

**OFFICE OF THE
DIRECTOR, INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20543**

**PERU
PROJECT PAPER
AGRICULTURAL RESEARCH, EXTENSION
AND EDUCATION**

AID/LAC/P-042

**Project Number: 500
Low Budget: 1000**

UNCLASSIFIED

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT DATA SHEET	1. TRANSACTION CODE <input type="checkbox"/> A = Add <input type="checkbox"/> C = Change <input type="checkbox"/> D = Delete	Amendment Number _____	DOCUMENT CODE 3
--	--	------------------------	----------------------------------

2. COUNTRY/ENTITY PERU	3. PROJECT NUMBER 527-0192
----------------------------------	--------------------------------------

4. BUREAU/OFFICE LA <input type="checkbox"/> 05	5. PROJECT TITLE (maximum 40 characters) Agric. Research, Extension & Education
--	---

6. PROJECT ASSISTANCE COMPLETION DATE (PACD) MM DD YY 8 31 85	7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4) A. Initial FY <input type="checkbox"/> 80 B. Quarter <input type="checkbox"/> 3 C. Final FY <input type="checkbox"/> 84
--	--

8. COSTS (\$000 OR EQUIVALENT \$1 =)						
A. FUNDING SOURCE	FIRST FY 80			LIFE OF PROJECT		
	B. FX	C. L/C	D. Total	E. FX	F. L/C	G. Total
AID Appropriated Total	2,754	6,646	9,400	4,554	6,646	11,000
(Grant)	(400)	(-)	(400)	(2,000)	(-)	(2,000)
(Loan)	(2,354)	(6,646)	(9,000)	(2,354)	(6,646)	(9,000)
Other U.S.						
1.						
2.						
Host Country	-	440	440	-	4,000	4,000
Other Donor(s)						
TOTALS	2,754	7,086	9,840	4,354	10,646	15,000

9. SCHEDULE OF AID FUNDING (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE		D. OBLIGATIONS TO DATE		E. AMOUNT APPROVED THIS ACTION		F. LIFE OF PROJECT	
		1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan	1. Grant	2. Loan
(1) IH	213	050	070	-	-	400	9,000	2,000	9,000
(2)									
(3)									
(4)									
TOTALS						400	9,000	2,000	9,000

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each)	11. SECONDARY PURPOSE CODE 241
--	--

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)									
A. Code	PS	R/AG							
B. Amount									

13. PROJECT PURPOSE (maximum 480 characters)

The purpose of the Project is to create an Agricultural Research Extension and Education System that will enable the institutions involved in agricultural research, extension and education to: (a) increase agricultural production by structuring the basis for enhancing and reinforcing the human resources required for agricultural research extension and education; (b) Provide for a continual flow of varying levels of agricultural technology which meet the needs of the small and medium sized farmers, as well as those of the associative enterprises.

14. SCHEDULED EVALUATIONS Interim MM YY MM YY Final MM YY 8 1 8 5	15. SOURCE/ORIGIN OF GOODS AND SERVICES <input checked="" type="checkbox"/> 000 <input checked="" type="checkbox"/> 941 <input checked="" type="checkbox"/> Local <input type="checkbox"/> Other (Specify) 935
--	--

17. APPROVED BY	Signature: Leonard Yaeger Title: Mission Director	18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION Part Signed MM DD YY 2 12 80 MM DD YY 02 13 80
------------------------	--	---

UNITED STATES INTERNATIONAL DEVELOPMENT COOPERATION AGENCY
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D.C. 20523

THE ADMINISTRATOR:

PROJECT AUTHORIZATION

Name of Country: Peru
Name of Project: Agricultural Research, Extension and Education Project
Number of Project: 527-0192

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Agricultural Research, Extension and Education Project for Peru (the "Cooperating Country") involving planned obligations of not to exceed \$9,000,000 in loan funds over a one year period ("Loan") and \$2,000,000 in grant funds over a five year period ("Grant") from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.

2. The project ("Project") consists of the creation of an Agricultural Research, Extension and Education system in Peru that will enable institutions involved in agricultural research, extension and education to increase agricultural production and to provide agricultural technology to meet the needs of small and medium sized farmers and associative enterprises.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in U.S. Dollars within twenty-five (25) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in U.S. Dollars interest from the date of first disbursement of the Loan at the rate of (i) two percent (2%) per annum during the first ten (10) years, and (ii) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by A.I.D. under the Loan shall have their source and origin in Peru or in the countries included in A.I.D. Geographic Code 941, except as specifically stated in paragraph f. below

and except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Loan shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States or Peru. Goods and services, except for ocean shipping, financed by A.I.D. under the Grant shall have their source and origin in the United States or Peru, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Grant shall, except as A.I.D. may otherwise agree in writing, be financed only on flag vessels of the United States.

c. Condition Precedent to Initial Disbursement (Loan)

Prior to any disbursement under the Loan, or to the issuance of any commitment documents under the Project Agreement for activities financed under the Loan, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D., evidence that the Cooperating Country has established a national research extension education (REE) administrative system for the direction, coordination, financing, planning and implementation of research extension and education activities under the Project. Such evidence shall include a staffing plan for the REE system.

d. Conditions Precedent to Disbursement for Particular Activities (Loan)

(1) Prior to any disbursement under the Loan, or to the issuance of any commitment documents under the Project Agreement, to finance salary supplements, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D., an implementation plan for providing salary supplements to specified REE employees working within the REE system. The implementation plan shall include plans for the assumption by the Cooperating Country of the cost of the salary supplements over the life of the Project.

(2) Prior to any disbursement under the Loan, or to the issuance of any commitment documents under the Project Agreement, to finance vehicles, equipment and facility improvements, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D., a procurement plan for vehicles and equipment and a plan for the installation of equipment over the life of the Project.

(3) Prior to any disbursement under the Loan, or to the issuance of any commitment documents under the Project Agreement, to finance training under the Loan, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D., a time-phased implementation plan for training over the life of the Project.

e. Covenants

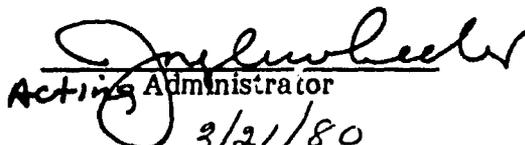
(1) The Cooperating Country shall covenant that it will detail to the REE system on a permanent basis such personnel as are identified in the staffing plan for the REE system referred to in paragraph c.

(2) The Cooperating Country shall covenant to assume the cost of the salary supplements to specified REE employees in the manner set out in the implementation plan referred to in paragraph d (1).

f. Waivers

The following waiver to A.I.D. regulations is hereby approved:

Pursuant to Section 5B4 of Handbook 1B, A.I.D. source, origin and nationality regulations are hereby waived to permit the procurement of up to 75 lightweight motorcycles under the Loan from countries included in A.I.D. Geographic Code 935. In granting this waiver, I 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.


Acting Administrator
3/21/80
Date

Clearances:

GC:NLHolmes: 3/10/80 date JPH
LAC/SA:RWeber: 11/1 date 3/3/80
LAC/DR:NParker: 10/1 date 3/3/80
LAC/DR:MBrown: 8/5 date 3/17/80
AAA/LAC:ECoy: 7/6/80 date 3/10/80
SER/COM:WSchmeisser: 1/25 date 3/2/80
AA/PPC:AShakow: 1/25 date 3/14/80
Drafted:GC/LAC:JLKessler:ckg:2/27/80:ext:23272

PROJECT PAPER

AGRICULTURAL RESEARCH EXTENSION AND EDUCATION

Table of Contents

	<u>Page</u>
PART I SUMMARY AND RECOMMENDATIONS	1
A. Recommendations	1
B. Participating Agencies	1
C. Summary Project Description	1
D. Summary Findings	7
E. Summary Financial Plan	7
F. USAID/Peru Project Development Committee	7
PART II PROJECT DESCRIPTION	8
A. Background	8
1. Country Setting	8
2. Project Rationale	9
3. Problem	11
B. Project Description	19
1. Goal and Purpose	19
2. End of the Project Status	20
3. Outputs	20
4. The REE System	20
C. USAID Assistance Strategy	34
1. Relationship to Mission CDSS Strategy	34
2. Relationship to Current Mission Programs ..	35
3. Other Donor Activity	36
PART III PROJECT ANALYSIS	37
A. Administrative Feasibility	37
1. Institutional Background and Organization .	37
2. Administrative Analysis of the Implementing Agencies	39
3. Project Implementation and Coordination ...	44
B. Financial Analysis	48
1. Financial Plan	48
2. Recurrent Costs	55
C. Economic Analysis	55
1. Economic Overview of Agricultural Sector ..	55
2. Economic Rationale for the REE System	59
3. Macroeconomic Impact of REE	60
4. Cost Effectiveness of REE	61

	<u>Page</u>
D. Social Analysis	62
1. Social Structure Overview of Target Population	62
2. Project Beneficiaries	64
3. Constraints to Project Success	65
4. Role of Women	66
E. Technical Analysis	67
1. Extension Outreach Methodology	67
2. Commodity versus the Farm Management Approach	69
3. Salary Supplements	71
4. Crop Selection	72
F. Environmental Impact	74
 PART IV IMPLEMENTATION ARRANGEMENTS	 75
A. Recipients and AID's Administrative Arrangements	 75
1. Implementing Agency	75
2. A.I.D.	75
B. Implementation Plan	77
C. Evaluation Plan	81

ANNEXES

- I. Legal Exhibits
 1. 611(e) Certification
 2. Loan Application
 3. Draft Loan Authorization and Project Description
 4. Statutory Checklist

- II. Project Exhibits
 1. PID Guidance Message
 2. Logical Framework
 3. Initial Environmental Evaluation

- III. Technical Exhibits
 1. Baseline Study
 2. National REE Management Division Organigram
 3. INIA -- Organigram
 4. Dirección General de Agricultura y Crianzas -
Organigram
 5. Universidad Nacional Agraria - Organigram
 6. List of Donors with REE activities
 7. Procurement Plan
 8. Equipment List

Abbreviations used in this Paper

CENCIRA	-	National Center of Training and Research for the Agrarian Reform
CDSS	-	Country Development Strategy Statement
CONUP	-	National Council of Peruvian Universities
GDAL	-	General Directorate of Agriculture and Livestock (MAF)
GOP	-	Government of Peru
IMF	-	International Monetary Fund
INIA	-	National Agrarian Research Institute
MAF	-	Ministry of Agriculture and Food (Formed 1976)
MOA	-	Ministry of Agriculture
MOF	-	Ministry of Food (Formed 1974)
NAU	-	National Agrarian University at La Molina
NPP	-	National Production Programs
REE	-	Research, Extension and Education System
RSL	-	Regional Service Laboratories
SCIPA	-	Inter-American Cooperative Food Production Service
SIPA	-	Agrarian Investigation and Promotion Service

I. SUMMARY AND RECOMMENDATIONS

A. Recommendations

1. That a loan be authorized to the Government of Peru (GOP) in the amount of \$9,000,000, with a 25 year term including a 10 year grace period, and at 2% interest during the grace period and 3% interest thereafter.

2. That a grant be approved in the amount of \$2,000,000 to be incrementally authorized as follows:

- a. FY 80 - \$400,000
- b. FY 81 - \$500,000
- c. FY 82 - \$400,000
- d. FY 83 - \$400,000
- e. FY 84 - \$300,000

B. Participating Agencies

The Borrower and Grantee will be the GOP represented by the Ministry of Economy and Finance. The Ministry of Agriculture and Food (MAF) will be the Ministry with direct Project responsibility. The Project's implementing agency will be the National REE Management Division located within INIA, a semi-autonomous agency of the MAF.

C. Summary Project Description

The goal of the Project is to further the socio-economic development of the Peruvian small farmers so as to increase the production and income of the rural population of Peru.

The purpose of the Project is to create and Agricultural, Research, Extension and Education System (REE) that will enable the institutions involved in agricultural research, extension and education to:

- a. Increase agricultural production by structuring the basis for enhancing and reinforcing the human resources required for agricultural research, extension and education.
- b. Provide for a continual flow of varying levels of agricultural technology which meet the needs of the small and medium-sized farmers, as well as those of the associative enterprises.

The overall socio-economic development of the small farmer of Peru is dependent upon the adoption of improved agricultural technology and practices. A Research, Extension and Education System is essential to accomplish the transfer to the small farmer of these improved agricultural practices. Within the last year, the GOP has shown interest in improving the existing REE System

and has recently completed a joint GOP-Title XII Baseline Study of Agricultural Research, Extension and Education. This study of the status of existing REE institutions indicates that there is little technical talent left in these institutions. The economy of the nation is such that it will be difficult for it to budget increased resources for the rebuilding process in the short-term, no matter how urgently required. Thus, careful strategies must be developed which will, in a reasonable period of time, provide technological information to the producer resulting in farm production increases. The short-term strategy should, therefore, be based on efficient and timely incorporation of existing resources that will provide the GOP with evidence that justifies increased investment in this area. In the longer term the baseline study identifies objectives over a 15 year planning period which will provide for the attainment of the short-term objectives and the longer term institutional development necessary to carry-out the strategies and programs which provide not only for the stabilization of the system, but also expansion so as to accomplish its wider goals.

Thus, initially under this Project the focus will be on the production of crops which are GOP political priorities, are widely grown by target farmers and which are currently being imported to cover existing deficits. These crops, which will show production increases in relatively short periods of time include rice, potatoes, corn, grain legumes and small grains. In the longer term, a follow-on project could cover additional products which require longer periods to show production increases. In this second phase livestock, range improvement and pasture management would be added to the extension packages, as would such other areas of interest as youth clubs, home extension, etc. The proposed Project is, therefore, the first phase of a broader program. These initial activities will provide the institutional and programmatic basis for additional activities which the GOP, A.I.D. and other donors would consider funding in the future.

1. End of the Project Status

By the end of the Project, the following conditions should exist indicating achievement of the Project purpose:

(a) A functioning agricultural REE System in place, whose activities are coordinated by a permanent management unit responsible for developing and transferring technical information designed to increase agricultural production and farm incomes;

(b) The agricultural output of the five commodities selected for attention under the Project will increase, permitting imports to decrease and providing a more stable supply of staple food products to the urban population;

(c) The necessary human resources required to implement a dynamic agricultural REE system will be provided and reinforced through continual training of personnel as needed by the System;

(d) The establishment of a flow of information between the REE system and the International Research Centers and U.S. universities so as to capitalize on the agricultural technology being developed by these organizations for application to Peruvian production conditions;

(e) The GOP will have significantly expanded its financial and technical investments assigned to the REE system.

2. Outputs

The major outputs of the REE system anticipated under the Project include the formation of: (a) five National Production Programs; (b) six Regional Service Laboratories; (c) five Regional Research Centers; (d) a National Research Support Unit; (e) an Education Program, and (f) a National REE Management Division. The Baseline Study identified these outputs as necessary to the development of the REE system.

The Project will impact on 275,000 small farmers and members of agrarian reform enterprises located primarily in the Peruvian Sierra and high jungle. This represents 40% of the total number of agricultural producers who are located in those regions. These will be reached through: a) NPPs sectoristas who will directly impact on 125,000 farmers; b) additionally trained sectoristas receiving information from the REE System will impact on 100,000 farmers; c) field days and demonstrations will reach another 5,000 and; d) the regional service laboratories will provide analysis to approximately 90,000 farm families. This Project will create an REE system which will initially include 30% of the existing uncoordinated REE programs, and which will be further expanded as the REE system gains managerial capabilities and institutional maturity.

3. The REE System

The Project emphasizes the development of an integrated REE system rather than individually supporting a series of uncoordinated activities currently in place. The cost of an uncoordinated system to the GOP and to the farmer is high and is a waste of scarce resources. Therefore, a key element of this Project is the creation of a National REE Management Division to direct all activities included in the REE System and to assure that as the research component develops improved production technology this information is transmitted to the producers, in an effective manner through the Project's extension activities.

The National REE Management Division will be located in Lima and will be comprised of representatives of INIA, CENCIRA, the universities, MAF and other institution as deemed necessary. The principal responsibility of this unit will be to plan, implement and evaluate the activities of the system. The unit will also be responsible for formal and informal agreements between various institutions so as to assure the efficient and timely input of human, financial and material resources to the system.

