

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NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
3. Development and operation of Testing and Liaison Units (TLUs): to transmit agronomic research results to extension agencies and farmers' problems to the researchers and to determine economic and social consequences of agronomic research.	3. Testing and Liaison Units: a. Establish first unit 1981 and 3 additional units in 1985. b. Begin designing field tests 1981. c. Analyse results 1982. d. Research results released when high yielding, stable and diseases resitant varieties are obtained. e. Farmer field trials executed and extension packages are distributed.	3. GRC research institution records, field survey.	3. The extension services of the Ministry of Agriculture and the parastatal organizations collaborate with the TLUs.
4. Establish and maintain an exchange of information with international, African and Cameroonian institutions conducting agronomic and socio-economic research.	4. Continuous contact with institutions by FY 1981.	4. GRC, USAID records.	4. The Technical Assistance team and Cameroonian counterparts actively coordinate an exchange of information.
5. Adequate physical facilities and equipment for carrying out the cereals research program.	5. Adequate facilities for research in various distintive ecological zones: a. land b. buildings c. farm equipment d. laboratory equipment	5. GRC records and evaluation.	5. GRC makes land, planting materials and buildings available.
Inputs:	Magnitude of Inputs: ($79.2 million):		Inputs Assumptions:
1. AID a. Personnel: long-term contract advisor b. Participant training c. Commodities d. Construction e. Other Costs	1. AID ($46.8 million) a. Personnel ($19.7 million) Long-term advisor, 175 work years; b. Participants ($3.1 million) c. Commodities ($2.8 million) d. Construction ($3.2 million) e. Other Costs & Inflation/ Contingencies ($18.0 mil.)	1. USAID records, evaluations.	1. That adequate funds are made available.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
2. Host Country a. Personnel b. Land c. Other Costs d. Equipment e. Buildings	2. Host Country ($32.4 million) a. Personnel (salary) $7.7 million) b. Land and Buildings ($4.8 million) c. Other Costs ($8.1 million) d. Contingencies/Inflation ($11.8 million)	2. GRC records and evaluations.	2. That GRC continues to make funds available on timely basis.

ANNEX B

DETAILED PROCUREMENT PLAN AND WAIVERS

1. Responsibilities

Project procurement and contracting will be accomplished in several ways, depending upon the commodities or services to be procured.

USAID/Cameroon will act on behalf of the GRC for contracting technical assistance. This will be done through an amendment to the contract with the International Institute for Tropical Agriculture, extending the services of the present technical assistance team.

2. Source/Origin

Goods and Services financed by AID under the grant, will have their source and origin in the United States and the Cooperating Country, except as AID may otherwise agree in writing. Ocean shipping financed by AID under the grant shall, except as AID may otherwise agree in writing, be financed only on flag vessels of the United States or when shipment is under a through bill of lading issued by a U.S. flag carrier.

3. Commodity Eligibility

For purposes of this project, items procured in the host country and Cameroon having their verifiable origin in the United States will be considered of U.S. source and eligible for financing. Such procurement will be done in accordance with good commercial practices and AID regulations.

All commodities listed are eligible for AID financing.

4. Shelf Items

Imported shelf items having their origin in the United States Geographic Code 000 can be purchased without restrictions, except for the limitation on the total amount available for local procurement. Shelf items having their origin in Geographic Code 941 countries are eligible for local cost financing in unlimited quantities, save for the limit on local procurement funding. Shelf items having their origin in any country included in Code 899 but not in Code 941 are eligible if the price of one unit does not exceed $5,000. For goods sold by units of quantity, e.g., tons, barrels, etc., the unit to which the local currency equivalent of $5,000 is applied is that which is customarily used in quoting prices. The total amount of imported shelf items purchased from countries included in Code 899 but not in Code 941 may not exceed $25,000 or 10% of the total local costs financed by AID for the project, whichever is higher; however, in no case will the total amount of such purchases exceed $250,000 without first obtaining a specific geographic source waiver. Procurements in excess of the limits will be authorized only as source waivers in accordance with the provisions and limitations of Africa Delegation of Authority No. 140, Revised, and any redelegation thereunder.

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Imported shelf items produced in or imported from countries not included in Geographic Code 899 are ineligible for AID financing.

Procurement of imported shelf items shall conform to good commercial practices, shall be at reasonable prices, and shall not be in a manner which conflicts with local laws and practices.

Shelf item procurement procedures must be spelled out carefully in the Implementation Letter(s) so there will be no confusion on the part of the GRC as to what type of items are authorized to be procured.

5. Delivery and In-Country Transport

All commodities imported specifically for the project will be shipped CIF Douala. In-country transport and insurance will be the responsibility of and paid for by the GRC. Suppliers will provide all risk marine insurance in the amount of 120% of the CIF of the commodities. AID's marking requirements for overseas shipments will be enforced.

6. Title of Commodities

Commodities imported under the project will be titled to the Ministry of Agriculture.

7. Custom Clearance

It is the responsibility of IRA to initiate documentation required for customs exoneration prior to the arrival of goods in Douala and to assure that such documentation is made available to the freight forwarder insufficient time to permit goods to be moved from port of entry promptly upon arrival.

USAID does not pay transportation costs beyond port of entry in Cameroon. The IRA is responsible for issuing an Order of Transit to its predetermined freight forwarder promptly upon commodity arrival to move such commodities out of the port of entry to its warehouse facilities and on to the appropriate project site.