The proposed Project will strengthen the REE system by providing financial assistance for the following components:

(a) Extension

The capacity of the national extension service to develop technological extension packages and transfer the content of these packages to the farmer will be strengthened with the formation of five National Production Programs (NPPs). These programs will focus on staple cash crops which form the basis of small farm agriculture in the Sierra and high jungle. The production of these basic commodities are also GOP political priorities and most are currently being imported to cover existing deficits. The NPPs will be staffed by researchers, extension specialists, and sectoristas from INIA, selected universities and the Ministry of Agriculture and Food (MAF). They will be centered at existing INIA or university facilities with specific operational satellites to be located at major production centers for each commodity.

Additionally, the Project will establish six Regional Service Laboratories to supply soil, water and plant and animal tissue analysis services to producers through the sectoristas. These analysis will be provided on a fee basis to the producer. Recommendations for fertilizer, lime and pesticide use based on these analysis will assist in assuring the timely and efficient application of the production guidelines contained in the technological extension packages developed by the NPPs.

The Regional Service Laboratories will be housed at existing MAF facilities selected to maximize their accessibility to farmer-recipients of NPPs' services. Each laboratory will be staffed by employees of the MAF assigned permanently to the Regional Service Laboratories.

(b) Research

A sustained increase in food production in the future will be required if Peruvian agriculture is to provide the savings in foreign exchange and supply the food necessary to support its development goals. Food supplies, in the Peruvian context, can

be expanded by either bringing additional land into cultivation or through better utilization of existing cultivable land. USAID/Peru strategy aims at both, i.e. The Sub-Tropical Lands project is bringing new land into production, but in order to sustain increased agricultural output it is imperative that the utilization of existing farm land be intensified through the utilization of modern technologies such as fertilization, improved crop varieties, weed and pest control and mechanization. The successful transfer of the extension packages developed by each NPP will result in the increase in food production of the selected commodities. However, a continual flow of additional information must be developed to assure the successful application of the extension packages of each NPP to regions of varying soil fertility, specific irrigation and drainage conditions, different plant pest problems and varying economic production situations.

This development of disciplinary information is a primary research task. The development of this research capability is essential to provide a continual flow of information to the extension personnel and on to the producers.

The current Peruvian economic difficulties preclude continued increases in the importation of food and require increasing agricultural production in the short, as well as in the longer run. Peru can afford neither the time nor the resources necessary to develop a basic research capability to supply the technical information required and, therefore, must concentrate on the development of an applied research capability as proposed under this Project. This strategy is based on the premise that Peru can take advantage of a large body of fundamental scientific principles and methodological know-how built up in other countries over the years. The Project will adapt this information and experience through an applied research program oriented to the Peruvian Production situation. Project activities under this component will include:

i. Regional Research Centers

Given the diverse ecological conditions of the country, it is necessary to provide pertinent information to the five NPP teams on soil management, irrigation and drainage, plant protection, etc. Thus, five Regional Research Centers located near the satellite areas of the NPPs will be established. These Regional Research Centers will be housed at existing INIA facilities and will be staffed by INIA and university personnel.

ii. National Research Support Unit

It will be necessary to develop a national research support unit with expertise in such areas as genetics, plant pathology, entomology, natural resource management, agro-industry,

etc., as the Regional Research Centers develop the capacity to conduct applied research in support of the NPPs. The purpose of the National Research Support Unit will be two-fold. First, the Unit will provide specific technical research information required by the Regional Research Centers and will disseminate the research information developed in one region of the country to other regions. The Unit will serve as support to the Regional Research Centers by continuing the flow of research information at a level beyond the capacity of the Centers and will be incorporated into the regional research programs and eventually the NPPs. Secondly, the Unit will conduct research on other specific commodities not included in the commodities selected for the initial NPPs in order to develop a knowledge base for future expansion of the commodities covered through the NPPs. The National Research Support Unit will also direct an applied research effort toward agricultural research in other areas of general agricultural interest, such as agricultural production in the low jungle.

iii. Demonstration Sites

Because the Regional Research Centers will be select in personnel as well as physical resources, it is important to indicate the role, to be played by existing additional research/demonstration facilities in the regions of Peru. Five additional existing research sites will also be utilized to locate demonstration sites which support operations for the system. The involvement of these experimental stations and their personnel will be through the production of improved seed, genetic stock, improved livestock, etc. This activity offers relatively un-trained extension personnel the opportunity to learn practical aspects of production, and will serve as an evaluation mechanism of specialists who might be incorporated into existing NPPs or future NPPs.

(c) Education

The Baseline Study emphasized the importance of including the national agricultural universities in the proposed REE system. University personnel will be involved in the Project as members of various NPPs and research programs, however, the major university involvement in the Project will be through the provision of training at the National Agrarian University at La Molina (NAU) for Project personnel at various levels of the system. The NAU currently has the only agricultural graduate program in Peru and possesses faculty depth to provide, with only limited assistance, advanced training to the personnel from the research and PP components. Training at the NAU will not only be more applicable to the actual situations of Peru than foreign training, but will also be less expensive. Through training of the research NPP personnel at the NAU, they will receive the required technical skills regional to contribute to the REE System.

D. Summary Findings

The Project Committee has found the Project to be administratively, technically, socially, economically and financially feasible and consistent with the development objectives of the GOP and those objectives set forth in USAID's CDSS document. These analysis of the overall Project are found in Section III of the Project Paper.

E. Project Financial Plan

	<u>Loan</u>	<u>Grant</u>	<u>GOP</u>	<u>Total</u>
I. Extension Program	3,901		1,355	5,256
II. Research Program	2,391	--	1,140	3,531
III. Education Program	405	180	242	827
IV. National REE Management Unit	156	-	110	266
V. Technical Assistance	-	1,700	190	1,890
VI. Inflation and Contingencies	<u>2,147</u>	<u>120</u>	<u>963</u>	<u>3,230</u>
TOTAL	9,000	2,000	4,000	15,000

The total Project cost is estimated at \$15.0 million, of which AID will finance \$11.0 million (75%). The A.I.D. inputs to the Project will consist of a Development Loan of \$9 million and a Grant of \$2.0 million. The GOP will provide cash and in-kind contributions of \$4.0 million. The A.I.D. Grant will fund 135 person months of foreign technical assistance and 12 person years of U.S. long-term training at a total cost of \$2.2 million. Loan funds will finance 18 person years of long-term off shore training, as well as 1,040 person months of short-term training in Peru and 50 person years of long-term training in Peru. (See Section III B for details).

F. USAID/Peru Project Development Committee

Lee Twentyman - Office of Development Resources
Loren Schulze - Agriculture Division
George Wachtenheim - Capital Development Division
Janet Ballantyne - Office Health, Education and Nutrition

Edward Kadunc - Capital Development Division
Cesar Espino - Capital Development Division
John O'Donnell - Office of Agriculture and Rural Development

Larry Smucker - Program Office
Edilberto Alarcon - Engineering Division
John Davison - Controller
Steve Whitman - Regional Legal Advisor

Title XII Baseline Study Team

<u>Title XII Technician</u>	<u>Peruvian Work Group Chairman</u>	<u>Baseline Study Working Groups</u>
Arthur Coutu	Eduardo Grillo/INIA	Ag/Food Situation
Douglass Gross	Pedro Gonzales/INIA	Physical/Biological Research
Lawrence Apple		
Arthur Coutu	Edmundo Inga/INIA	Socio/Economic Research
Gene Mathia	Felix Quevedo/INIA	Agro-Industrial Research
Herbert Scofield	Maximo Urbina/CONUP	Higher and Mid Level Education
Orlando Olcese		
Jane Vella	Cesar Farro/CENCIRA	Rural Education
James Seagraves		
Robert Maxley		
Donald Galvan	Victor Hernan Torres	Extension
Alphonse Chable	La Jara/MAF	
Arthur Coutu	Jose Salhuana/INIA	International Technical Cooperation
Arthur Coutu	Javier Gazzo/INIA	REE Administration, Organization and Infrastructure
Jackson Rigney		

AID/W TDYs

J. Kenneth McDermott	- DSB/AGR
Glenn Taggart	- BIFAD
Allen Hankins	- IAC/DR/RD

II. PROJECT DESCRIPTION

A. Background

1. Country Setting

The availability of land suitable for agriculture in Peru is extremely limited. Most of the areas suitable for intensive agriculture (less than 3% of the country) are already under cultivation; most of the lands not in crop production and with agricultural potential are either in the high jungle (with high costs of access and clearance) or are in the marginal class. The ratio of total croplands actually harvested to total rural population is less than 0.35 hectares; this varies from 0.5 - 1.0 hectares on the Coast to as low as 0.1 - 0.2 hectares in the major Sierra departments (Puno, Cuzco and Cajamarca).

The Sierra accounts for well over half of the cultivable land in Peru but, except for a few valleys with permanent streams, it is an unfavorable environment for agriculture. Before the colonial era, the Incas had terraced large areas, but after the conquest terrace maintenance was abandoned. This, and subsequent deforestation,

accelerated erosion, and large areas have been permanently lost for agricultural production purposes. Less than 7% of the agricultural lands are used for crops and over half of the remainder are used for grazing, mostly under marginal conditions since steep slopes prevail over most of the Sierra. Crop farming is extremely difficult, risky and generally limited to one short growing season from about November to March. Besides severe topography, rainfall is limited (distributed erratically within and between years) and low seasonal temperatures impose a constant risk of frost. With the low and gradually deteriorating soil fertility conditions, fallow periods have lengthened and now reach up to 5 to 7 years. At altitudes above 3,700 m. agricultural conditions have become more difficult. Yields of the major crops fall by as much as 40% and only sheep and criollo cattle can withstand the altitude. Beyond 4,200 m. only llama, vicuña and alpaca can survive. Around one-third of Peru's population makes a living in the rural Sierra and over one-fourth of these live at altitudes above 3,500 m. - practicing a type of farming which is often referred to as primitive, but could equally well be qualified as ingenious, given the precarious resource base.

Most of the increase in production in the Sierra will have to come from improved pasture and livestock management, more and better managed small-scale irrigation works and the successful transfer of production technology including use of fertilizers and improved seeds. Soils in the Ceja de Selva are generally of better quality, and although communications with the rest of the country are exceedingly difficult, the area does offer potential for expansion of the agricultural frontier in areas like the Huallaga Central and the Palcaza-Pichis settlement area.

2. Project Rationale

The proposed REE Project is intended to assist in accomplishing the objectives of the Mission's CDSS strategy. During the past 10 years considerable deterioration has taken place in the agricultural research, extension and education systems. Deterioration in the quality of available technical personnel, program design and execution has occurred as well as in physical facilities and equipment. Since 1977 the GOP has reversed this trend in terms of policy, but lacks the resources to affect the desired revitalization. A Title XII comprehensive baseline study (see Annex II Exhibit 1) of the current agricultural research extension and education system was undertaken during 1979, and serves as the base for development of this Project. The Mission believes that Peruvian agriculture will continue to stagnate without an aggressive, long-term commitment by the GOP and foreign assistance in the area of agricultural

research, extension and education. The above Project rationale is supported by a recent World Bank study which states that:

The extension services of the Government should be expanded and the research focussed on the Sierra, and to a lesser extent, the Selva. Extensionists who formerly were withdrawn from extension activities and engaged in the agrarian reform process are now being re-employed in the service. However, their number is still insufficient, and they will need substantial refresher training before they are effective. Basic practical know-how in the coast is available for most crops, but not in the other two regions. Research in the Sierra should concentrate first on the main crops (potatoes, quinoa, maize, barley and wheat), on livestock production and on agro-economic evaluation of farming systems. Research in the Selva should focus on basic information on the agronomic characteristic and potential, which are still weak, and on a second phase on the needs for rehabilitation of coffee plantations and on the mixed farming systems.^{1/}

Thus, in meeting the objectives of the Mission's CDSS policy, the following components of the basic strategy have been identified as essential for strengthening the REE system in Peru:

- The efforts of the REE system should be oriented toward increasing production of commodities which are economically the most important and politically the most sensitive to the agricultural development of Peru;
- The REE systems should increase the number and technical capacity of trained technicians to efficiently attend to present requirements and the future growth of the REE systems;
- The REE system should develop a newly trained group of researchers, extensionists, and educators by reinforcing the national infrastructure which exist in the Graduate Program of the National Agrarian University (NAU) and/or utilizing international institutions or foreign universities;
- The available human, technical and material resources should be utilized with a high level of efficiency and concentration;

^{1/} Peru: long-term Development Issues. Volume II Pg. 348, 349, April 13, 1979. The World Bank, Washington, D.C.

- Given the present level of available resources, and in order to justify increased investment in the REE system, future actions must produce noted results in the short-term which will attract public attention, restore producer confidence in the institutions, and reinforce political support of the REE system;

- The REE system should be attractive to the international technical cooperation agencies which are interested in assisting in the development of Peru.

3. Problem

The existing agricultural REE system of Peru can be characterized as inadequate, limited in scope, plagued by budgetary constraints, diverse, uncoordinated and suffering from a lack of trained professionals. Whereas several of the developing countries of Latin America have been able to increment agricultural production and consequently rural incomes through the successful transfer to the producer of recent technological advances, agricultural output by land unit in Peru basically remains at the same level as ten years ago. When one considers the potential impact on agricultural production that the successful application of recently developed advances in agricultural technology could make, the present agricultural situation represents more than stagnation; it represents a real reduction in agricultural production over levels attained by other countries.

a. Historical Prospective

In order to understand the present REE situation in Peru, it is necessary to review the history of the REE institutions and the involvement of U.S. assistance during the last few decades. The pre-1960 period was marked by the existence of institutions that were primarily dedicated to serving the large commercial haciendas of Peru. Research consisted mainly of testing and confirming improved agronomic practices. The Sociedad Nacional Agraria was the major political force in agriculture, consisting primarily of membership by the large haciendas of the coast. The Agronomist (Ingeniero Agrónomo) degree was designed as a general professional education and it conferred social status as well as educational advantage. The major research and education facility was located at the NAU and outlying test were conducted on cooperating hacienda fields. The commercialized agriculture was prosperous and on the coast was quite up to date in the use of agricultural technology. The large haciendas of the sierra were strongly feudalistic and prospered largely due to the availability of abundant indigenous labor.

The period of the mid-fifties to late-sixties was marked by a strong technical assistance program that was provided to the NAU, the National Agricultural Research Program, and to a lesser extent the National Extension Service. On November 15, 1954, a contract was signed between the Foreign Operations Administration (AID predecessor) and North Carolina State College to provide technical backstopping to strengthen the agricultural research and agricultural promotion program of Peru. North Carolina State stationed a team of technicians in Peru who, along with short-term consultants, advised and trained Peruvian counterparts in organization, administration and methods of agricultural research. The principal research efforts were toward establishing a dairy herd improvement program and initiating a pasture improvement program for the high jungle.

In 1957, a National Agricultural Research Program organized along commodity lines of basic food crops and livestock production was formed. The North Carolina Mission assisted the National Agricultural Research Program in the development of specific project activities in the various commodity programs. During this period a major training effort was initiated to provide trained personnel in the agriculture sciences. Major emphasis was placed on such commodities as potatoes, small grains, rice, corn, beans, pastures and forages. Livestock research activities were started at the NAU, backed by technical personnel from the North Carolina Mission. Additional financial support for this facet of the program came from the Rockefeller Foundation.

Through this period up to 1960 the extension activities were the responsibility of the Servicio Cooperativo Interamericano de Producción de Alimentos (SCIPA). The extension activities involved not only agricultural production but supervised agricultural credit, agricultural youth clubs and home extension programs as well. Extension personnel were continually trained in extension methodology and production technology. In 1960 a new Servicio de Investigación y Promoción Agraria (SIPA) was organized by Peru responsible for research, extension and crop and livestock development. SIPA was made up of 12 agricultural zones, each with a director who had control over the research, extension and agricultural development activities within their assigned zone.

An Iowa State University contract was signed in early 1960s to focus on land reform policy option and on development of an institutional capacity for agricultural policy analysis. A substantial amount of joint agricultural policy research was completed, a statistical base for continuing analysis was developed, a large number of Peruvians were trained abroad in economics and statistics, and an institutional capacity for continual policy analysis was established.

In the early 1960s, the North Carolina Mission began activities under a new contract to continue existing actions and to give greater assistance to the NAU. Progress continued in cereals, soils, forages and livestock. An agreement was signed between A.I.D., SIPA, NAU and the North Carolina Mission to expand the technical assistance program in the areas of teaching, research and extension with North Carolina involvement in the three areas with the NAU and the Research and Extension divisions of SIPA. The research component was developed with SIPA within the Ministry of Agriculture (MOA) and with research contracts at the NAU. The primary purpose of the activities was to further develop extension and institutional capacities. The work was oriented toward grains, forages and livestock in Southern Peru.