8. Condition of Goods upon Arrival

It is the responsibility of IRA to inspect goods upon arrival and report to the IITA technician and USAID/Yaounde, immediately thereafter, any shortages or damages so that appropriate insurance claim(s) can be initiated. In the event significant shortages or damages are encountered IRA will employ the services of an independent surveyor to prepare and submit a written report.

9. Receipt and Utilization

IRA is responsible for the proper reception and clearances of incoming project commodities. Inspections of incoming shipments must be made, and receiving documents shall be annotated with comments on evident or possible damages/losses.

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Reports of damages/losses must be made promptly; if incoming cargo has been procured in the United States, the contractor must file a claim against the ocean carrier or freight forwarder(s) involved. Once the contractor has filed its claim, the carrier must await the filing and adjudication of the claim to permit IRA to acquire more information and particulars about the claim. In most cases where damages or losses are noted, a picture of the damaged commodity and/or its container is the best possible evidence to be presented. Receiving documents properly annotated, are valuable. If damages or losses are not noted on the documents, however, there would be little or no possibility of having a claim settled.

IRA is required to put into project use all commodities procured for the project within one (1) year of receipt; USAID/Cameroon will inspect IRA's utilization reports as a matter of course.

10. Commodity Summary

The following is a summary of commodities expected to be procured for project implementation. This list may be revised as necessary by the Contractor in collaboration with IRA and USAID/Cameroon.

All prices shown (with the exception of local procurement) are CIF Douala.

1. Vehicles: Estimated cost: 4WD $16,000 ea. station wagon $10,000 ea.

FY	4-wheel-drive	station wagon	Cost
85	3	6	$108,000
88	5	11	190,000
91	4	10	164,000
94	2	6	92,000
TOTAL	14	33	$554,000

2. Furnishings and Appliances:

Estimated Cost including transportation $20,676 per set.

FY	No. of Sets	Cost
85	9	$186,084
86	7	144,732
90	6	124,056
91	3	62,028
TOTAL	25	$517,000

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3. Office furniture and equipment cost estimate:

Typewriter	$ 1,500 ea.
Copy machine	10,000 ea.
Air conditioner	1,000 ea.
Office furniture	3,000 set

FY	Typewriter	Copy Machine	Air Cond	Office Furn.	Cost
85	5	5	18	18	$129,500
88	1	2	8	8	53,500
90	4	4	8	8	78,000
93	3	2	3	3	36,500
TOTAL	13	13	37	37	$297,500

4. Lab and research equipment

Equipment	Quantity		Price	Total Price estimate
Tractors and spare parts	7	X	$32,000	$224,000
Ohaus No. 310 Scales	14	X	100	1,400
Ohaus No. 162 Scales	14	X	150	2,100
Toledo Grain Scales	7	X	1,100	7,700
Hand Operator Maize Shellers	15	X	80	1,200
Seed Cleaners	5	X	200	1,000
Seed driers (locally constructed	5	X	1,000	5,000
Dehumidifiers	7	X	250	1,750
Maize Hand Planters	40	X	50	2,000
Maize Rolling Injection Planters	7	X	200	1,400
Rototiller (to be purchased locally)	2	X	2,000	4,000
Programmable Calculators	11	X	175	1,925
Digital Moisture Meters	4	X	1,500	6,000
35mm Cameras	2	X	300	600
Slide Viewer	2	X	400	800
Miniature Weather Equipment	2	X	3,000	6,000
Radios	2	X	7,200	14,400
Miscellaneous equipment (Tool sets, metal tape measure, husking pins, etc.)				5,000
Pathology lab equipment, Nkolbisson				20,000
Soils lab. equipment, Maroua				20,000
Entomology lab. equipment, Nkolbisson				20,000
Transportation				173,137
Other equipment between FY 86 and FY 94				138,000
Total cost for lab. and research equipment				$657,412

Commodity Summary:

Vehicles	$ 554,000
Furnishings and appliances	517,000
Office Furniture and equipment	297,500
Lab. Research Equipment	657,412
Total Cost	$2,025,912

Waivers: (See Attachments I and II)

1. Source/origin waiver is requested for:

   Six two-wheel drive station wagons $60,000

2. Proprietary procurement waiver is requested for:
   Three four-wheel drive AMC utility vehicles $48,000

NOTE: Waivers were requested only for those vehicles which will procured during Fy 85. Future vehicle requirements will be periodically reviewed and decisions will be made based on project requirements and the availability of maintenance and spare parts support in Cameroon.

11. Procurement Schedule

This Procurement Schedule is based from the date of signing of the Project Paper Amendment. The schedule is only for those commodities which will be procured during FY 1985. Subsequent procurement schedules will be prepared after detailed review of the requirements.

Target Dates	Action(s) to be taken
+ 30 days	Designate and appoint Authorized Agent(s) to do the procurement of U.S. and non-U.S. manufactured commodities. (USAID/ARD and SMD, IITA, IRA)
+ 45 days	PIO/Cs prepared (USAID/SMD)
+ 60 days	Advertising for U.S. source commodities (Authorized Agent) Procurement of non-U.S. source equipment initiated (Authorized Agent)
+ 120 days	Bids for U.S. source commodities received and evaluated (Authorized Agent)
+ 135 days	Awards made and Purchase Orders issued (Authorized Agent)
+ 180 days	All non-U.S. source commodities delivered to the project sites (IRA).
+ 360 days	Arrival of all U.S. source commodities in Cameroon. Processed through customs (IRA) Delivered to project sites (IRA)

Attachment I

Problem: Your approval is requested for a procurement source/origin waiver from Geographic Code 000 (U.S. only) to Geographic Code 935 (Special Free World).