Concurrently a USAID, Ford Foundation and Rockefeller Foundation 10 year program was developed to enhance social sciences at NAU. North Carolina was responsible for program execution which consisted in establishing for the first time departments of economics, agricultural economics and sociology at the NAU. Project elements focussed on staff training, the initiation of socio-economic research and the development of a graduate school capacity in these disciplines.

By the mid-sixties the combined effect of these programs had produced a substantial cadre of agricultural professionals, had created a continuous flow of technological knowledge which was being disseminated through the extension service, and the institution involved began to reveal characteristics of institutional maturity.

In 1967, a new North Carolina State Mission contract was signed to continue activities which had already been established and more importantly expanded the project through the development of five commodity in-depth projects. The commodity in-depth projects were to integrate institutional programs, making use of human and physical resources of the MOA, NAU and public and private institutions.

These new programs proved to be very successful during the expanded project's next four years. Significant production increases were achieved by the end of the project and personnel had been trained and were working as a team, client groups were actively requesting expansion of the programs, and cooperative relations with SIPA and the NAU were on the increase.

A massive agrarian reform effort began with the October 1968 military revolution and in time became the number one priority within the MOA. The agrarian reform was a response to the traditional latifundio which benefitted only a small fraction of the rural population. Through the agrarian reform process the GOP redistributed agricultural land as a basis for a more equitable sharing of Peru's economic output. The result, however, was total disruption of the REE system then in place and which had been designed to serve the needs of the pre-agrarian reform agriculture (i.e. latifundio). The Revolutionary Government's attention to agrarian reform was so single minded in purpose that all financial and human resources were transferred to the reform process and the REE system developed during the previous two decades was neglected. For example, during this period SIPA was discontinued as a semi-autonomous agency in a reorganization of the MOA and its functions were assumed by the Dirección General de Investigación and the Dirección General de Promoción Agropecuaria. The REE institutions as a result lost many of their programs and more importantly most of their professional personnel. Towards the end of the late sixties it became apparent that GOP support had shifted away from programs supported by A.I.D. and other donors. USAID contracts with Iowa State University and North Carolina were, therefore, terminated in the early 1970's.

Realizing that the extension and research activities of the MOA were being neglected in favor of the agrarian reform effort, however, the MOA was divided in 1974 into the MOA and the Ministry of Food (MOF). The staffing of the newly created MOF came primarily from within the MOA, and the MOF was given the responsibility of attempting to maintain a program of agricultural extension and research. The extension effort was conducted along commodity lines through contacts with farmers who had been organized into nucleos producing that commodity. The research effort was the responsibility of the Dirección General de Investigación of the MOF with research conducted in regional and sub-regional experiment stations. The quality and consequently the impact of the research and extension activities during this time was restricted through severe budgetary constraints and the loss of trained, qualified personnel.

During this period, the number of agricultural universities had grown to 13, but their impact was limited due to frequent strikes, reduced budgets and a loss of personnel. The teaching activities, as well as the extension activities of the agricultural universities were greatly reduced as a result. In particular, the NAU, the most important agrarian university in the system, was severely affected.

In 1976, the GOP formed the Ministry of Agriculture and Food (MAF) through the merger of the MOA and the MOF. The merger was primarily an effort to consolidate increasingly scarce human resources and to reduce the bureaucratic duplicity that had developed from the creation of two agricultural ministries. The new MAF has existed from its formation through a period of extreme austerity and few improvements in agricultural extension and research activities have been possible. During this period the MAF consolidated the research personnel, facilities, equipment and budgets of the previously diverse research activities of the MAF into the National Agrarian Research Institute (INIA). The formation of INIA was an effort to avoid duplications in research activities, as well as to provide INIA freedom from some of the bureaucratic restrictions placed on agricultural research within the MAF.

The GOP now feels that it has essentially accomplished the necessary changes in the agrarian tenure structure of the country, and it is again prepared to turn its attention to the REE institutions that are required to support the development of post-reform agriculture. It is in this context that the task of rebuilding the competence and programs of research, extension and education should be viewed.

b. Current Status of the REE System

The "Baseline Study of Agricultural Research, Education and Extension" extensively evaluated the current status of the REE activities in Peru. The findings of the Baseline Study are summarized below:

i. Agricultural Research

The existing activities of agricultural research in Peru demonstrate a marked decline from the levels achieved during the mid to late 1960s as discussed above. However, the formation of INIA in 1978 represented a significant attempt by the GOP to consolidate diverse research activities and resources within one entity to conduct research on crops, livestock, forestry and wildlife, agro-industry, and water and soils resources. The Baseline Study emphasized three levels of agricultural research (physical-biological, socio-economic and agro-industrial research) as follows:

- Physical-Biological Research

Crop and livestock research is carried out at the regional level at four regional research centers and at the local level at INIA's 14 experiment stations and 29 sub-stations. During 1978 1,693 experiments were performed with emphasis on genetic improvements of various commodities, crop protection, cultural practices and fertilization. Livestock research emphasizes genetic improvement, pastures and forages. INIA also has entered into agree-

ments with several national agrarian universities for livestock, floury corn and grain legumes research.

A number of problems in the area of physical-biological research were identified by the Baseline Study, the most important of which dealt with personnel. The problems include an exodus of trained personnel, low salaries, the lack of adequate training and the assignment of responsibilities to personnel outside of their area of expertise. Also, experiment stations, laboratories and library services are poorly equipped and replacement supplies are inadequate due to insufficient budgets. Another critical problem is that there is no effective system in place to package research findings and transfer them to the extension service, and therefore, they do not reach the producer.

- Socio-economic Research

INIA has the responsibility for carrying out socio-economic studies aimed at optimizing the utilization of their research. The socio-economic unit within INIA, however, is very small and to date has not been effective.

The Baseline Study identified three major problems in the area of socio-economic research: shortage of economic resources to conduct a larger number of studies; a lack of specialized personnel to perform the studies and disseminate the research information; a lack of coherent research policy to carry out the studies and the absence of adequate salaries.

- Agro-Industrial Research

The Agro-Industrial Research Institute of INIA in coordination with the NAU has carried out a series of activities in basic and applied research on a laboratory and pilot plant scale for the utilization, preservation, and processing of agricultural, livestock, forestry and fishery commodities; the study of new procedures and methods for a rational utilization of the agrarian sector resources; and a plan for professional formation and training in the food industry to handle, study and develop locally suitable technology. Peruvian agro-industrial research is financed by a 2% contribution from net income by industrial enterprises.

The Baseline Study listed as major problems in agro-industrial research the following: a lack of coordination between private industry and official institutions; a lack of sufficient financial resources for technological research; the limited diffusion of agro-industrial research results and a loss of technicians specialized in food technology to higher paying public and private institutions.

ii. Agricultural Education and Training

The Baseline Study divided the evaluation of agricultural education and training into two sub-sections: agrarian and social science education; and rural education for agricultural producers. The current status of these two levels of agricultural education and training is described below.

- Agrarian and Social Science Education

The Peruvian University System is composed of 33 universities (23 public and 10 private), one directing and coordinating agency (Consejo Nacional de la Universidad Peruana - CONUP) and several regional councils. In 1978, the system offered 14 agronomy programs, seven animal science programs, five veterinary programs, two agricultural engineering programs, three forestry programs, four food industry programs and seven fishery programs. The eight universities surveyed in the system had 17,737 students with a total of 1,261 graduates per year. The NAU, at the present time, has the only post-graduate studies program in agriculture. University level academic programs in the social sciences include 22 in economics (one post graduate program), twelve in sociology, seven in anthropology, six in social services and three in social work. Only 15% of the 1,684 professors surveyed held post-graduate degrees. Nearly half had five years of teaching experiences or less.

The major problems identified with university education were the following: heavy teaching loads; low academic level of the professors; lack of proper preparation in scientific and teaching methodology; deficient curricula; inadequate infrastructure, equipment and libraries; deficient salaries; and a lack of employment possibilities for university graduates.

Most of the mid-level institutes for the training of agricultural technicians have disappeared over the last few years. At the present time, 13 "Higher Schools for Professional Education" which offer a professional degree following 3 years of study are in operation. In 1978, there were 3,140 students and 118 professors involved in these programs. The "Higher Schools for Professional Education" suffer from many of the same problems as do the universities: deficient curricula on technical subjects; inadequate infrastructure, equipment and libraries; and a low academic level of the teachers. Furthermore, there is a need for economic incentives and professional positions for graduates from the technical schools.

- Rural Education for Producers

Rural education for agrarian reform beneficiaries has been the responsibility of CENCIRA - Centro Nacional de Capacitación e Investigación para la Reforma Agraria (National

Center of Training and Research for the Agrarian Reform). CENCIRA operates throughout Peru with 13 regional offices. Training is provided using audio-visual aids and a closed circuit television system. Most of this equipment has been provided by foreign aid programs. In 1978 CENCIRA was reaching 5.4% of the agrarian reform beneficiaries. Training topics included cooperative management and crop and livestock technology.

CENCIRA's major problems as identified in the Baseline Study are; limited coverage of the educational services; integration and coordination between CENCIRA and the research agencies is limited; and inadequate human and financial resources.

iii. Agricultural Extension

The Baseline Study surveyed personnel at three levels of operational responsibility: the regional deputy directors of extension, the professional staff involved in extension and the sectoristas (extension agents).

The regional deputy directors are in charge of extension activities in their region. The majority are professionals with an academic degree, although some have not had previous extension experience. Some extension training for this personnel has been conducted by the MAF regional offices but this training has been limited to refresher courses in extension methodology. The deputy directors do, however, maintain a relationship with the experimental stations to obtain improved seed. The Baseline Study found that the deputy directors feel that the extension personnel are often utilized in activities not relating to extension and lack financial support for increasing their extension work.

The professional extension staff is composed of agronomists, veterinarians and livestock technicians, the majority of which have had less than 10 years of experience in extension. The study found that this group felt that a strong demand exists for their services, but that due to financial limitations and lack of up to date research information they are unable to put their extension programs into practice. The majority have not received formal extension training nor on-the-job training.

The agricultural technicians or sectoristas work as assistants to the extension professionals and maintain direct contact with the farmers. The majority of them have had less than 10 years of extension experience. The extension responsibilities of this group vary greatly and their actions are restricted by limited extension training, lack of transportation,

travel allowances, equipment and technical information. The majority of them do not maintain any organized professional relationship with researchers and are not familiar with the experiment stations. They utilize volunteer leaders in their extension work and occasionally work with rural youth. A common complaint among the sectoristas is that salaries are inadequate.

In general, the present extension system can be characterized as deficient in training and extension methodology for its personnel, restricted in operations by insufficient financial support for extension activities, having inadequate salaries and lacking coordination between those involved in extension and research.

B. Project Description

1. Goal and Purpose

The goal of the Project is to further the socio-economic development of the Peruvian small farmer so as to increase the production and income of the rural population of Peru. The Project's target group consists of small farmers and members of associated agricultural enterprises.

The purpose of the Project is to create and Agricultural Research, Extension and Education System that will enable the institutions involved in agricultural research, extension and education to:

a. Increase agricultural production by structuring the basis for enhancing and reinforcing the human resources required for agricultural research, extension and education;

b. Provide for a continual flow of varying levels of agricultural technology which meet the needs of the small and medium sized farmers, as well as those of the associative enterprises.

The overall socio-economic development of the small farmer of Peru is dependent upon the adoption of improved agricultural technology and practices. A Research Extension and Education System is essential to accomplish the transfer to the small farmer of these improved agricultural technology practices. Within the last year, the GOP has shown interest in improving the existing REE System and has recently completed a joint GOP-Title XII Baseline Study of Agricultural Research, Extension, and Education. This study recommends that an REE System be developed to combine and coordinate the resources of various existing REE institutions so as to effectively address the agricultural producer's needs in these areas (a draft translation of the Baseline Study is reproduced in Annex III Exhibit 1). The proposed Project is designed to implement the recommendations of the Baseline Study.

2. End of the Project Status

By the end of the Project, the following conditions should exist indicating achievement of the Project purpose:

a. A functioning agricultural REE system in place with REE activities coordinated by a permanent management unit responsible for developing and transferring technical information which increases agricultural production and farm incomes.

b. The agricultural output of the five commodities selected for attention under the Project will increase, imports will decrease, and a more stable supply of staple food products will be assured to the urban population.

c. The necessary human resources required to implement a dynamic agricultural REE system will be provided and reinforced through continual training of personnel as needed by the System.

d. The establishment of a flow of information between the REE system and the International Research Centers and U.S. universities to capitalize on the agricultural technology being developed by these organizations and to apply it to Peruvian production conditions.

e. The GOP will have significantly expanded its financial and technical investments to the REE system.

3. Outputs

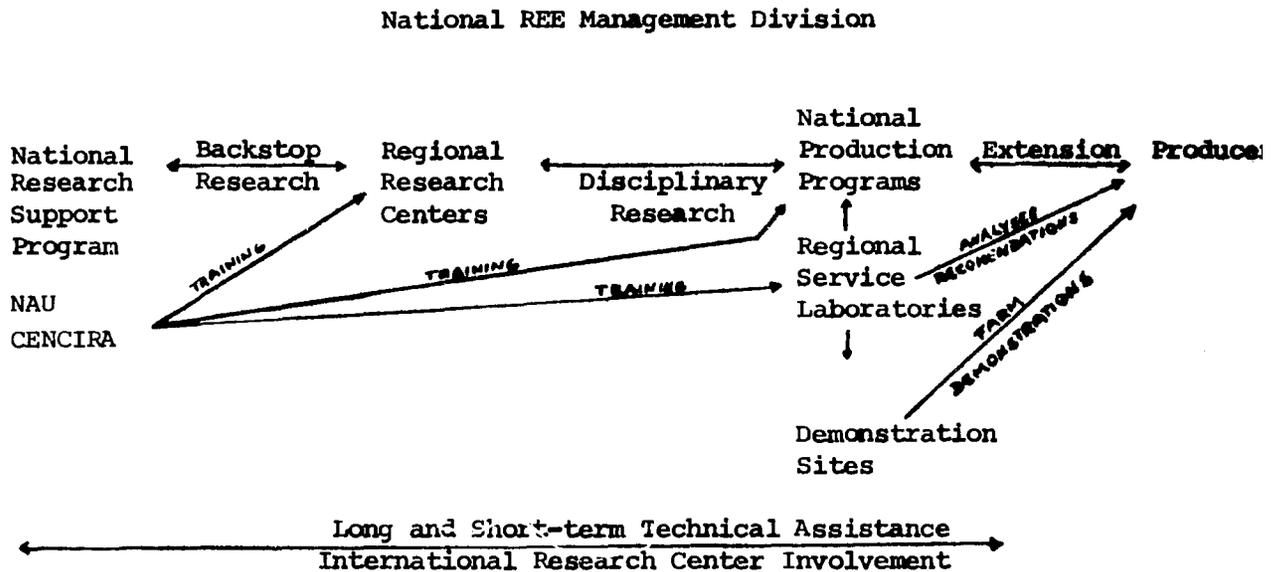
The major outputs of the REE system anticipated under the Project include the formation of: (a) five National Production Programs; (b) six Regional Service Laboratories; (c) five Regional Research Centers; (d) a National Research Support Unit; (e) an Education Program, and (f) a National REE Management Division. The Baseline Study identified these outputs as necessary to the development of the three component REE system.

4. The REE System

In accordance with the Baseline Study the design of this Project emphasizes the development of an integrated REE system rather than supporting a series of uncoordinated activities currently in place. The cost of an uncoordinated system to the GOP and to the farmer is high -- for example investment in research which is not packaged and extended to producers is a waste of scarce resources. Therefore, a key element of this Project is the creation of a National REE Management Division to direct all activities included in the REE System (Part III A for the Administrative Analysis of the National REE Management Division). This Division will assure that as the research component develops improved production technology, this information is

transmitted to the producers in an effective manner through the Project's extension activities.

The National REE Management Division will be located in Lima and will be comprised of representatives of INIA, CENCIRA, the universities, MAF and other institutions when deemed necessary. The principal responsibility of this unit will be to plan, implement and evaluate the activities of the system. The unit will also be responsible for formal and informal agreements between various institutions so as to assure the efficient and timely input of human, financial and material resources to the system. A schematic view of how the various components of the REE System will interact is presented in the following chart:



The proposed Project will strengthen the REE System by providing financial assistance for the following components:

(a) Extension

The capacity of the national extension service to develop technological extension packages and transfer the content of these packages to the farmer will be strengthened with the formation of five National Production Programs (NPPs). These programs will focus on staple cash crops which form the basic of small farm agriculture in the Sierra and high jungle. These basic commodities

are also GOP political priorities and most are currently being imported to cover existing deficits.^{1/}

The NPPs will be staffed by researchers, extension specialists, and sectoristas from INIA, universities and the MAF. They will be centered at existing INIA or university facilities with operational satellites to be located at major production centers for each commodity. The NPPs will initially prepare technical extension packages based on existing research information and transfer these packages to producers through the extension component of the REE system. The researchers of each NPP will continue to perform commodity specific applied research, the results of which will be included in a steady stream of extension packages for the extension program. The researchers will visit individual farms in carrying out their responsibilities.