Cooperating Country	Cameroon
Authorizing Document	Project Authorization
Project	National Cereals Research and Extension (631-0013)
Nature of Funding	Grant
Description	Six two-wheel drive station wagons
Approximate Source	$60,000
Probable Source	Cameroon
Probable Origin	Western Europe

Discussion: The purpose of this project is to develop the institutional capacity to provide high-quality research on maize, rice, sorghum and millet, as well as to develop efficient transmission of the research results to the farmer. To carry out these tasks in an efficient manner the project technical assistance team requires reliable vehicles which can be maintained and serviced locally.

Justification: The requested two-wheel drive station wagons will be for the use of the technical assistance team members who are stationed in areas where there is no requirement for four-wheel drive vehicles. The only dealer in Cameroon handling U.S. made vehicles is Renault-Cameroon which offers only four-wheel drive AMC vehicles. This type of vehicle is not suitable for the project puposes because of high initial cost, low gas mileage and high operating costs. Two-wheel drive vehicles are approximately 40% less expensive than four-wheel drive vehicles. Other U.S. manufactured vehicles have no dealerships in Cameroon and there are no maintenance and spare parts support available locally. Based on the criteria in AID Handbook I, supplement B, Chapter 5B4 (a) (2), the commodity is not available from countries or areas included in the authorized geographic code. Section 636 (i) of the Foreign Assistance Act of 1961, as amended, provides that none of the funds made available to carry out the Act shall be used to procure motor vehicles unless such motor vehicles are manufactured in the United States. However, when special circumstances exist, AID Hnadbook 1, Supplement B, Chapter 4, Paragraph 4C2d, provides that the provisions of Section 636 (i) may be waived in order to carry out the provisions of the Act. Such circumstances include a present or projected lack of spare parts or adequate service facilities for U.S. manufactured vehicles. No Code 000 vehicles of the type required are sold or serviced in Cameroon.

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Recommendation: Based upon the above it is recommended that you:

1. Certify that exclusion of procurement from free world countries other than the cooperating country and countries included in Code 941 would seriously impede attainment of U.S. Foreign Policy objectives and objectives of the Foreign Assistance Program.

2. That you further certify that special circumstances exist to waive the requirements of Section 636 (i) of the FAA to permit this procurement.

3. That you authorize the procurement of the six two-wheel drive station wagons from Code 935 sources.

Attachment II

Problem: Your approval is requested to permit the procurement of three AMC jeep type 4-wheel drive utility vehicles on a proprietary basis.

Cooperating Country	Cameroon
Authorizing Document	Project Authorization
Project	National Cereals Research and Extension 631-0013
Nature of Funding	Grant
Description	3 AMC type 4-wheel drive utility vehicles
Approximate Value	$48,000
Probable Source	Cameroon
Probable Origin	U.S.A.

Discussion: The purpose of this project is to develop the institutional capacity to provide high-quality research on maize, rice, sorghum and millet, as well as to develop efficient transmission of the research results to the farmer. To carry out these tasks in an efficient manner project technical assistance team requires reliable vehicles which can be maintained and serviced locally.

Justification: AID Handbook 15 Chapter 3, Section 3b(7) permits a waiver of the rule regarding nonrestrictive specifications of equipment and materials and thereby allow proprietary procurement when substantial benefits such as economics in maintenance of spare parts inventories, better repair facilities, or greater familiarity by operating personnel can be achieved, through standardizing on a particular brand. The only U.S. manufactured 4-wheel drive vehicles which can be supported in the project area are AMC jeep type vehicles. Renault-Cameroon has fully equipped service facilities for AMC vehicles in Douala and Yaounde. Renault-Cameroon also has trained mechanics and is able provide spare parts and maintenance support. There are no other U.S. manufactured vehicle dealers in Cameroon.

Recommendation: For the above reasons it is recommended that you approve a propriety procurement waiver authorizing the procurement of three AMC jeep type utility vehicles.

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FINANCIAL ANALYSIS

Table I

LONG TERM TECHNICAL ASSISTANCE
MAN YEARS

	FY85(1)	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95(2)	TOTAL
Long-term Contract Advisor												
Chief of Party	.75	1	1	1	1	1	1	1	1	1	.25	10
Administrative Officer	.75	1	-	-	-	-	-	-	-	-	-	1 .75
Maize Breeder	1.5	1.5	1	1	1	1	1	1	-	-	-	9
Maize Agronomist	1.5	2	2	1	1	1	1	1	1	1	.25	12.75
Rice Breeder	.75	1	1	1	1	1	1	-	-	-	-	6.75
Rice Agronomist	.75	1	1	1	1	.50	-	-	-	-	-	5.25
Sorghum Breeder	.75	1	1	1	1	1	1	1	1	1	.25	10
Sorghum Agronomist	.75	1	1	1	1	1	1	1	1	1	.25	10
Cereals Agronomist	.75	1	1	1	1	1	1	1	.50	-	-	8.25
Extension Agronomist	3	4	4	4	4	4	2.5	1	1	1	.25	29
Agricultural Economist	3	4	4	4	4	4	4	4	3.	3	.75	37.75
TOTAL	14.25	18.5	17	16	16	15.5	13.5	11	8.5	8	2.00	140.25