The commodities to be included under the Project are the following: rice, corn, potatoes, grain legumes and small grains (barley and wheat). The selection criteria used to determine commodities eligible for the Project is discussed in Part III. E. Technical Analysis of this paper. These production programs will be concentrated in the major production areas of each crop, with four satellite centers covering as much of the total geographic production area as possible. Each NPP will be able to directly extend technical information to approximately 25,000 farm families (See Part III E for extension outreach). The NPPs will be staffed with teams of 36 individuals consisting of the following personnel:

- 1 team leader located at the NPP center;
- 6 applied researchers located at the NPP center;
- 4 extension specialists located at the NPP center;
- and
- 25 sectoristas with 5 located at the NPP center and 5 located at each of the satellite centers.

These staffing levels may be adjusted by placing personnel in a particular NPP that requires additional support and reducing other NPPs that may not require the proposed levels. Members of the team will be selected, by the National REE Management Division, based on their technical knowledge, prior experience and practical knowledge of the commodity's production characteristics.

The personnel will be assigned to the teams on permanent detail from the various agencies participating in the Project and will work exclusively for the Project. They will be responsible to the team leader and through him to the National REE Management Division. The team leader will coordinate and direct the NPP activities. Initially the team will develop extension packages

^{1/} See Part II Technical analysis for crop selection rationale.

utilizing research information already available. This will allow for rapid start up of the extension component and allow for the quick impact needed to gain further support for the REE system. The extension specialists role will involve receiving the technical information developed by the research centers and preparing the extension packages with which he will train the sectoristas in the specific technology to be transferred to the producer. The sectoristas working from the satellite centers will extend components of the extension packages to the producer through individual visits, visit to farm leaders, on farm demonstrations, producer meetings, pamphlets and field days. Sectoristas will collect information on the farmer's commodity production costs and yield levels before application of the technological extension packages, as well as after their application to assist in the evaluation of their effectiveness. This information will be passed to the agricultural economists in the Regional Research Centers for impact analysis and transmission to the Lima-based National REE Management Division. Through close contact with the farmers, the sectoristas will identify potential problem areas requiring continued applied research. The extension specialists will be responsible for continuous updating of the extension packages to reflect new research results and will frequently visit individual farms at the satellites with the researchers to further direct research activities. Such activities will facilitate direct communication between the farmers and all NPP team members.

The exact location of the centers and satellites for each NPP was chosen taking into consideration the major areas of production of the particular commodity and the existing infrastructure available. They are as follows:

<u>PRODUCT</u>	<u>CENTER</u>	<u>SATELLITES</u>
Rice	Chiclayo	Piura, Jaen, Tarapoto, Yurimaguas
Potatoes	Huancayo	Cajamarca, Ayacucho, Cuzco, ^{1/} Cafete
Corn	La Molina	Huaraz, ^{1/} Huancayo, ^{1/} Cuzco, ^{1/} Satipo
Grain Legumes	Huancayo	Cuzco, Cajamarca, Ica, Tarapoto ^{1/}
Small Grains	Huaraz	Huancayo, Cajamarca, Puno, Ayacucho

The requirements of the NPPs are based on the institutional and administrative analysis included in Part III. A. The nature of the proposed assistance at the various levels is discussed below.

^{1/} Includes research being carried out under USAID Grant (527-0149) Soybean and Corn Production on Small Farms.

^{2/} See Part III Section E for description of crop selection rational.

i. NPPs Formation and Personnel Training

Project start-up activities will involve selection, orientation and basic training of the present sector personnel who will be incorporated into the staff of the five NPPs. The team leaders will be chosen based on experience in the principal commodity or commodities produced in their area of influence, as well as on their administrative experience. The applied researchers will be chosen from INIA and selected universities based on applied research experience. The extension specialists will be selected from the MAF based on their knowledge of extension methodology and experience in providing extension services. The sectoristas for each NPP will be chosen from the MAF based on their field experience. The individuals from each NPP will be brought together at the Central location of the NPP to pool their resources in the preparation of the extension packages for the particular commodity based on existing information and practical experience.

A priority activity will be the training of the individuals involved in the five NPPs. In the first year, all 36 individuals of each NPP will receive 30 days of training in extension and 15 days of training in research. Short courses will be prepared by NAU in collaboration with the MAF and INIA, utilizing the training facilities of CENCIRA. Extension and research personnel will receive dual training in both extension and research methodology. The purpose of this dual training approach is to increase awareness of the team members to the interrelationships and contributions of the different components of the REE system to assure an information flow up and down the system as the Project progresses. During the second year of the Project, the team leader, the researchers and the extension specialists will receive 30 days of extension training and 30 days of research training. The 25 sectoristas will receive 15 days of extension training to update them in the latest advances of the production of a specific commodity. In the third year, the team leader, researchers and extension specialists will receive 15 days of extension training and 15 days of research training. The 25 sectoristas will receive 15 days of extension training.

In addition to the non-degree training, one extension specialist and one researcher from each NPP will participate in a program of post-graduate studies at the NAU. This training will take place in Project years one and three and will cover areas such as genetics, soil fertility, crop production and extension methodology. Upon completion of their long term training, the Project personnel will return to their respective NPPs. A general requirement for training will be a signed contract, which will require that the trainee work for two years with the REE program for each year of long-term training received. The dispersed production regions of the five

commodities extend beyond the areas of influence of the NPP centers and satellites. For that reason in the third, fourth, and fifth year of the Project, up to 500 extension specialists and sectoristas working in the five selected commodities, but in areas not covered by the NPP centers and satellites will receive two weeks of training at the NPP centers or satellites nearest them. The two week training will emphasize extension methodology. The sectoristas will also acquire information regarding the various extension packages already developed through bulletins and other printed material developed under the Project. This material will be disseminated to appropriate extension agents and sectoristas throughout the country. This training is inexpensive and will greatly expand the impact of the NPPs to a maximum number of small farmers. At the end of the Project 500 additional extensionists will have received short-term training and printed information and will have reached an estimated 100,000 farm families.

ii. Procurement

In order to enable the rapid implementation of the NPPs, selected start-up costs will be covered by the Project. Four vehicles will be provided to each NPP and 1 vehicle per satellite location. In addition to these vehicles three motorcycles per NPP satellite will be purchased for the sectoristas. Minor construction or repair of physical plant facilities needed to support each NPP will also be necessary, as will field equipment for research and extension activities and communication equipment such as cameras, projectors, demonstration materials and visual aids development equipment.

iii. Support Costs

The implementation of the IMF imposed austerity program and the time-lag in the budgeting process make it imperative that the Project pick up selected support costs of the NPPs during the early phases of the Project. These support costs will be on a declining basis so that at the conclusion of the Project the GOP will be able to fully assume the required costs (See Part III Financial Section). Thus, the Project will provide library support for the NPP centers, extension publication costs, research and extension support, operation and maintenance support for vehicles purchased under the Project, as well as salary incentives.

iv. Technical Assistance

The Project's Administrative analysis concludes that the technical staffs of the entities to be involved in the NPP operation are reasonably well equipped to conduct the NPP activities. Through additional training to be provided by the Project to the individuals of each NPP, their research and extension capacities will

be further enhanced. The Peruvian technical effort will be complemented by short-term technical assistance from international research centers and U.S. universities. The primary focus of the technical assistance provided will be: to address specific research questions, to update the packages, to prepare the extension packages and to develop appropriate methods for the extension to the small farmer. The International Research Centers (CIP, CIAT, CYMMIT, IRRI) have also developed technological extension packages for various commodities and are anxious to adopt the packages to the necessities of developing countries such as Peru. An estimated 46 man months of short-term T.A. has been budgeted for this purpose.

The Project will establish six Regional Service Laboratories to supply soil, water and plant and animal tissue analysis services to producers through the sectoristas. These analysis will be provided on a fee basis to the producer. Recommendations for fertilizer, lime and pesticide use based on these analysis will assist in assuring the timely and efficient application of the production guidelines contained in the technological extension packages developed by the NPPs.

The Regional Service Laboratories will be housed at existing MAF facilities selected to maximize their accessibility to farmer-recipients of NPPs' services. Based on the locations of the five NPP centers and their satellites, the six laboratories will be located at: Cajamarca, Huancayo, Cuzco, Tarapoto, Satipo and Huaraz. Each laboratory will be staffed by six people: four laboratory technicians and two agronomists to prepare recommendations based on the lab analysis. These individuals will be employees of the MAF assigned permanently to the Regional Service Laboratories.

The Project will provide assistance to the Regional Service Laboratories as follows:

- Procurement

To provide transportation for the outreach activities of the Regional Service Laboratories, the Project will purchase one vehicle for each laboratory. The Project will also equip the six laboratories with the analysis equipment, reagents and expendable goods necessary to carry out the analysis. Funding will also be provided for improvements of the MAF physical facilities as necessary to house the six regional laboratories.

- Training of Regional Service Laboratory

Personnel

The six individuals from each of the six Regional Service Laboratories will receive informal training for 30

days each year during the life of the Project. The training for the first year for the technicians will consist primarily in the operation of the equipment; for the agronomists it will consist of analysis interpretation. Subsequent training will emphasize refresher courses in these same areas, as well as troubleshooting and interpretation of analysis and will be of 30 days duration. Training will be prepared and executed by the NAU.

- Provision and Support Costs

The Project will assume support costs for the operation of the six Regional Service Laboratories. Such expenses as operating expenses, vehicle maintenance and operation, and salary incentives will be financed by the Project on a declining basis such that the GOP will have assumed these costs by the end of the Project.

(b) Research

A sustained increase in food production in the future will be required if Peruvian agriculture is to provide the savings in foreign exchange and supply the food necessary to support its development goals. Food supplies, in the Peruvian context, can be expanded by either bringing additional land into cultivation or through better utilization of existing cultivable land. USAID/Peru strategy aims at both, i.e. the sub-tropical lands project is bringing new land into production, but in order to sustain increased agricultural output it is imperative that the utilization of existing farm land be intensified through the utilization of modern technologies such as fertilizer use, improved crop varieties, weed and pest control and mechanization. The successful transfer of the extension packages developed by each NPP will result in the increase in food production of the selected commodities. However, a continual flow of additional information must be developed to assure the successful application of the extension packages of each NPP to regions of varying soil fertility, irrigation and drainage conditions, different plant pest problems and varying economic production situations (i.e. access to markets). This development of disciplinary information is a primary research task. The development of this research capability is essential to provide a continual flow of information to the extension personnel and on to the producers.

The current Peruvian economic difficulties have been exacerbated by the negative agricultural trade balances which have tended to slow the economic recovery process. Peru cannot afford either the time nor the resources necessary to develop a basic research capability to supply the technical information required and, therefore, must concentrate on the development of an applied research capability as proposed under this Project. This strategy is based on the premise that Peru can take advantage of a large body of

fundamental scientific principles and methodological know-how built up in other countries over the years. The Project will adapt this information and experience through an applied research program oriented to the Peruvian production situation.

The research activities of the Project will be conducted simultaneously at three levels. Initially, the researchers of each NPP will develop the extension packages based on identified production constraints and existing technical information and will continually update this information. The transfer of the information will be performed by the sectoristas through on-farm testing. This activity will allow for immediate Project impact on farmers. Concurrently, the researchers at the regional level will improve the extension packages by conducting applied disciplinary research at the Regional Research Centers which will allow for a broader application of the extension packages. The researchers at the national level will provide backstopping to the other levels and will also conduct research activities to lay a foundation for the expansion of the NPPs to other commodities beyond those included in the Project. In addition, the national research support unit will disseminate research findings beyond the region where the activities were conducted. Project activities under this component will include:

i. Research Centers

Given the diverse ecological conditions of the country, it is necessary to provide pertinent information to the five NPP teams on soil management, irrigation and drainage, plant protection, etc. at five Regional Research Centers located near the satellite areas of the NPPs. These Regional Research Centers will be housed at existing INIA facilities and will be staffed by INIA and university personnel. The Regional Research Center will be located as follows:

<u>Location</u>	<u>Facility</u>	<u>Coordinating Institution</u>
Huancayo	INIA Experiment Station - Huancayo	National University of the Center of Peru - Huancayo
Chiclayo	INIA Experiment Station - Chiclayo	National University Pedro Ruiz Gallo
Tarapoto	INIA Experiment Station - Tarapoto	Yurimaguas Sub-Experiment Station ^{1/}
La Molina	INIA Experiment Station - La Molina	National Agrarian University "La Molina"
Arequipa	INIA Experiment Station - Arequipa	Cusco Sub-Experiment Station ^{2/}

The Regional Research Centers will apply the extension packages developed by the NPPs and will direct applied research toward varying conditions of soil management, water requirements and insect and disease control. Research requirements as identified by the various NPP teams will be given first research priority and the research results will be incorporated into the respective technological extension packages. The Regional Research Centers will also perform economic analysis of the Project's impact by employing agricultural economists at the Centers to collect production cost

^{1/} Yurimaguas Sub-Station will provide low jungle tropical research information into the REE system. That on going research is being provided by an A.I.D. supported contract between INIA and North Carolina State University entitled Tropical Soils Management.

^{2/} Research at Cusco Sub-Experiment Station also support by USAID Grant (527-0149) Soybean and Corn Production on Small Farms.

data where extension packages have been adopted. Through careful analysis of these data, adjustments in the various components of the extension packages will be made.

The nature of the Project assistance to this component is discussed below:

- Training and Staffing

Through agreements between INIA and the various national agrarian universities, teams of applied researchers will be named to conduct the research of the Regional Research Centers. Individuals will be selected based on past research experience and the research requirements of each Regional Research Center.

Once the research teams have been selected, a training program will be initiated to strengthen the research capability of the Regional Research Centers. One researcher per center will receive in country, non-degree training at the NAU for a period of one year. This training is primarily to update the researchers in the latest agricultural research methods, experimental design and statistical analysis. Once the researchers have completed their training, they will return to their respective centers.

Additionally, one researcher per center will receive two years training toward a MS degree at the NAU with specialization in the areas of soil fertility and management, crop improvement, pest control and water management. Such training will strengthen the research capacity of each Regional Research Center as the applied researchers return to their respective Centers to assist in the research effort.

- Equipment needs

The Project will finance the procurement of three vehicles per Regional Research Center. The Project will also purchase limited quantities of field machinery and laboratory equipment to assist in the research effort at each Center. A limited amount of facility improvement will also be financed at each Center to accommodate the research activities to be financed under the Project.

- Support Cost 1/

The Project will finance the following support costs on a declining basis, for each of the six Regional Research Centers: research budget support costs, library support costs 2/ and salary incentives for personnel involved in Project associated research.

1/ Research support costs include funding for a) travel and per diem, b) purchase of seeds, fertilizers, and other inputs for the conduction of research activities, and c) expendable laboratory materials, such as reagents, glassware and combustibles.

2/ Library support costs include funding for a) purchase of technical reference materials and b) subscriptions to technical periodicals.

- Technical Assistance

Short-term technical assistance will be provided by the Project as necessary to assist in the research programs of the Centers. TA will be provided from the U.S. universities associated with the Project as well as from the International Research Centers. Major emphasis for the short-term T.A. will be to address specific research problems encountered by the applied researchers of the Centers, and for that reason the T.A. need can be met by short-term rather than long-term T.A. services. An estimated 15 man months have been budgeted for this activity.

ii. National Research Support Unit

It will be necessary to develop a national research support unit with expertise in such areas as genetics, plant pathology, entomology, natural resource management, agro-industry, etc., as the Regional Research Centers develop the capacity to conduct applied research in support of the NPP. The purpose of the National Research Support Unit will be two-fold: First, the Unit will provide specific technical research information required by the Regional Research Centers and will disseminate the research information developed in one region of the country to other regions. The Unit will serve as support to the Regional Research Centers by continuing the flow of research information at a level beyond the capacity of the Centers and will be incorporated into the regional research programs and eventually the NPP. Secondly, the Unit will conduct research on other specific commodities not included in the commodities selected for the initial NPP in order to develop a knowledge base for future expansion of the NPP commodity program. The National Research Support Unit will also direct an applied research effort toward agricultural research in other areas of general agricultural interest, such as the low jungle.^{1/}

The National Research Support Unit will be responsible to INIA and receive assistance from the NAU and selected regional agricultural universities. Approximately 50 researchers will participate in the activities of the Unit. They will receive research assignments and supervision from INIA in specific research problems. Research results will be passed to INIA for incorporation into the extension packages for dissemination.