(1) 9 months
(2) 3 months

Table 2

LONG TERM PARTICIPANTS TRAINING

Obligation of Funds ($000)

M.Sc. Followed by Ph.D.*	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95
Extension Agronomist (4)	88	88	22	22	22	22	-	-	-	-
Agricultural Economist (4)	77	77	12	88	77	63	-	-	-	-
Cereals Agronomist (1)	11	11	22	22	11	-	-	-	-	-
Sorghum Breeder (1)	22	22	11	11	22	22	11	-	-	-
Sorghum Agronomist (1)	22	22	-	22	22	22	-	-	-	-
Rice Breeder (1)	22	22	22	-	-	-	-	-	-	-
Rice Agronomist (1)	22	11	-	-	-	-	-	-	-	-
Maize Breeder (1)	-	22	22	22	-	-	-	-	-	-
Maize Agronomist (1)	22	22	-	22	22	22	-	-	-	-
TOTAL (15)	286	297	121	209	176	151	11	-	-	-

( ) number of participants

* Cameroonian Counterparts will work with the technical assistance for one year, leave to the U.S. for graduate training to the M.Sc. level, return to Cameroon for one year, leave again to the U.S. for additional training to the Ph.D. level. Training costs in FY 85, from original authorization:

Table 5

COMMODITIES AND OTHER COSTS
GRC CONTRIBUTION
($000)

	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95
COMMODITIES											
30 Vehicles	34	34	34	34	34	34	34	34	34	34	-
34 Sets - Office Furniture	49	-	-	-	-	54	-	-	-	-	-
Field and Research Equipment											
- 1 Irrigation system	-	50	-	-	-	-	-	-	-	-	-
- 7 Tractors	-	-	-	-	-	336	-	-	-	-	-
Others (1)	-	25	25	25	25	25	25	25	25	25	6
Total Commodities	83	109	59	59	59	449	59	59	59	59	6
OTHER COSTS											
Research Costs	154	173	170	222	196	199	212	254	257	257	64
of which in-country and international travel for counterparts	39	20	16	68	42	46	59	101	104	104	26
Rental housing and maintenance (2)	19	9	13	32	25	25	38	64	74	79	20
Office supply and support of services	143	238	273	270	271	275	287	288	288	288	74
- Existing Costs	76	101	101	101	101	101	101	101	101	101	25
- New Costs	67	137	172	169	170	174	186	187	187	187	49
Maintenance costs of office, laboratory and field equipment	-	20	20	20	20	20	20	20	20	20	5
Vehicle support costs	45	85	110	110	110	110	110	110	110	110	28
Office supply for counterparts	4	5	15	12	13	17	30	30	30	30	7
Others	18	27	27	27	27	27	27	27	27	27	9
Operating costs - Buildings:	18	24	78	78	78	78	78	78	78	78	19
- Existing Costs	18	24	24	24	24	24	24	24	24	24	6
- New Costs	-	-	54	54	54	54	54	54	54	54	13
In-Country Transport of Commodities	23	-	-	6	-	-	-	6	-	-	-
Total Other Costs	357	444	534	608	570	577	615	684	703	702	177

(1) Replacement of the equipment financed by AID in 1985 and purchase of additional needed equipment.

(2) Lodging allowance or rented houses for each counterpart before the departure of the TA. and maintenance costs of the 18 houses gradually made available to the GRC after the departure of the TA.

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Table 4

GRC PERSONNEL EXPENDITURES
($ 000)

	FY85	FY86	FY87	FY88	FY89	FY90	FY91	FY92	FY93	FY94	FY95	TOTAL
SENIOR PERSONNEL*												
Nkolbisson (4)	34	45	45	45	45	45	45	60	60	60	14	498
Garoua (1)	9	12	12	12	12	12	12	15	15	15	3	129
Maroua (2)	17	23	23	23	23	23	23	30	30	30	8	253
Bamenda (5)	43	57	57	57	57	57	57	75	75	75	19	629
Ekona (2)	17	23	23	23	23	23	23	30	30	30	8	250
Foumbot (2)	17	23	23	23	23	23	23	30	30	30	8	253
Dschang (2)	17	23	23	23	23	23	23	30	30	30	8	253
Total Senior Personnel (18)	154	206	206	206	206	206	206	270	270	270	68	2268
SUPPORT STAFF												
Existing Staff	196	261	261	261	261	261	261	261	261	261	65	2610
New Staff	126	169	169	169	169	169	169	169	169	169	40	1687
- Research Assistants (B.Sc.)	42	56	56	56	56	56	56	56	56	56	13	559
- Intermediate Assistants	32	43	43	43	43	43	43	43	43	43	9	428
- Laboratory Assistants	19	26	26	26	26	26	26	26	26	26	7	260
- General Field Workers	13	18	18	18	18	18	18	18	18	18	5	180
- Others (Drivers, Typists, etc.)	20	26	26	26	26	26	26	26	26	26	6	260
Total Support Staff	322	430	430	430	430	430	430	430	430	430	105	4297
TOTAL	476	636	636	636	636	636	636	700	700	700	173	6565

( ) number of counterparts.

* The GRC has agreed to provide counterparts for the 18 long-term TA and to continue to pay salaries for all Cameroonians sent abroad by the project for study.