^{1/} Refers to on going research activities in Tropical Soils Management (INIA - North Carolina State University).

The National Research Support Unit will initiate activities in the second Project year. While it is obvious that the results of these activities will only begin to be available by the end of the Project, it is important that a research capability be established so as to continue serving the needs of the Regional Research Centers and INIA following Project completion. The Project will finance the following activities under this component:

- Training

Technical capability presently exists within INIA and the universities in a variety of disciplines. However, due to the wide range of disciplines contemplated in this research effort, the Project will finance long-term foreign training for five researchers from the MS to the Ph.D. level. The researchers will be selected by INIA during the first Project year based on the Project's anticipated research needs. The researchers will return to their respective institutions following their training and will be incorporated into the on-going research effort.

- Short Term Technical Assistance

Short-term technical assistance will be provided by the Project, as necessary, to address specific research problems encountered by the National Research Support Unit. Of primary importance will be assistance in the preparation of the research activities, and the evaluation of research results. An estimated 15 man months of short-term TDY assistance will support this facet of the Project.

- Equipment Needs and Facility Improvement

The Project will finance the procurement of research equipment for research efforts. Equipment will include laboratory equipment for sample preparation and analysis, field data collection equipment and field research plot equipment. In many cases, it will not be necessary to purchase new equipment, but to restore existing equipment to working condition. This will require mainly the purchase of replacement parts and accessories. The Project will also finance a modest amount of facility improvement for the National Research Support Unit. For example, as new equipment is installed, it will be necessary to modify existing installations to accommodate the equipment.

- Support Costs

The Project will finance the following support costs, on a declining basis, for the National Research Support Unit: research budget support costs, library support costs

and salary incentives for personnel involved in research associated with the Project.

iii. Demonstration Sites

Because the Regional Research Centers will be select in personnel as well as physical resources, it is important to indicate the role to be played by existing research/demonstration facilities. Additional, outreach from the Regional Research Centers will be provided by other INIA research facilities. Five existing research sites have been selected to provide support operations for the system. The experiment station sites are as follows:

<u>Experiment Station</u>	<u>Location</u>
Huaraz	Sierra
Cusco	Sierra
Puno	High Plains
Tulumayo	High Jungle
Cajamarca	Sierra

The involvement of these experimental stations and their personnel will be through the production of improved seed and genetic stock. This activity offers relatively un-trained personnel the opportunity to learn practical aspects of production. Personnel who prove to be particularly promising in these centers will be offered the opportunity of advancement into higher paying positions in existing and future NPPs.

Finally these research sites will be utilized as demonstration sites for the application of the extension packages in regions where the particular commodity is produced, but which is not included in the Project's direct geographic coverage. This will provide increased exposure of the extension packages to approximately 5,000 additional farm families attending field days to be arranged at these sites.^{1/} They will allow for an evaluation of the applicability to more diverse production areas of Peru of the extension package.

The assistance to the demonstration sites will be through the provision of: annual operational support costs for improved seed production, production costs for the application of the extension packages from the NPP and costs associated with the organization and execution of field days and demonstrations.

^{1/} The IDB project provides financing for this type of activity and will therefore complement the A.I.D. effort (See Section II c for discussion of IDB project).

(c) Education

The Baseline Study emphasized the importance of including the national agricultural universities within the proposed REE system. University personnel will be involved in the Project as members of various NPP and research programs, however, the major university involvement in the Project will be through the provision of training at the NAU for Project personnel at various levels of the system. The NAU currently has the only agricultural graduate program in Peru and possesses faculty depth to provide, with only limited assistance, advanced training to the personnel from the research and NPP components. Training at the NAU will not only be more applicable to the actual situations of Peru than foreign training, but will also be less expensive. Through training of the research NPP personnel at the NAU, they will receive the required technical skills to contribute to the REE System.

The Project will finance the following activities under the education component:

- Training Equipment and Facility Improvement

Training equipment will be purchased to accommodate the additional training to be done by the NAU. Such items as slide projectors, audio-visual materials and class room training equipment will be purchased under the Loan. Also a modest amount of training facility improvement will be provided by the Project to upgrade and adapt the present facilities to the increased training demand.

- Short-term training

A total of approximately 20 researchers from the regional agricultural universities and INIA will receive one-year training in their particular speciality to upgrade their research capability. They will also be brought up to date in the latest technical information in order to improve their effectiveness as teachers in their respective universities and as researchers with INIA. Five researchers per year will receive one-year training from year one to year four of the Project in such areas as research methodology, rural sociology, agricultural economics and crop specific agronomy. Those researchers to receive the short-term training will be nominated by the various universities and INIA. The final decision as to which researchers are to be trained will be made by the National REE Management Division.

- Long-Term Foreign Training

Five faculty members of the graduate school at the NAU will receive Ph.D. training at U.S., or third country

universities, in order to upgrade the NAU's training capability. The NAU in particular, has lost a large number of its highly trained personnel over the past decade and a reinforcing of the training capacity of the graduate school is imperative to the effectiveness of the REE system. Areas of training will include agricultural economics, genetics, plant pathology, entomology and soil fertility among others. The selection of individuals for the advanced training will rest with the National REE Management Division based on recommendations of the NAU.

- Support Costs

The GOP's current fiscal austerity program precludes GOP financing of a number of support costs, particularly during the Project's first years. These costs will be assumed by the Loan on a declining basis. Library support costs covered by the Project will help upgrade the library's utility to the individuals from the MPP, the Regional Research Centers, INIA and the regional universities who will receive training at the NAU. Salary incentives for the NAU personnel involved at various levels of the training activities of the Project will also be provided, again on a declining basis through the life of Project.

- Technical Assistance

Short-term foreign technical assistance will be provided to the NAU reinforcing their existing training capability. Primary importance will be short-term seminars provided by the Title XII University on specific topics to strengthen such areas of interest as research and extension methodology, specific agronomic topic, agricultural economics, etc. Short-term foreign technical assistance will also address curriculum development and teaching methodologies. An estimated 18 man months of TA assistance will be utilized in support of this component.

C. USAID Assistance Strategy

1. Relationship to Mission CDSS Strategy

The Mission's latest CDSS stated that Peru's short-term imperatives are to restore economic growth, to manage the transition to civilian government, and to reduce the suffering of the poor during the current slow economic recovery.

Looking at the long-term objective of moving Peruvian poor out of absolute poverty, the role of A.I.D. along with other donors during the years of the CDSS planning cycle is to fill the gap between Peru's strong commitment to the poor and its weak fiscal position. We must realize that the actions Peru has taken to control inflation and restore economic growth have, in the short-run, reduced

the government's ability to carry out programs for the poor. Without foreign assistance during this period, the position of the poor will worsen and even the most promising of the reforms implemented in Peru over the past 10 years will not realize their equity potential.

The Mission's strategy for Sierra and high jungle-growth focuses on programs for food production, agricultural development, rural infrastructure and off-farm employment to increase the economic value-added of non-coastal agriculture, foster agriculture-related economic growth and raise income of the rural poor. A.I.D. resources are being concentrated in sierra/high jungle sub-regions which demonstrate the greatest productive capacity. Two sub-regions -- Junin and Cajamarca/San Martin -- are further described in the CDSS and possible future concentration in the regions of Pasco-Huanuco and Puno is also described. The proposed Project will direct a significant amount of Project funds to the Mission's priority regions; However, given the national coverage of which the REE system must have in order to accomplish its objectives, the Project will also impact on other poor areas.

2. Relationship to Current Mission Programs

The Mission proposes under this Project to finance the development of an agricultural research, extension and education (REE) system which will complement other ongoing USAID projects in Peru. Through regional development projects in the high jungle and two departments of the sierra, transportation infrastructure is being developed to assure access to agricultural production areas. The improved agricultural production information developed as a result of the REE system will be transferred to some of the producers of the sierra presently benefitting from new and improved irrigation practices provided by the Sierra Irrigation Loan. Increased agricultural production as a result of the successful operation of the REE system may be processed through agro-industrial sub-projects of the rediscount window of the Central Reserve Bank of Peru. The Rural Enterprises loan can provide financing for implements, transportation and marketing services which will assist in the utilization of the improved technological practices, as well as the movement of increased production resulting from the successful transfer of production information. Agricultural credit from the A.I.D. financed BANCOOP grant project will be available to provide production credit to producers benefitting from the Project.

Information developed by the "Soy and Corn Production on Small Farms" grant will be valuable in the preparation of the corn and grain legume extension packages and the training provided to research and extension personnel will contribute to the quality of such activities when these individuals become involved in the Project. The centrally funded "Tropical Soils Management" project

in Yurimaguas will provide background information which will aid in the application of the extension packages to the low jungle. The Mission will sign up a soil conservation grant in FY 80 to develop the basis for soil conservation program in many of the regions of Peru where the Project is active.

3. Other Donor Activity

i. The Inter-American Development Bank (IDB)

Project success will be enhanced by careful coordination with other donor activities related to the REE System. Currently, the most important projects impacting on the REE system are two IDB projects.

An \$8.6 million IDB SPTF grant in agricultural technology transfer and seed improvement was signed with the GOP in 1978. The project involves the transfer of technology through field demonstration of floury corn, dent corn, potatoes, rice, sorghum, dual purpose cattle and sheep. The project will also produce improved potatoes and floury corn seed to promote improved seed use. The IDB project has had major initial implementation problems, primarily due to the lack of an adequate organizational structure. The A.I.D. Project, which implements recommendations made by the Title XII Baseline Study, will provide the organizational structure through the formation of the REE System which establishes the basis necessary for the IDB project to reach its full potential. The Mission views the IDB project as complementary to the activities of the Project and close coordination will assure that the agricultural technology developed through the A.I.D. sponsored Project will be transferred to these additional agricultural producers. The extension packages of common interest to both projects developed by the NPPs will also be utilized in the IDB field demonstrations. The field demonstrations will increase the exposure of the extension packages and the improved seeds will be of mutual benefit to both projects. Further, the A.I.D. Project provides for continued research in the commodities of interest which will provide additional production information to continually update the extension packages. Such research back-up is not provided by the IDB project. Additionally the Project finances analysis facilities and training of researchers which, over time, will also benefit the IDB project.

The second IDB Project involves an \$8 million loan to the GOP and a \$4 million counterpart contribution for the improvement and expansion of the NAU. \$2 million of the loan will be used to develop three regional training institutes (one each for the coast, sierra and jungle) to be used for professional training. The remainder of the funds will be utilized to improve the NAU physical plant through the rehabilitation of facilities damaged by the 1974 earthquake. This project is directly complementary to the REE Project in that it will further increase the NAU's capacity to function as an efficient training center.

ii. Other Donor Activity

In 1978, 83 projects were in operation in the agricultural sector involving 25 donor sources including both bilateral, international agencies and multinational enterprises. Of the 83 projects, 60 were grant project (totaling approximately \$3 million) with 15% supporting agricultural research and 85% financing activities in the area of agricultural education and extension. The remaining 20 projects were loan financed with nearly 80% of the financing being invested in irrigation projects.

These other donor activities in the agricultural sector will be complementary to the REE System. Indeed, the creation of the REE system as envisaged by the A.I.D. Project will greatly enhance Peru's ability to fully utilize these diverse, and otherwise uncoordinated, sources of financing. For example, the loan financed irrigation projects will expand the agricultural area where the technical extension packages developed by the NPPs will be applied. A number of grant projects involve livestock, pasture and forestry research and production, and will provide the REE System with information that can increase the REE System's coverage to commodities not directly addressed by the Project at this time. Furthermore, research and extension projects involving the same commodities as those which will be promoted by the NPPs (i.e. the Canadian wheat project in Puno and the West German Lupine project in the Sierra) will be important in increasing the knowledge base for those particular commodities. This will shorten the time required for preparation of the extension packages, thereby facilitating a more rapid transfer of improved agricultural technology to the producer. The MAF has determined that ongoing

and future other donor activities in the areas of agricultural research, extension and education will be reviewed, prioritized and implemented by the REE Management Division. This type of close contact between projects will assure maximum coordination and avoid duplication of efforts as all activities will be implemented in support of the REE System. The GOP through the REE Management Division will be in a position to identify areas requiring increased support or expansion and will be able to solicit specific support from donors to answer the needs of the REE System. At this time, the IDB financed agricultural technology transfer and seed improvement grant is being restructured to permit implementation by the REE Management Unit. Other donor projects will be transferred to the REE Management Unit for implementation as well.

1/ See Annex III exhibit 6 for a list of other donor activities.

III. PROJECT ANALYSIS

A. Administrative Feasibility

1. Institutional Background and Organization

a. Institutional Background

To view the present inadequate and deplorable state of REE institutions requires a brief historical digression. Pre-1950 agricultural institutions were structured to serve a limited clientel comprised of large commercial haciendas, as well as related factors and product marketing firms. The shift away from this clientel was initiated in the late 50's and early 60's with efforts to build research, extension and agricultural educational capacities to serve varying groups. By the late 1960's various measures suggested that increased capacities existed to adapt research knowledge to Peruvian conditions and a system was emerging to deliver technical options to a clientel.

group extending from subsistence, to small and medium and large farmers. A major component of this emerging capacity was that of an experienced administrative structure.

In the 1960's a third phase for the REE institutions involved a focus on asset redistribution. The extent of the political decision to alter the asset structure was at the expense of institutions that were built and beginning to function in the previous period. For various reasons the REE institutional structure was neglected by a lack of budgetary and political support. The consequence was a loss of programs, trained human resources and the beginning of an uncoordinated set of REE institutions.

At this time, much evidence exists and a clear political decision has been taken that attention should be re-directed to these REE institutions. The objective is to increase the contribution of the agricultural sector to the total economy of Peru.

b. Institutional Organization

The major institutions involved in providing REE services are the following: The Ministry of Agriculture and Food (MAF) acting through its own departments and semi-autonomous agencies, and the national university system comprised of the National Agrarian University (NAU) located in Lima and the 13 regional universities with agricultural facilities.

i. The Ministry of Agriculture and Food

The following institutions are part of the Ministry system: The Instituto Nacional de Investigación Agraria (INIA), and the Centro Nacional de Capacitación e Investigación para la Reforma Agraria (CENCIRA).

INIA is a newly created semi-autonomous organization with responsibility for conducting and directing the agricultural research of Peru and carrying out research through a series of regional research centers and sub-research stations. However, INIA is operating with scarce operating funds, limited technical personnel, and poorly equipped research facilities.

CENCIRA's major role is to organize the operation of the associative enterprises formed by the agrarian reform. In addition CENCIRA carries out an extension function with their major emphasis being on assistance to the agrarian cooperatives formed by the Agrarian Reform. The Baseline Study reported that CENCIRA had direct contact with only 5.4% of the agrarian reform beneficiaries during 1978. Through numerous technical assistance programs CENCIRA is adequately equipped with audio visual materials, but lacks sufficient trained personnel and operating funds.

The major responsibility for extension lies with the MAF. Extension services are based on commodity programs at the regional level. The extensionists are poorly prepared not only in technical information to extend, but also in extension; the Baseline Study reports that only 23% have received some extension training. Only 15% of the sectoristas (agricultural technicians) have had more than 10 years of service in extension and over 38% of the sectoristas have contact with agricultural researchers. The extension effort is further constrained by a lack of sufficient operating funds, transport and extension equipment.

ii. The National University System

The National Agrarian University (NAU) and the agricultural faculties at 13 provincial universities make up the national agricultural university system. The NAU has the only agricultural graduate program in Peru with graduate training in 12 academic areas in addition to its undergraduate program. The NAU has suffered from a reduction in faculty members and operating expenses and a deterioration of physical facilities. The 13 provincial universities prepare bachelor level technicians in a number of disciplines and are generally restricted in their productivity by poorly trained faculty, limited facilities and inadequate operating funds. Both NAU and the provincial universities maintain limited programs in agricultural research and extension with their emphasis being restricted to the immediate areas of influence surrounding the universities.

2. Administrative Analysis of the Implementing Agencies

The major institutions involved in providing REE services are described below:

a. The National Institute for Agriculture Research (INIA)

INIA was created in 1978 by the Agricultural Sector Law N° 2232 as an autonomous and decentralized public entity and started its operations early in 1979.

The following are the objectives of the INIA:

- To develop scientific and technological information in order to attain a rational exploitation, utilization and conservation of Agrarian Sector resources.
- To generate appropriate technologies to facilitate sustained growth in agricultural production.
- To develop appropriate agro-industry technologies oriented toward better utilization, conservation and transformation of agricultural products.

- To contribute to the improvement of the nutritional levels and patterns of the population.

As shown by its organizational chart (See Annex III Exhibit 3) INIA is administered by an Executive Council headed by a President who is appointed by the Minister of Agriculture and Food and composed of four Director Generals corresponding to the Ministry of Agriculture and Food: General Directorates of Agriculture and Livestock, Water and Soil, Forestry and Fauna and Marketing.

INIA has four regional research centers and three forest and fauna research centers. The former, through a network of fourteen experimental stations, carry out research programs with priorities oriented to the solution of technological problems in crop development and livestock. Also through the experimental stations, adoption and transfer of appropriate technologies, including the development of improved seeds, are accomplished. Similarly, the FFRC's presently use six Experimental Stations, four of which are located in the sierra and two in the jungle. Establishment of additional experimental stations on the coast is under review. INIA is also responsible for the Agro-Industrial Research Institute. Its objective is to execute, on a national level, technological research in food technology related to better utilization, conservation, and transformation of agrarian products.

INIA's budget for 1979 shows receipts of \$880.6 million derived from three sources: (1) The public treasury, (2) operational income, and (3) international debt (See budget below).

National Institute for Agricultural Research
1979 BUDGET
(Millions of Soles)

	TREASURY	OPERATIONAL INCOME	INTRNL. DEBT	TOTAL
Wages and Salaries	463.3	22.8	-	459.1
Goods	15.9	73.9	-	89.8
Services	18.2	37.8	-	56.0
Studies	39.3	12.0	10.6	61.9
Works	117.2	20.0	18.4	155.6
Social Security Transfers	23.5	8.7	-	32.2
Equipment and Machinery	21.7	4.3	-	26.0
TOTAL	672.1	179.5	29.0	880.6
	76%	20%	4%	100%

At the present time INIA has 1,758 positions comprised of professionals and specialized workers of which over 50% are based in the field offices.

b. The Ministry of Agriculture and Food (MAF)

The MAF was reorganized in 1978 by combining the long established Ministry of Agriculture with the more recent Ministry of Food in order to eliminate overlapping responsibilities. Within the MAF, the General Directorate of Agriculture and Livestock (GDAL) is responsible for the promotion, supervision and control of national agricultural production and livestock. Specifically, some of the functions of the above mentioned Directorate are the following:

- To prepare the Program of National Agricultural Production.
- To determine the required inputs, financial resources and services needed for agricultural production.
- To orient, support, supervise and control technical assistance activities and the transfer of technology required to increase production levels.
- To advise and supervise the formation of peasant entrepreneurial associations and the transfer of technology required to increase production levels.
- To advise and supervise the formation of peasant entrepreneurial associations and the development of all agricultural production units.

Organizationally, the GDAL reports to the Director Superior of the MAF. Its field work is implemented through four Divisions: (1) Division of Agriculture, (2) Division of Livestock, (3) Division of Peasant Entrepreneurial Associations and (4) Division of Agricultural Sanitation (See Annex III, Exhibit 4). To carry out its functions the GDAL receives annual budgetary allocations from the Public Treasury. The budget below shows by line item the allocations made to the Lima office of the GDAL for the period 1977 to 1979.

TABLE 1

Budgetary Allocations for the Lima Office
General Directorate of Agriculture and Livestock
 1977 - 1979
 (In millions of soles)

	<u>1977</u>	<u>1978</u>	<u>1979</u>
Wages and Salaries	76.3	75.9	131.5
Goods	75.4	94.5	12.4
Services	11.2	17.4	6.9
Social Security Transfers	3.9	4.5	7.0
Works	-	37.9	464.0
Machinery and Equipment	<u>378.9</u>	<u>871.6</u>	<u>1,074.0</u>
TOTAL	545.7	1,101.8	1,695.8

As shown in the following table the GDAL employs 282 persons of which 50% are professionals with university degrees, 8% are listed as technicians and the remaining 42% constitute administrative personnel.

Human Resources in the Lima Office of the GDAL

	<u>Professionals</u>	<u>Technicians</u>	<u>Administrative and Services</u>
Programming	32	10	55
Agriculture	37	3	16
Breeding	18	-	16
Entrepreneurial Development	29	2	14
Supervision and Control	<u>25</u>	<u>8</u>	<u>17</u>
	141	23	118

The following tables lists the human resources of the GDAL at the regional level.

TABLE 2

Human Resources of the General Directorate of Agriculture and Livestock at the Regional Level

<u>GDAL Regional Offices</u>	<u>Professionals</u>		<u>Technicians in Districts</u>	<u>Administrative</u>	<u>Total</u>
	<u>Regional Office</u>	<u>Agricultural Districts</u>			
I* Piura	20	56	88	17	181
II* Chiclayo	25	68	127	68	288
III* Trujillo	14	39	60	9	122
IV* Huaraz	11	76	59	7	153
V* Lima	38	104	228	107	477
VI Arequipa	15	40	107	32	194
VII Huanuco	9	27	63	13	112
VIII* Huancayo	21	59	88	38	206
IX* Cusco	17	46	127	44	234
X* Puno	18	51	76	25	170
KI* Moyobamba	15	43	115	12	185
KII Iquitos	15	43	87	8	153
KIII Tacna	6	15	37	18	76
	<u>224</u>	<u>667</u>	<u>1,262</u>	<u>398</u>	<u>2,551</u>

Offices to be included in the Project.

c. National Agrarian University

Background

By virtue of the University Law of 1960, this educational center founded in 1902 was raised to the category of University. NAU maintains a leading role in the field of agricultural education and research throughout Latin America. At the present time NAU has 386 professors of which 73% are listed as permanent staff while 27% work under contract. A high percentage of the professors presently teaching at the NAU have master and PhD degrees from foreign universities. In addition it has 17 administrative positions.

NAU offers eight Academic Programs: (1) Agronomy, (2) Sciences, (3) Forestry Sciences, (4) Economics and Planning, (5) Food Industries, (6) Agricultural Engineering, (7) Fisheries, and (8) Animal Science. NAU has a Graduate Academic Program and confers the Academic Title of Master in the following fields: Agricultural Economics, Entomology, Phytopathology, Water and Soil Engineering, Agricultural Engineering, Nutrition, Animal Production, etc. Also NAU maintains two research programs, one in the field of agriculture

and the other in the field of livestock. For the Academic Departments within NAU see Annex III, Exhibit 5. For 1979 UNA received from the Public Treasury the amount of \$2.9 million to implement its academic activities.

3. Project Implementation and Coordination

The difficult economic and organizational conditions currently prevailing suggest an overall implementation strategy that must make maximum use of scarce technical and administrative talents. The scarce technical talent must be brought to bear on programming limited human capacities in the redevelopment of essential institutions. Similarly, the scarce administrative talents suggest a division of labor to implement the proposed coordinated system.

With any single REE institution, administrative capacities to implement the total system are not in place. The expectation is that given a coordinated institutional system and subsequent delegation of implementive and administrative actions for each cooperating institution, the total system can move forward. For example, given specification of the role to be played by extension, the existing administrative structure within extension should be able to administer that component. Similarly, there would be specifications for the educational institutions and for the research institutions.

With regard to the potential institutional structure required under the Project, particularly as related to administrative capacities, the following conditions and prospects prevail:

- There is acceptance of the view that a coordinated system concept is required;^{1/}
- There is acceptance of the view that individual institutional identity, within a coordinated system, is preferable to a grand restructuring;
- There is a recognition of the obstacles to a coordinated system, but also acceptance of the view that a redeveloped REE structure is a very top priority;

^{1/} The Minister of Agriculture has recently directed that a re-organization plan for a revamped REE system be drafted along the lines presented in this paper and based on the assessment incorporated in the Baseline Study.

- There is also acceptance of the fact that the coordinating responsibilities will require the careful selection of leaders from the involved institutions.

Thus, the acceptable view among the various entities is to utilize scarce leadership capability to carefully screen the technical leadership in relation to the system's components to be implemented and to attempt to create an environment that rewards productive activity, as well as to create real career opportunities for old and new agricultural professionals.

To accomplish this task requires consideration of the following options to address the administrative aspects of the planned system:

- To create incentives to attract top professionals to the task of programming and implementing the system;
- To assist in training additional personnel in administrative issues, either by forms of apprenticeship or by carefully structuring administrative training programs;
- To structure a component of the foreign technical assistance package with a focus on administrative issues;
- To take advantage of non-U.S. technical assistance options that may bring experienced administrative ideas into the implementation activities of the REE systems.

Based on these considerations several organizational alternatives were considered for the implementation of the Project. They include: 1) consolidation of the responsibilities of the different functions of the various REE institutions into one decentralized agency under the MAF; 2) establishment of a formal executive board responsible for all REE activities across agency lines and composed of the heads of all of the relevant agencies, universities and MAF directorates involved in REE activities. This board would be responsible to the Minister of Agriculture and Food, or alternatively to the Board of Directors of INIA; and, 3) coordination of the individual responsibilities of each of the currently active REE institutions through a Project Implementation and Financial Division within INIA, responsible to INIA's Board of Directors and Executive Director.

Alternatives "1" and "2" were rejected given the bureaucratic and legal constraint entailed in their implementation. Briefly, consolidation of all activities within one single agency, while organizationally appealing, would require the development and creation (either through a decree law or, after August a congressionally sanctioned law) of a new governmental entity. Mission experience in

Peru suggests that the issuance of limited scope decrees laws is often a difficult and time consuming task, and even longer delays might be anticipated in the case of the creation of a new agency. These alternatives also pose serious bureaucratic problems, since resistance from the involved agencies would be formidable in both cases. Lastly, the Mission and the implementing agencies were also guided by the experience of the I.D.B. regarding the implementation of the extension project sponsored by the Bank, which has been considerably slowed by the bureaucratic and institutional problems generated by the creation of just such a high level coordinating committee as proposed in the alternative "1". The Mission and the GOP, therefore, selected alternative "3", which it is believed would provide a strong technical orientation to the Project and effective implementational arrangements, as well as require a minimum number of organizational changes.

The scheme which has been developed avoids the concern raised above and has the endorsement of the Minister of MAF and the highest levels of INIA and NAU. It provides for a National REE management division for the REE system to be located within INIA in an implementation division created for this purpose under the existing authority of INIA's Board and Executive Director (see Annex II, Exhibit 2 for a schematic of the organizational structure). A project director will be hired on a full time basis for the implementation of the Project and will be responsible to INIA's Executive Director and Board. INIA in turn will provide the necessary logistic and administrative support, as well as the disbursing and fiscal authority, which it already possesses. The latter obviates the need for additional legal authority for the financial aspects of the Project.

The Project Director will be supported in his activities by an administrative and financial unit which will develop annual financial plans and reports, disburse Project funds to the various implementing agencies, review account statements and provide any other necessary support. A Title XII long term technical assistance committee will be formed to assist the Project Director in developing the Project's goals and objectives, in reviewing the effectiveness and scope of these activities and providing expert technical advice to the Project as required. The short- and long-term technical assistance to be provided to the Project, which is described below, will be coordinated at this level.

Four implementation units will report directly to the Project Director. These are extension, university education, continuing education and research. Four high level technicians assigned on a full-time basis to the Project from the various agencies involved in each of these activities will head-up these units. They will be responsible for developing, in conjunction with the appropriate agencies, the Project funded activities for each of these areas and monitoring the implementation and evaluation of these activities by

the various agencies, at the national, regional and local levels. These units will also coordinate the utilization of short-term technical assistance within each area of speciality.

INIA will develop formal working agreements with each of the agencies involved in the Project, which provide for execution of the Project components. These agreements will specify the planning, financial, supervision and evaluation responsibilities of INIA and the design and execution responsibilities of the involved agency. They will also specify the personnel of each agency who will be permanently detailed to the Project at each level of execution. This procedure is a common one in Peru, and INIA currently has several such arrangements with entities who will participate in the Project.

A.I.D. Grant assistance will be provided to finance the following:

a. One long term U.S. Project advisor for four years to assist at the highest levels in the planning and implementation of the system, who will also participate as an ex officio member of the Title XII Advisory Committee. This person will also advise the Project Director with emphasis on system content, coordination of system components, coordination of external assistance within the system, material acquisitions, external training components, logistics and coordination of foreign personnel. As possible this individual may also participate in research as well as in the graduate school training component.

b. Two long-term U.S., or Peruvian Project assistants for five years to assist in Project implementation. These assistants will be assigned as members of the National REE Management Division and will be assigned as counterpart to the assistant directors of extension, education, continuing education or research to facilitate system programming and implementation. They will also have a major responsibility for system evaluation involving the elimination of constraints on human, material and informational flows. As possible, these individuals may function as research or extension professionals, as well as participants in selected training components.

B. Financial Analysis

1. Financial Plan

The Loan will finance a five year Project with a twenty-five year A.I.D. Loan of \$9.0 million and A.I.D. Grant of \$2.0 million as proposed under the Project. The A.I.D. Loan will have a ten year grace period, with interest at 2% during the grace period and 3% thereafter. The Borrower will be the GOP acting through the Ministry of Economy and Finance. The \$9.0 million A.I.D. loan will be utilized to finance the various elements of the REE system. The A.I.D. grant will finance approximately 135 person months of technical assistance to the National REE Management Division, the extension program, the research program and the education program. The A.I.D. grant will also finance 12 years of U.S. long term training.

The GOP counterpart contribution to the Project will total \$4.0 million all of which will be invested into the REE system being created by this Project. GOP counterpart disbursements to finance Project costs will gradually increase over the five year life-of project, covering 13% for the first year to 45% for the fifth Project year. The Project's recurrent (salary incentives, budget support, and vehicle maintenance) costs will receive 5% GOP financing in the first year and will increase to 90% by the end-of-project. This phasing in of recurrent and Project costs will assure that the GOP will have made the necessary budget allocations by the end of the project to continue providing for recurrent costs and expand the REE system. The Project will have a total estimated cost of \$15 million with GOP counterpart contribution (\$4.0 million) representing more than 25% of the Project's total cost, thus satisfying Section 110 (a) of the FAA.

The Mission included an inflation factor of 15%. This level is justified on the basis of a 60% rate of inflation in Peru during CY 1979 with a corresponding devaluation of only 20% during that period. Inflation in the U.S. appears to be headed for a double-digit inflation rate currently projected in excess of 15% in 1980.

The contingency factor used by the Mission was 8% and is justified on the basis that the project is attempting to establish a new research and extension system. Although most costs have been identified, it is believed that, because of its innovative approach, some unidentified cost factors will arise during implementation which utilize contingency funds.