Table 3

COMMODITIES
FY obligations ($000)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Vehicles											
33 Cars	60.0	-	-	110.0	-	-	100.0	-	-	60.0	-
14 Four-Wheel Drive Vehicles	48.0	-	-	80.0	-	-	64.0		-	32.0	-
Total	108.0	-	-	190.0	-	-	164.0	-	-	92.0	-
Furniture and Apllicances											
25 Sets	186.1	144.7	-	-	-	124.1	62.1	-	-	-	-
Office Furniture and Equipment											
13 Typewriters	7.5	-	1.5	6.0	-	-	-	-	4.5	-	-
13 Xerox Machines	50.0	-	20.0	40.0	-	-	-	-	20.0	-	-
37 Air Conditioners	18.0	-	8.0	8.0	-	-	-	-	3.0	-	-
37 Office Furniture	54.0	-	24.0	24.0	-	-	-	-	9.0	-	-
TOTAL	129.5	-	53.5	78.0	-	-	-	-	36.5	-	-
Field, Research and Laboratory Equipment											
7 Tractors and Spare Parts	224.0	-	-	-	-	-	-	-	-	-	-
14 Ohaus No 310 Scales	1.4	-	-	-	-	-	-	-	-	-	-
14 Ohaus No 162 Scales	2.1	-	-	-	-	-	-	-	-	-	-
7 Toledo Grain Scales	7.7	-	-	-	-	-	-	-	-	-	-
15 Hand Operator Maize Shellers	1.2	-	-	-	-	-	-	-	-	-	-
40 Maize Hand Planters	2.0	-	-	-	-	-	-	-	-	-	-
7 Maize Rolling Injection Planters	1.4	-	-	-	-	-	-	-	-	-	-
2 Rototiller	4.0	-	-	-	-	-	-	-	-	-	-
7 Dehumidifiers	1.8	-	-	-	-	-	-	-	-	-	-
5 Seed Cleaners	1.0	-	-	-	-	-	-	-	-	-	-
5 Seed Driers	5.0	-	-	-	-	-	-	-	-	-	-
11 Tl-59 Programmable Calculators	1.9	-	-	-	-	-	-	-	-	-	-
4 Burrows Digital Moisture Meters	6.0	-	-	-	-	-	-	-	-	-	-
2 Nikon FM Cameras	0.6	-	-	-	-	-	-	-	-	-	-
2 Kodak Caramate Slide Viewer	0.8	-	-	-	-	-	-	-	-	-	-

Table 3 (cont'd)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
2 Minature Weather Equipment	6.0	-	-	-	-	-	-	-	-	-	-
2 Radio SR 206 Tranceiver	14.4	-	-	-	-	-	-	-	-	-	-
AR 210A Converter											
AR 247-2 Antenna and accessories											
. Pathology Laboratory Equipment - Nkolbisson	20.0	-	-	-	-	-	-	-	-	-	-
. Soils Laboratory Equipment - Maroua	20.0	-	-	-	-	-	-	-	-	-	-
. Entomology Laboratory Equipment - Nkolbisson	20.0	-	-	-	-	-	-	-	-	-	-
. Miscellaneous Equipment	5.0	-	-	-	-	-	-	-	-	-	-
. Transportation	173.1	-	-	-	-	-	-	-		-	-
Others during the course of the project	-	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	3.0
TOTAL	519.4	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	3.0

- Vehicles: It has been assumed based on past experience, that vehicles will have to be replaced every three years.

- Furniture and Appliances: On average it has been assumed that each set of equipment will have to be replaced after five years.

- Office Furniture/Equipment: This type of equipment will be purchased locally and replaced after five years. Initially office furniture and air conditioners will be provided for cameroonian counterparts in offices build by AID. Afterwards replacement will be provided by IRA.

Field, Research and Laboratory Equipment: The list of equipment is based on needs expressed by the IRA researchers presently working within the project. It has been assumed that similar equipment will be needed in the new locations (Foumbout and Ekona). During the course of the project, $15,000 per year has been allocated to purchase additional needed equipment.

ANNEX D

DETAILED ENGINEERING ANALYSIS AND CONSTRUCTION PROGRAM

A. Construction Program: For this second phase of the project, construction is planned for twelve houses, seven laboratory warehouses and five offices. All construction will be on IRA property and will be distributed as shown in the Table below.

IRA location	No. of Houses	Area of Office (m^2)	Area of Warehouse (m^2)
YAOUNDE	2	125	234
GAROUA	1	0	234
MAROUA	2	47	234
BAMENDA	3	125	234
EKONA	2	94	234
FOUMBOT	2	94	234
DSCHANG	0	0	234

The number of houses and area of office space and laboratory warehouse space was determined by analyzing requirements for staff and their counterparts needed to undertake the supplementary project.

B. Construction Cost Estimates cited in this report were based on unit costs of construction determined by analysis of past construction costs for similar facilities, after allowing for geographic differences and after updating using an estimated inflation rate of approximately fifteen percent over the last two years. Thus for houses and offce buildings, unit costs of $500 per square meter were used for Yaounde, $550 per square meter for those locations in the West highlands and Northwest (Bamenda, Ekona, Foumbot and Dschang) and $600 per square meter for Garoua and Maroua in the Northern regions. For laboratory warehouses, slightly lower unit costs of $450, $500 and $550 per square meter respectively were used for the same geographic areas. Note that in computing required surface area of office, a thirty percent allowance was added to usable space to include requirements for walls, corridors, bathrooms, broom closets, canopies, reception/waiting area etc.

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	Cost of Houses (Dollars)	Cost of Office (Dollars)	Cost of Lab/Warehouse (Dollars)	Total cost (Dollars)
YAOUNDE	200,000	62,500	105,300	367,800
GAROUA	120,000	0	128,700	248,700
MAROUA	240,000	28,200	128,700	396,900
BAMENDA	330,000	68,750	117,000	515,750
EKONA	220,000	51,700	117,000	388,700
FOUMBOT	220,000	51,700	117,000	388,700
DSCHANG	0	0	117,000	117,000
		TOTAL		2,423,550
		10% A/E DESIGN AND SUPERVISION CONTROL		242,355
		TOTAL COST (W/O Contingency)		2,665,905

C. Pre-construction Planning. The specific sites where construction will take place have not yet been identified. Site selection should be a joint effort by the Project Officer, Project Manager, the Director of IRA of the province concerned, the USAID Engineer and a representative from each service of the Ministry/Ministries concerned. With input from these various individuals the most suitable site will be selected from the point of view of functionality and cost effectiveness, while satisfying the overall needs and objectives of the project. The following schedule is only indicative of the approximate time frame in which construction could take place.

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D. Indicative Pre-construction Schedule

Activity	Duration	Approx. time frame
1. Visit sites in field and select specific sites	2 weeks	1-15 May 1984
2. Select Surveyor to do field survey	6 weeks	16 May - 30 June 84
3. Field Survey of sites	4 weeks	2 July - 31 July 84
submittal of Survey maps	3 weeks	1 August - 22 August 84
4. Select A/E firm to do layout, design and plans and specifications including advertisement and award	10 weeks	23 August - 5 November 84
5. Layout, design Preliminary plans and Specifications by A/E	16 weeks	6 November - 28 February 85
6. Review of plans, Specifications and Estimates by USAID and GRC	3 weeks	1 March - 22 March 85
7. Preparation of final plans, specifications contract documents by A/E	4 weeks	25 March - 22 April 85
8. Advertise contract for Bids	4 weeks	29 April - 29 May 85
9. Select Contractor	2 weeks	3 June - 17 June 85
10. Award Contract	2 weeks	19 June 85 - 2 July 85
11. Initiate Construction	4 weeks	3 July 85 - 4 August 85

It is to be noted that appropriate engineering and design criteria will be developed by the A/E firm hired to prepare plans, specifications and contract documents. Considerations as to access to water, electricity, telephones etc will also be addressed by the A/E firm. Details about type of construction will be decided upon after due consideration of cost efficiency, functionality and harmony with existing buildings and the general environment.

E. Construction Schedule A detailed construction schedule will be developed by the A/E firm at the time of preparation of the contract document. It is recommended that all construction be undertaken simultaneously using several contractors because of the wide geographical dispersion of the sites. Normally construction at any one of these sites should be completed in nine months. However, eighteen months should be allowed for completion of construction because of interruption of the work during the rainy seasons (March to May and September to December). Based on the preliminary schedule shown above, it is expected that construction could start in early August 1985 and be completed by the end of January 1987.

F. Contract and Payment Procedure Because of the shortage of qualified personnel within the Ministry of Equipment to prepare plans and contract documents and administer, monitor and control the construction, it is recommended that an A/E firm be hired to prepare plans and contract documents as well as administer, supervise and control the construction. Such an A/E contract should be a direct AID contract in order to eliminate costly time delays involved with reviews and approvals through the various governmental levels. Government officials agree that a direct AID contract would be much more efficient during the construction boom period that Cameroon is presently undergoing, in view of the shortage of qualified personnel to execute and administer the contract.

It is recommended that Host Country "Modified FAR" Contracts be awarded for construction.

"FAR" is a form of project assistance where a fixed amount of reimbursement is made upon physical completion of a project, subproject or quantifiable element within the project " to cite from Appendix 3F, Paragraph B1 of HandBook 3, Part 1. Although not explicitly stated, routine inspection during the course of construction is normally not done with the FAR method.

However, because of the problems encountered with this method during the first phase of the project and with other projects using this method in Cameroon (unsatisfactory work and non completion of projects). It is recommended that there be routine inspection and submittal of progress reports by an A/E firm hired to do the supervision and control of the work.

Further, it is proposed that it be explicitly stated in the contract documents that there will be a site visit and pre-submission conference among prospective bidders, the Ministry of Equipment representative technically responsible for the project, the A/E representative and the USAID engineer. The purpose of the site visit and conference will be to afford bidders the opportunity to make significant comments, to clarify questions and to have concurrence on additional items of work that may have been omitted but which need to be inserted in the contract to assure completeness and practicability of the finished construction. In this way, there will be no recourse on the part of the contractor to requesting additional payment for needed supplemental work after the contract has been awarded.

It is also proposed that payments be made only at specific construction milestones such as completion of foundation, completion of structural framing (columns and beams), completion of roofing etc, and only after a joint inspection and report (at such milestones) by the A/E, the USAID Engineer and the Project Manager (GRC) or his technical representative.

During the preparation of the bid documents the A/E firm can assess what percent of value each milestone (eg completion of foundation work) will represent and on this basis establish the amount of each partial payment. In this way, payment will be in keeping with one of the essential principles of the FAR Method, that is, reimbursement based on planned outputs rather than inputs.