TABLE 3
 Summary Financial Plan
 Research, Extension and Education Project

Investment Categories	A.	I.	D.	GOP	Grand Total
	Loan	Grant	Total		
(U. S. \$ 000)					
<u>I. Extension Program</u>					
A. National Production Programs	3161	-	3161	835	3996
B. Regional Service Labs.	740	-	740	520	1260
	3901	-	3901	1355	5256
<u>II. Research Program</u>					
A. Regional Research Centers	1157	-	1157	770	1927
B. National Research Support	1234	-	1234	370	1604
	2391	-	2391	1140	3531
III. <u>Education Program</u>	405	180	585	242	827
IV. <u>National REE Management Unit</u>	156	-	156	110	266
V. <u>Technical Assistance</u>	-	1700	1700	190	1890
Total (I) to (V)	6653	2080	8733	3037	11770
Plus: Inflation & Contingencies	2147	120	2267	963	3230
	9000	2000	11000	4000	15000
			75%	25%	100%

TABLE 4
Research Extension and Education Project
Source and Application of Funds
(U.S. \$ 000)

Investment Categories	Total	A. I. D.		GDP Total	Grand Total
		Loan	Grant		
<u>Extension Program</u>					
<u>A. National Production Programs</u>					
- Vehicles	448	448	-	-	448
- Equipment	175	175	-	150	325
- Facility Improvement	100	100	-	10	110
- Library Support	100	100	-	10	110
- Publications	75	75	-	15	90
- Training	1200	1200	-	120	1320
- Extension Implementation Support	2501 ^{1/}	250	-	50	300
- Research Implementation Support	188	188	-	20	208
- Vehicle Operation & Maint.	250	250	-	60	310
- Salary Incentives	375	375	-	100	475
- Salaries & Facilities	-	-	-	300	300
Sub-Total:	3161	3161	-	835	3996
<u>B. Regional Services Labs.</u>					
- Vehicles	60	60	-	-	60
- Equipment	120	120	-	90	210
- Facilities	60	60	-	10	70
- Training	90	90	-	100	190
- Implementation Support	300	300	-	50	350
- Vehicle Operation & Maint.	50	50	-	20	70
- Salary Incentives	60	60	-	10	70
- Salaries & Facilities	-	-	-	240	240
Sub-Total:	740	740	-	520	1260
Total Extension Program	3901	3901	-	1355	5256
<u>I. Research Program</u>					
<u>A. Regional Research Centers</u>					
- Vehicles	180	180	-	-	180
- Field Machinery	120	120	-	255	375
- Lab. Equipment	120	120	-	20	140
- Facility Improvement	60	60	-	10	70
- Research Support	270	270	-	30	300
- Training	252	252	-	150	402
- Library Support	45	45	-	30	75
- Salary Incentives	110	110	-	25	135
- Salaries & Facilities	-	-	-	250	250
Sub-Total:	1157	1157	-	770	1927
<u>B. National Research Support</u>					
- Equipment	84	84	-	100	184
- Facility Improvement	20	20	-	10	30
- Research Facilities	210	210	-	40	250
- Research Support	400	400	-	80	480
- Library Support	80	80	-	10	90
- Foreign Training	240	240	-	30	270
- Salary Incentives	200	200	-	50	250
- Salaries & Facilities	-	-	-	50	50
Sub-Total	1234	1034	-	370	1604
Total Research Program	2391	2391	-	1140	3531
<u>II. Education Program</u>					
- Facility Improvement	20	20	-	10	30
- Training Equipment	40	40	-	10	50
- Library Support	95	95	-	12	107
- Training Support	90	90	-	60	150
- Salary Incentives	100	100	-	20	120
- Foreign Training	240	60	180	30	270
- Salaries & Facilities	-	-	-	100	100
Total Education Program	585	405	180	242	827
<u>III. National REC Management Unit</u>					
- Administration Costs	50	50	-	10	60
- Travel Expenses	25	25	-	20	45
- Salary Incentives	50	50	-	10	60
- Technical Committee	30	30	-	20	50
- Salaries & Facilities	-	-	-	50	50
Total Nat.Coordination Unit	156	156	-	110	266
<u>IV. Technical Assistance</u>					
- Long-term	1100	-	1100	150	1250
- Short-term	600	-	600	40	640
Total Technical Assistance	1700	-	1700	190	1890
Total I + II + III + IV + V	8733	6853	1880	3037	11770
Plus: Inflation & Contingencies	2267	2147	120	963	3230
	11000	9000	2000	4000	15000

^{1/} Extension Implementation Support line item includes \$100,000 to finance mass media campaign. Short-term T.A. and training is included to support this activity.

TABLE 5
Research, Extension & Education Project
Requirements of Foreign Exchange & Local Currency
(In Thousands of U.S. Dollars)

Investment Category	A.	I.	D.	GOP	Grand Total
	Total FX + LC	FX	LC	LC	
I. Extension Program					
A. National Production Programs					
- Vehicles	448	448	-	-	448
- Equipment	175	175	-	150	325
- Facility Improvement	100	-	100	10	110
- Library Support	100	80	20	10	110
- Publicitions	75	50	25	15	90
- Training	1200	-	1200	120	1320
- Extension Implementation Support	250	-	250	50	300
- Research Implementation Support	188	-	188	20	208
- Vehicle Operation & Maint.	250	-	250	60	310
- Salary Incentives	375	-	375	100	475
- Salaries & Facilities	-	-	-	300	300
Sub-total:	3161	753	2408	835	3996
B. Regional Service Labs.					
- Vehicles	60	60	-	-	60
- Equipment	120	120	-	90	210
- Facilities	60	-	60	10	70
- Training	70	30	60	100	190
- Implementation Support	300	-	300	50	350
- Vehicle Operation & Maint.	50	-	50	20	70
- Salary Incentives	60	-	60	10	70
- Salaries & Facilities	-	-	-	240	240
Sub-total:	740	210	530	520	1260
Total Extension Program	3901	963	2938	1355	5256
II. Research Program					
A. Regional Research Centers					
- Vehicles	180	180	-	-	180
- Field Machinery	120	120	-	255	375
- Lab. Equipment	120	100	20	20	140
- Facility Improvement	60	-	60	10	70
- Research Support	270	-	270	30	300
- Training	252	52	200	150	402
- Library Support	45	20	25	30	75
- Salary Incentives	110	-	110	25	135
- Salaries & Facilities	-	-	-	250	250
Sub-total:	1157	472	685	770	1927
B. National Research Support					
- Equipment	84	84	-	100	184
- Facility Improvement	20	-	20	10	30
- Research Facilities	210	-	210	40	250
- Research Support	400	-	400	80	480
- Library Support	80	20	60	10	90
- Foreign Training	240	240	-	30	270
- Salary Incentives	200	-	200	50	250
- Salaries & Facilities	-	-	-	50	50
Sub-total:	1234	344	890	370	1604
Total Research Program	2391	816	1575	1140	3531
III. Education Program					
- Facility Improvement	20	-	20	10	30
- Training Equipment	40	40	-	10	50
- Library Support	95	55	40	12	107
- Training Support	90	-	90	60	150
- Salary Incentives	100	-	100	20	120
- Foreign Training	240	240	-	30	270
- Salaries & Facilities	-	-	-	100	100
Sub-total:	585	335	250	242	827
IV. National REE Management Unit					
- Administration Costs	50	-	50	10	60
- Travel Expenses	26	-	26	20	46
- Salary Incentives	50	-	50	10	60
- Technical Committee	30	-	30	20	50
- Salaries & Facilities	-	-	-	50	50
Total Nat. Coordination Unit	156	-	156	110	266
V. Technical Assistance					
- Long-term	1100	1100	-	150	1250
- Short-term	600	600	-	40	640
Total Technical Assistance	1700	1700	-	190	1890
Total (I)+(II)+(III)+(IV)+(V)	8733	3814	4919	3037	11770
Plus: Inflation & Contingencies	2267	740	1527	963	3230
Total	11000	4554	6446	4000	15000

TABLE 6

**Research, Extension and Education Project
Project Disbursements by Year**

(In Thousands of U. S. Dollars)

<u>Investment Categories</u>	<u>Year I</u>	<u>Year II</u>	<u>Year III</u>	<u>Year IV</u>	<u>Year V</u>	<u>Grand Total</u>
I. <u>Extension Program</u>						
(A). National Production Programs						
A.I.D.	942	752	601	481	385	3161
GOP	101	127	159	200	248	835
(B). Regional Service Labs.						
A.I.D.	220	176	141	113	90	740
GOP	63	79	99	124	155	520
II. <u>Research Program</u>						
(A). Regional Research Centers						
A.I.D.	345	275	220	176	141	1157
GOP	93	117	147	183	230	770
(B). National Research Support						
A.I.D.	367	294	235	188	150	1234
GOP	45	56	70	88	111	370
III. <u>Education Program</u>						
A.I.D.	175	139	111	89	71	585
GOP	29	37	46	56	74	242
IV. <u>National REE Management Unit</u>						
A.I.D.	47	37	29	24	19	156
GOP	13	17	21	26	33	110
V. <u>Technical Assistance</u>						
A.I.D.	400	400	350	350	200	1700
GOP	45	45	40	40	20	190
Sub-total A.I.D.	2496	2073	1687	1421	1056	8733
Sub-total GOP	380	478	582	717	871	3037
Total A.I.D. + GOP	2885	2551	2269	2138	1927	11770
Plus: Inflation & Contingencies	550	580	615	710	775	3230
Grand Total:	3435	3131	2884	2848	2702	15000

TABLE 7

Research, Extension and Education Project
Technical Assistance Component

<u>I.</u>	<u>Long Term</u>	<u>Time Required</u>
	- One U.S. Project Advisor	48 m/months
	- Two U.S./Third Country/Peruvian Project Assistants	<u>120</u> m/months
		168 m/months
<u>II.</u>	<u>Short Term</u>	
	A. Extension	30 m/months
	B. Research	46 m/months
	C. Education	<u>18</u> m/months
		94 m/months
	Total (I) + (II)	262 m/months

(At a cost of \$7,000 per person month for short term
TDY and \$9,000 per person month for long term TDY)

TABLE 8

TRAINING

<u>A.</u>	<u>National Production Programs</u>	<u>Time input in Man/Months</u>
	<u>Short-term/Non-formal/Peru</u>	
	- SNPP Teams	270
	- Team leaders, researchers and extensionists	165
	- Sectoristas	125
	<u>Long-term/Formal/Peru</u>	
	- Extensionists and Researchers	240
<u>B.</u>	<u>Regional Research Labs</u>	
	<u>Short-term/Non-formal/Peru</u>	
	- Full Teams (Lab technicians and agronomists)	180
<u>C.</u>	<u>Research Centers</u>	
	<u>Short-term/Non-formal/Peru</u>	
	- Researchers	60
	<u>Long-term/Formal/Peru</u>	
	- Researchers	120
<u>D.</u>	<u>National Research Support Unit</u>	
	<u>Long-term/Formal/Off-Shore</u>	
	- NAU and INIA Researchers	180
<u>E.</u>	<u>Education Program</u>	
	<u>Short-term/Non-formal/Peru</u>	
	- Researchers	240
	<u>Long-term/Formal/Peru</u>	
	- Researchers	240
	<u>Long-term/Formal/Off-Shore</u>	
	- NAU Researchers	180
	Total	2,000 m/months

2. Recurrent Costs

During the past three years the GOP fiscal austerity program has severely reduced operational budgets for its public sector programs. The agricultural sector, like nearly all the others, was reduced to minimum often leaving no funds for vehicle or equipment maintenance, or replacement of worn out or expendable goods. These budgets allowed payment of salaries and utilities with little left even for the maintenance of existing programs. Peru is now slowly entering into an economic recovery phase. The national budgets are just now showing signs of a relaxation from the harsh fiscal austerity of the last few years. Increased allocations, in real terms, are expected to occur during the next few years in the public sector budgets.

The REE Project has been designed so that A.I.D. financing covers most project activities during the first project year and declines to 55% by year five. The GOP input in the Project therefore increases by nearly 300% from year one to year five while during the same period the AID contribution to the Project decline by 50%. This Project design will assure a rapid start up of the REE system and also assure that by the end of the Project the GOP has fully incorporated the Projects recurrent costs into the national budget.

Table 9 shows the operational recurrent costs of the MAF, INIA, CENCIRA, and NAU throughout the life-of-project. For purposes of this analysis the budgets of each institution have been increased by 10% a year (or at current dollar inflation rates no real term increase is assumed), therefore, the projections probably represent a worst case view. GOP investment in the Project in percentage terms of recurrent budget costs in the first year is 1.21% of the total recurrent budgets. This figure doubles to approximately 2.51% by the end-of-project. By 1985 following the Project's completion, when all recurrent cost of the Project must be financed by the GOP, the percentage of that years recurrent budgets rises to 4%. The Project committee is confident that based on Peru's improving economic conditions this 4% recurrent cost for continued REE system maintenance will be within the financial capability of the GOP.

C. Economic Analysis

1. Economic Overview of Agricultural Sector

As was pointed out earlier (See Section II A.1, Country Setting), the availability of land suitable for agriculture in Peru is extremely limited. Because of this over-riding limiting factor, it is an economic imperative for Peru to adopt a strategy which has a dual thrust: (1) increase its arable land base, through

TABLE 9

OPERATIONAL RECURRENT COSTS
(Millions of U.S.Dollars)

	1979 ^{1/} Base Year	(I)	(II)	(III)	(IV)	(V)	1985
		1980 ^{2/}	1981	1982	1983	1984	
<u>Without Project</u>							
Ministry of Agriculture and Food	22.8	25.1	27.6	30.3	33.0	36.3	39.9
INIA	2.9	3.2	3.5	3.9	4.3	4.7	5.2
CENCIRA	0.6	0.7	0.8	0.9	1.0	1.1	1.2
UNA	3.5	3.9	4.3	4.7	5.2	5.7	6.3
TOTAL	29.8	32.9	36.2	39.8	43.5	47.8	52.6
<u>With Project</u>							
GOP Counterpart		0.4	0.5	0.8	0.9	1.2	1.9
GOP Counterpart as a % of total Costs		1.21%	1.38%	2.01%	2.06%	2.51%	4%

1/ Actual

2/ Assumes 10% increase per year

programs of land reclamation, irrigation and improved accessibility to high quality land in currently isolated regions; and (2) improve upon its productivity so as to maximize economic benefits from its scarce land resources.

Over the past decade, the GOP has concentrated the bulk of its agriculture investment resources on the former; through international donor financed, large-scale, coastal irrigation projects and the construction of new penetration and feeder roads, the GOP has achieved an increase in its arable land base of about 0.5% a year, on the average; most of this is in coastal areas. While some of the GOP's more ambitious irrigation projects appear to be an inefficient economic use of capital, the government's recognition of the need for an overall land expansion policy is nonetheless a critical step forward, and recent GOP efforts vis a vis ceja de selva expansion represent a very positive effort in terms of eventually meeting GOP food production targets.

What is needed, however, to complement these activities is a systematized approach to increasing productivity, both on lands already under cultivation as well as those which will come into production as a result of agricultural infrastructure investments. If current nationwide yield averages on basic food crops were to prevail in the case of new agricultural lands coming on-stream as a result of several of the new irrigation projects (e.g. Majes, Olmos, Chira-Piura), there is no doubt that the eventual economic rates of return to these projects will be negative and their repayment, even at subsidized interest rates, would become a major economic burden on Peru.

Statistics on the past decade performance of the agricultural sector are extremely discouraging, and reflect the neglect of the sector:

- At present an estimated 18% of GDP is generated from agriculture, a sector which employs about 35% of the economically active population.

- Productivity per capita in the agricultural sector has been dropping steadily since 1968; using 1965 productivity statistics as an index (100) per capita productivity is now about 85.

- High income elasticities for food (estimated at about 1.5) have been a major issue in Peru's chronic inflation.

- Decreased export earnings from agriculture (cotton, sugar, etc.) have been accompanied by massive increases in imported foodstuffs, causing extreme pressure on the GOP's balance of payments during most part of the decade.

Within the "Research, Extension and Education Sub-sector" of the overall agricultural picture in Peru, one can begin to understand some of the reasons for the falling sector productivity. Sub-sector budgets have been steadily declining, in real terms, since 1968; investment capital to refurbish extension stations, replace outdated or wornout equipment, or provide needed equipment to research laboratories or field stations has been diverted to other sub-sectors. As a result, latest budget figures show that 95% of sub-sector funds currently go to personnel payments, with only an estimated 5% for support costs. Trained extension agents find little to hold them in the field, so after spending minimal amounts of time in agricultural-producing zones, they return to coastal urban areas for desk jobs, which are frequently totally unrelated to their professional training. Laboratory equipment allows for only the most rudimentary experimental work, so trained research technicians regularly leave the university system and take jobs abroad or in private industry. One member of the highly-successful North Carolina State Mission program, working in Peru in the 1960's, recently estimated that over 100 Peruvians who were trained under the North Carolina program are now working abroad. By not implementing an effective operative system for REE in Peru, the GOP stands to lose on two economic fronts: (1) agricultural productivity remains stagnant in some cases, declining in others; (2) human resource capital, trained at expense to the GOP, is being wasted in terms of the original investment.

The immediate target population to be served directly by the present Project consists of an estimated 125,000 small farm families, either farming small individual plots or members of associative enterprises: GNP per capita for these farmers is estimated at less than \$150 per year; they possess minimal managerial and technical capabilities to effectively make rational economic choices about farm management, crop selection and marketing; and they, have sporadic and frequently untimely access to institutionalized agricultural credit, and literally no access to government sponsored technical assistance via an outreach/extension system which can respond to their economic cycle of planting, crop management and harvest. The result is economic stagnation for the majority of small farmers. The financial rewards from small-scale farming are increasingly unattractive to younger, more educated, family members. Theorists can argue interminably whether it is the "pull" of the urban areas or the "push" from the rural areas which has caused the record rural-urban (and sierra-coast) migration during the last ten years. It cannot be argued, however, that rural, and especially sierra, on-farm job opportunities are simply not available for up to 50% of farm family offspring who are estimated to have migrated to the urban areas. An effective REE system will not reverse the flow of outmigration from rural areas, but any system which works to increase per capita output and crop yields will help to control it within the absorptive limits of the urban areas.