UNITED STATES GOVERNMENT

memorandum

DATE: April 10, 1984

REPLY TO ATTN OF: Winfield S. Collins, P.E. PDE/GEO WSC

SUBJECT: 611 A (1) Certification NCRE Project Paper Supplement

THRU: Samuel T. Scott, Chief, Proj. Dev. and Evaluation Office

TO: Mission Director, USAID/Cameroon

This is to certify that I have examined existing as well as proposed plans and investigated engineering requirements for this project. I have also analyzed the engineering feasibility and construction costs as reflected in this Annex. Based on my evaluation of available data, I find the schedules and costs to be reasonable, and therefore recommend that you approve such schedules and estimates of cost in accordance with Section 611(a)(1) of the Foreign Assistance Act of 1961 as amended.

Approved: _____

Disapproved: _____

Date: _____

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

OPTIONAL FORM NO. 10
(REV. 7-76)
GSA FPMR (41 CFR) 101-11.6
5010-112
★ GPO : 1976 O - 261-647 (3523)

ANNEX E

SPECIFIC AREAS OF POLICY CONCERN RELATED TO THE SUCCESSFUL IMPLEMENTATION OF THE EXPANDED NCRE PROJECT

The National Cereals Research and Extension Project and this Project Supplement has, as its objective, the development of Cameroonian institutional capacity to provide high quality applicable research on cereals crops and to facilitate transmission of research results to the farmer. The effective utilization of these results to meet the growing demand of food crop production in Cameroon depends upon a variety of interdependent forces and policies in the areas of population growth, marketing, and provision of inputs. USAID/Cameroon believes the GRC has recognized its needs in all of these areas and that they will be adequately addressed before completion of the project.

A. Population:

The population growth rate in Cameroon is approximately 2.7 per cent per year. Although the country currently is close to self-sufficiency in foodstuffs, unchecked population growth and increased rural-urban migration can quickly outstrip any progress made in improving food crop production.

The question arises as to whether Cameroon is adequately addressing its population growth issue in light of its interest in increasing food crop production. Currently Cameroon is not experiencing population pressures and maintains a cultural heritage which is strongly pronatalist. Changes in perceptions will be slow and difficult to initiate. USAID/Cameroon already has made significant progress in this area utilizing the resources of the Futures Group's RAPID presentation. Whereas in recent years it was impossible to entertain a dialog with the GRC on population issues, the RAPID Presentation has broken the ice and received a very wide and significant audience in the GRC. The Futures Group has visited Cameroon on several occasions and places Cameroon's interest and sincerity in the subject among the top of those African nations it has visited. USAID/Cameroon is confident that this trend will continue and the GRC will make significant efforts in this area in the near future.

B. Marketing

The GRC generally alllows the private sector to play a significant role in the country's development and places an overall reliance upon the market place for determining prices. Food crop prices have traditionally been determined by the open market without government interference or control. USAID/Cameroon expects this tradition to continue. Increased levels of food crop production will require expanded transportation and storage facilities. Cameroon currently is making major investments in its transportation system and agressively promotes the creation of cooperative such as those that would be expected to play a major role in the marketing of food crops. USAID/Cameroon believes that issues in this area are being adequately addressed by the GRC.

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C. Inputs

Siginificant gains in the area of cereals research can not be translated into visible gains of food production at the farm level unless the farmer has easy access to necessary inputs. These inputs include improved seed, fertilizers, herbicides, pesticides, credit, appropriate tools and agriculture extension service support.

1. Improved seed: The GRC Fifth Plan gives considerable attention to the importance of improved varieties of food crops in order to reach production targets. It has charged the Ministry of Agriculture with the operation of seed multiplication farms under the Food Development Authority (MIDEVIV). MIDEVIV currently operates 4 seed multiplication farms in 4 separate ecological zones in Cameroon. USAID is providing support for the largest of these under its North Cameroon Seed Multiplication Project. USAID has, as a secondary objective of the project, aimed at the eventual privatization of seed multiplication operations.

2. Fertilizers, pesticides, herbicides: These items are generally unavailable on the free market and are imported almost exclusively for use by large cash crop parastatals or for distribution by the Ministry of Agriculture directly. These items are subsidized at approximately 50 per cent of their value, the subsidy being derived mostly from the difference between the export market prices and the controlled prices paid to farmers for their cash crops. Although some of these products find their way to food crop production, they are neither the proper product nor are they available in sufficient quantities. USAID/Cameroon is developing a policy dialog with the GRC aimed at increasing the importation of appropriate fertilizers and associated chemical products into Cameroon for use on food crops. Although initially retaining the subsidy, this would be gradually decreased and eliminated as farmers begin major involvement in food crop production. Since food crop prices are determined on the free market, pricing of inputs would also be determined by market forces.

3. Credit: Food crop production, as is true with most farming enterprises, requires capital outlays in advance for producing next season's harvest. Possession of available cash to purchase the needed inputs is especially difficult for low-income farmers whose small volume of sales barely cover their day-to-day family living costs. FONADER (National Fund For Rural Development) was created by the Cameroon Government in 1973 to promote economic and social development in the rural areas through credit and investment capital to farmers, cooperatives, development projects, etc. Therefore, it is the major supplier of funds for the development of the agricultural sector.

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The Primary way that FONADER extends credit to farmers is through Marketing Cooperatives. In as much as marketing cooperatives have not been widely developed for small farmer food crops compared to export crops, this sector has not benefited significantly from the FONADER low-interest credit. FONADER has shown interest in working with marketing cooperatives and USAID/Cameroon will continue to encourage their formation as levels of food crop production increase.

D. Agriculture Extension Service

Currently it can be said that the majority of small holders are still without access to an effective food crop extension service. The ratio of farm families to extension works is about 270 to 1 which is more than adequate to ensure good coverage. The Ministry of Agriculture extension workers represent 43 per cent of the total Cameroonian extension staff. The rest are part of parastatal organizations and development societies..

The GRC has developed a policy that when a parastatal or development society operates in an area, the Ministry of Agriculture staff would be reduced or taken over by the society. In effect, this policy often has led to duplication and waste of financial resources. Above all, these extension workers are concerned almost entirely with cash crops.

The GRC has recognized this problem and has asked USAID to assist in improving extension services in the food crop sector. Specifically, the GRC has asked USAID to assist in the creation of technical support centers as training centers for farmers and extension agents as well as mechnisms for transfer of agricultural technology. USAID/Cameroon conducted a detailed study of the Cameroon Extension Program in the latter part of 1983. This study provided a review of the agricultural exctension network in each of Cameroon,s 10 provinces and detailed recommendations of changes required. This study currently is under review by the GRC and preliminary indications are that USAID will be asked to assist in implementing some of the recommendations. USAID/Cameroon has complete confidence that necessary steps will be taken by the GRC to address the extension issue and is proposing the expansion of the role and number of TLU's as an intermediary step until the extension role of the Ministry of Agriculture and that of University of Dschang are allowed to develop.

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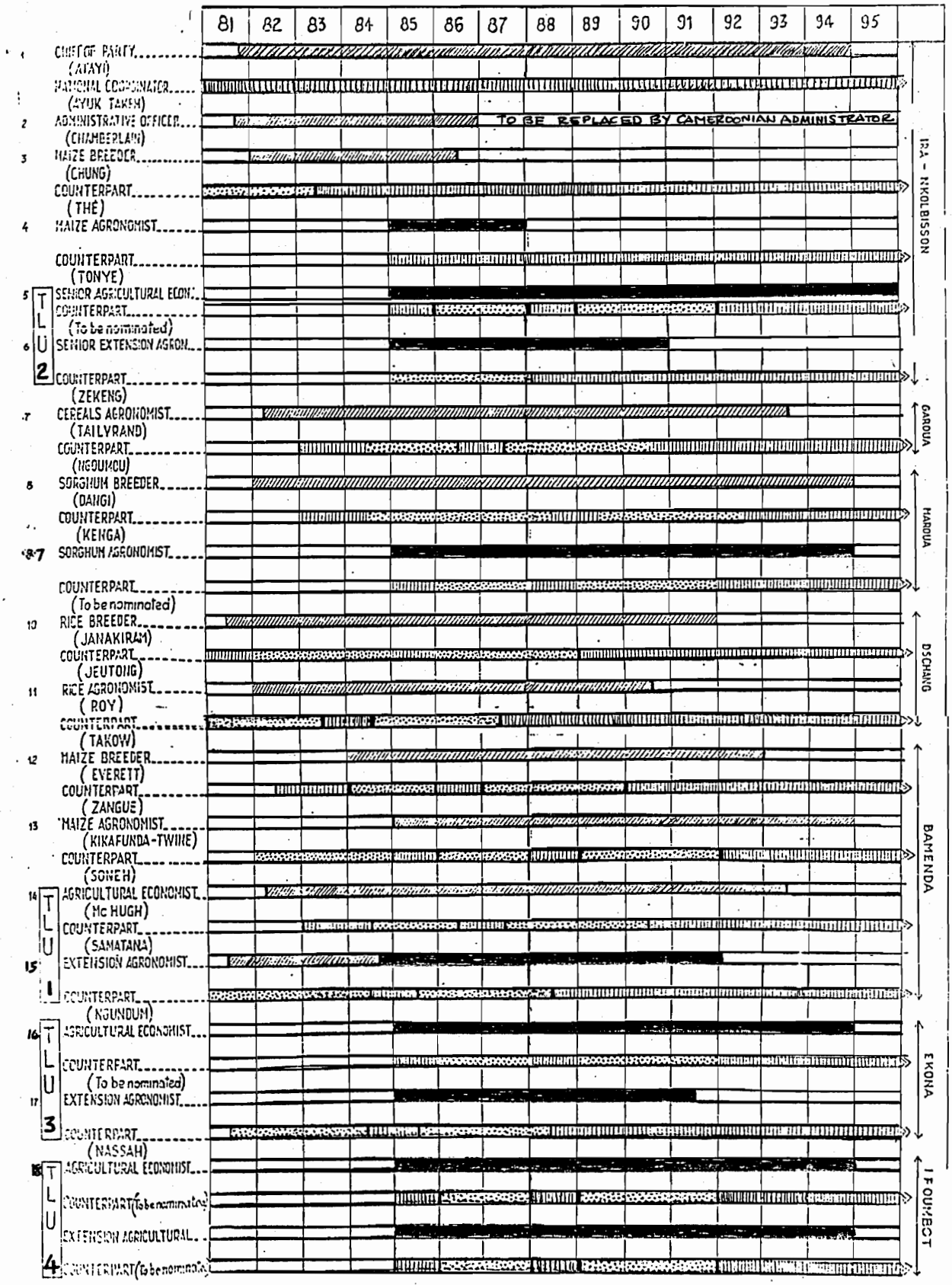
TECHNICAL ASSISTANCE AND TRAINING SUMMARY OF RESOURCES (1981-1995) **ANNEX F**



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