2. Economic Rationale for the REE System

To determine whether the REE system is a rational economic alternative for the GOP, it is necessary to consider two distinct questions: (a) how can the agricultural sector be altered to increase its contribution to GDP, and (b) considering the fact that the GOP has a number of alternatives and scarce financial resources, why should the implementation of an REE system be a priority?

How can the sector be altered to increase contribution to GDP?

If we accept the premise posited earlier that simply opening up new lands for agricultural production, without providing complementary services to raise productivity, is not an economically viable consideration, then given the costs associated with the former in a country such as Peru, there are essentially two basic ways that Peru can increase the agricultural sector's contribution to GDP. First, it could adopt a series of policies designed to increase both output and capital accumulation at the same time. This could be implemented through such decisions as: providing incentives to mechanization, providing incentives for cultivation of high cash export crops, stimulation of policies which favor asset ownership, and adopting factor/product price policies which favor quick -- and profitable -- coastal valley production, with less attention given to sierra and high jungle agricultural opportunities. The results of such a series of policies are obvious. It would act as a catalyst to a return to the inequitable systems of the past, speed up the already alarming pattern of rural-urban migration and, while it would provide a positive push to the agricultural export sector, it would do so at the expense of increasing food production, on-farm employment and income distribution.

A second alternative is to seek a series of policies designed to increase productivity while at least maintaining -- and hopefully increasing -- equity distribution in agricultural producing areas. This involves the creation of a sustained capacity for technological innovation, adaption and delivery to existing and to-be-created small farmer units and associative enterprises; the end product of such a system would be to increase output for each unit of input.

The first alternative is an attractive one from a short term GOP budget perspective. First of all, it is less costly. The government need merely provide certain incentives, such as tax advantages, credit subsidies and changes in pricing policies; little in actual cash outlay would be required. Second, a reconstituted dynamic export sector would provide a quick payoff in

terms of export earnings. Third, the government could minimize its dealings with the myriad organizations created as a result of the Agrarian Reform, the majority of which have serious financial, as well as social and political problems.

The economic implications of the second alternative are further down the time horizon. The costs are substantially greater, since it would involve creation of a system to adapt and deliver a package of technology to small farmers located over widely dispersed geographic areas; and the full economic benefits would not probably be realized for at least eight to ten years. When they are finally realized, however, they will be substantial, not only in the strict economic sense, but in terms of their equity considerations. They include: increased employment opportunities, increased food production, increased agro-industry possibilities, a lowering of outmigration trends with their concomitant social problems in receptor urban areas and a more equitable distribution of wealth in agricultural producing areas.

Why the REE approach?

If growth with equity is to be a tenet of the new Government's policies with regard to its options in the agricultural sector, it must place increased emphasis on the second alternative outlined above, e.g. increasing output through the creation of a sustained capacity for technological innovation, adaption and delivery of services to the small farmer sector. This can only function with the revitalization of the GOP's efforts in the areas of research, extension and education. Through regionally focussed crop-specific programs of research, new cultivation techniques can be developed which allow small farmers options in their productive pattern; at present, operating under conditions of uncertainty and low technological know-how, farmers' options are essentially limited to following traditional practices, which have resulted in lowered productivity over the past decade. Through an active extension system, the results of applied research can be tested and disseminated throughout the targeted regions, adapting such research in accordance with local conditions. Education is the fundamental keystone upon which all innovative research and extension must be built, since it provides the theoretical and practical framework in which the institutionalized functions of creation, adaption and delivery of services can be realized.

3. Macroeconomic Impact of REE

The following favorable macroeconomic impacts are expected as a result of the institutionalization of the REE System:

- Increased food production, with expected drop in real prices to the consumer, will have a favorable impact both on nutrition levels as well as the rate of inflation;

- The output of foodstuffs currently imported will be increased, thus impacting favorably on the balance of payments, such foodstuffs include corn, beans, edible oils, livestock, etc.;

- Once food production increases, there exist possibilities for Peru to begin once again to export food products such as rice, potatoes and citrus fruits;

- Increased employment in rural areas will have a favorable impact of reducing outmigration at urban areas;

- Favorable impact on redistribution of income will help overcome the existence of absolute poverty, which is prevalent in many of Peru's rural areas.

4. Cost Effectiveness of REE

There is increasing evidence in the literature of agricultural economics that there is a consistently high internal rate of return associated with projects of research, education and extension. Furthermore, current literature in the field indicates that rates of return are generally higher in the LDC's than in the developed world, and in addition the higher rates of return are closely associated with an organizational structure which is based on a decentralized approach to the REE system. A recent study "Economic Benefits from Research: An Example from Agriculture"^{1/} looked at the IRR's associated with 32 different agricultural research and extension projects throughout the world conducted between 1938 and 1975. The study estimated the return from investment in agricultural research, obtained by using index numbers and regression analysis, and found that:

Almost all investigators reported high returns on investment, well above the 10 to 15 percent realized on typical investments. The pattern of high returns extends across different commodities and countries, confirming both their generality and the strength of the methods used in their estimation.

In addition to benefits accruing from research and extension activities, higher rates of return can be expected as a result of human capital formation activities of the Project.

^{1/} Evenson, Waggoner and Ruttan, "Economic Benefits from Research: An Example from Agriculture", Science, Vol 205, 14 Sept. 1979, pp. 1101-1107.

While the rates of return on the 32 projects ranged from 11-12% (Colombian Wheat, 1953-73) to 95-110% (Canadian rapeseed, 1960-75) the aggregate average IRR for research conducted in the United States was approximately 30%; the figure for the less developed world was well over 50%. As a result, the study concludes:

"Agricultural research is like an undervalued stock whose price-earnings ratio is low. In nearly every case ... a nation could have expended its investment in agricultural research and earned a rate of return far higher than from almost any other investment."

D. Social Analysis

1. Social Structure Overview of Target Population

The associative enterprise members and small-scale individual farmers who comprise the primary target population of the proposed Project are by no means a homogenous social grouping. Their heterogeneity is evidenced by examining two key factors:

(a) Ethnic composition/language

At the risk of over-generalization, we can generally divide the target farmer population into two distinct ethnic groupings, Indian (principally Quechua-speakers) and Mestizo (principally Spanish-speakers). The Indian/Quechua population is primarily concentrated in the Southern Sierra, or mancha india area of Peru, with lesser concentrations in parts of the Central Sierra. This population is considered to be the poorest in Peru; illiteracy rates frequently are above 70%; they have virtually no access to on-going extension or education programs of the GOP because of language isolation; per capita income averages an estimated \$75 per year, and many families virtually have no cash income, relying on self-sustenance farming and barter. The Quechua-speaking population is, on the other hand, a much more cohesive unit than their mestizo counterparts. The majority of Southern Sierra Indians are grouped into indigenous communities, many of which have been in continuous existence for well over 200 years. There is a strong family and community social structure. This provides a sense of stability among community members, but also frequently acts as a hindrance to adopting new social and economic practices, since the older members of the community -- usually those with the least amount of education and exposure to the modern world -- are those which make community decisions, including those related to farm practices.

The second broad grouping, the mestizo/Spanish ethnic population, are the more populous in the Central and Northern Sierra and the high jungle. Most are small freeholders or members

of associative enterprises created as a result of the Agrarian Reform process. While many have some roots back in indigenous communities, the majority have no real tribal or communal identification; this lack of identification has created some very real problems in the entire Agrarian Reform, since most attempts to create an atmosphere of "worker solidarity" among its beneficiaries have met with little success, and farm workers will tend to perceive their own best welfare in terms of individual rewards instead of collective benefits. The mestizo/Spanish population does, however, possess many advantages which the Indian population groupings do not. First, they have, by reason of language and higher degrees of literacy, far greater access to dissemination efforts of the MAF -- through radio, extension visits, and promotional literature distributed either by the MAF or commercial distributors of agriculture inputs, they have a much closer contact with the modern sector. Second, the very lack of community cohesion acts to allow for a far greater degree of individual innovation/experimentation, since farm cultural practices are not carried out on a communal basis. If a small farmer wishes to experiment with new seed varieties, agro-input mixes, or even new cropping patterns, there is little if any social pressure put on him to conform to general practices in the area.

(b) Geographic Location

The target area to be served by the Project comprises both sierra and high jungle. Although there are extreme differences within each of these general geographic categorizations, (e.g. the high sierra of Puno and Cuzco bears only superficial resemblance to the lower sierra areas of Cajamarca and La Libertad, which have generally more fertile soils, less communication and transport problems and better access to coastal markets), we can nonetheless make some generalizations regarding the major socio-economic features of each.

The sierra is characterized by both climatic and geographic extremes, relatively small extensions of contiguous land, and while transport and communications are comparatively good in the major interconnecting valleys, access to highland areas is extremely difficult, often requiring several hours -- or in extremely remote areas, several days -- on horseback or foot to reach producer areas. In recent decades, the sierra has seen a rapid growth in the phenomenon of market towns, which serve as general service centers, for the outlying agricultural hinterlands. Small entrepreneurs have located in these market/towns, providing such services as transportation, provision of agricultural inputs, and serving as marketing middlemen. A system of informal credit has been fostered by these entrepreneurs, who offer pre-harvest credits to small farmers and associative enterprises in return for marketing contracts. While it is clear that

the middlemen frequently take a disproportionately large share of profits, they do perform necessary services which the GOP has neither the outreach capacity nor the financial means to perform. The average sierra farmer, then, has fairly good, if expensive, access to the commercial amenities of production.

The high jungle is characterized by vast areas of contiguous productive land, and the typical small individual farmer has, on the average, eight to ten times the land extension of his counterpart sierra farmer. This theoretically makes commercial farming more feasible, but high jungle production efforts are hampered by two major difficulties: lack of transportation and communication and a dearth of readily available commercial facilities to assist in pre-production, harvest and marketing activities. Farmers thus run much greater risks, especially in the production of perishable commodities which must reach consumer markets within a few days of harvest. While the high jungle farmers are among the most aggressive, in terms of moving into new production areas and experimentation, they are also the most isolated. MAF extension efforts in the high jungle are located only in major cities (e.g. Tarapoto) and transport difficulties preclude extensive outreach in the most potentially productive areas.

2. Project Beneficiaries

The major beneficiaries of the Project are those 275,000 sierra and high jungle farm families which will receive increased extension services from the GOP as a result of REE activities. In the central and northern sierra regions, farmers typically have much lower incomes, though it is difficult to obtain reliable income data. Sociologists and economists from the Catholic University have estimated, as a result of an on-going project in eight southern sierra villages, that as many as 35% of all families may receive no cash income at all, and that the average income is somewhere around half of that in the central and northern sierra areas. Income levels in the high jungle tend to be somewhat higher, averaging around \$250 per capita.

Nutritional status and housing conditions reflect the poverty of the target areas. Data reveals that throughout the sierra the average daily caloric intake is 1,780 compared to 2,264 among coastal residents and 2,600 which is considered to be normal adult requirements. The diet, moreover, is extremely limited, consisting basically of potatoes, corn, rice and other starches; protein deficiency in the sierra is the highest in the country. In the high jungle the diet is more balanced, and caloric intake is probably close to that on the coast. There are, however, severe deficiencies in vitamin A and D, and iodine and potassium.

Housing conditions are also below average in both sierra and high jungle regions. In the sierra, it is estimated that 90% of all dwellings, including rural and urban, are sub-standard; in rural areas, it is likely that this percentage is very close to 100%. A typical dwelling has adobe walls, a tin or straw roof, dirt floors and no windows, the door serving as the only source of light and ventilation. Overcrowded conditions cause major health-related problems, chief of which are tuberculosis and infectious diseases related to lack of sanitary facilities. High jungle housing conditions reflect the milder climatic conditions, and are combined indoor-out-door structures. As a result, there is far less crowding than in the sierra, but the lack of potable water and sanitary facilities combined with more exposure to disease-carrying insects has led to much the same health status as in the sierra.

Both sierra and high jungle are affected greatly by migration -- the former being areas of concentrated out-migration, principally to the already overcrowded coast, and the latter constituting an important receptor center for new migrants. The migration pattern, however, is not usually one of sierra to high jungle. Sierra migration typically follow the pattern of farm to sierra urban center, as a first step, and sierra urban to coastal urban as a final step. The low productivity of the typical sierra farm is such that increased population pressure cannot be absorbed in producing areas; younger family members thus migrate at first to the neighboring provincial capital for educational purposes or to find permanent work. When schooling is finished, or the anticipated work opportunities do not materialize, the coast -- the Lima metropolitan area in particular -- has become a magnet, which has produced alarmingly high growth rates in the capital.

Migrants to the high jungle are, for the most part either sierra entrepreneurs coming from 'modern' sierra growth areas such as Arequipa or from the coast. The San Martin-Amazonas area of the high jungle for example, is largely populated with migrants coming from coastal departments of La Libertad and Lambayeque.

3. Constraints to Project Success

The average Peruvian small farmer, whether located on the coast, sierra or high jungle, is typified by a very high degree of risk aversion. Because typical income levels are low, almost at the subsistence level, farmers cannot assume the same risks as small commercial or industrial entrepreneurs who have at least modest cash reserves in case of failure. For the vast majority of farmers, failure means bankruptcy and loss of land in the best of cases and literal starvation in the worst. Changing sierra and high jungle

productive patterns, to increase productivity and income, implies subjecting farmers to new risks. Thus Project success will involve: (a) recognizing that risk aversion is an important sociological reality among the target sector; and (b) designing mechanisms within the Project to insure that the farmers' perceived risk is minimized while at the same time inducing them to introduce new on-farm practices which will result in the intended benefits.

The Project contemplates a number of methods to overcome this potential constraint. First, marginal producers will be encouraged to exercise broad cropping options; movement out of subsistence crops into higher income cash crops will occur gradually, thus allowing farmers to witness experimentation results without jeopardizing family food consumption. As results are witnessed by the farmers, both on their own land and that of neighbors, perceived risk will be minimized and further crop substitutions and production practices will be encouraged.

Second, the Project will finance a rural sociologist to work with the NPPs system, who will work with farmer organizations to determine what cultural practices can be readily adapted to immediate use and what practices need to be treated more extensively via the extension outreach personnel. In addition, the Project will employ a significant number of bilingual sectoristas, who will be able to work with non-Spanish speaking farmers in their own tongue.

Finally, the Project administration will coordinate extension activities with training activities carried out by ACOMUC, a PVO agency charged with support to campesino women's activities. ACOMUC is currently receiving financing under a Mission OFG, and has carried out extensive training efforts with campesino women in the central sierra. Since rural women frequently have an important voice in farm management, their support will be critical in overcoming risk aversion tendencies, especially in the sierra.

4. Role of Women

Women are highly active participants in the Peruvian agricultural sector. Among the many roles which women play, perhaps the most important is that of general manager of the basic economic unit, the household. In the role of manager, women have an important input in determining cropping patterns, as well as disposal of cash income. The Project will coordinate efforts of ACOMUC in areas where this organization is active (see above) and make an effort to include women in training courses and extension visits. In addition, special emphasis will be given to the use of radio as a promotional mechanism in reaching women. Radio messages will be timed to reach a maximum number of women through specially prepared messages at times of the day that the largest number of women can be expected to listen. Of the total 250,000 farm family beneficiaries, or 1.5 million people, we anticipate that approximately half of the Project beneficiaries will be women.

E. Technical Analysis

A thorough technical analysis was performed during the Project's intensive review using the extensive information presented in the Baseline Study, which was performed through a Title XII financed GOP-North Carolina State University contract. This document is included as Annex III Exhibit 1. The PP incorporates the technical recommendations supported by the Baseline Study, but this section does not attempt to repeat the analysis which supports these recommendations, rather it expands on technical topics which were of particular interest to the DAEC at the PID review. These included: extension outreach methodology, commodity vs. farm management approach, salary supplements and crop selection.

1. Extension Outreach Methodology

The most vital component of the REE System is an effective extension element. The extension component will impact on target group farmers of three distinct types: (a) those who are members of agrarian reform enterprises, (b) individual commercial farmers and (c) individual subsistence farmers, who have potential for producing marketable surpluses. Each client group will require different extension packages and continuous on-farm demonstrations. Further, each client group will require different communication modes. It will also be necessary to make modifications in extension packages within similar client groups located in geographically diverse regions of the country.

The various communication modes available to the NPPs include, inter alia;; (a) individual farmer visits by sectoristas, (b) field demonstrations, (c) field days, (d) producer meetings, (e) seminars and courses, (f) meetings with farm leaders, (g) printed materials, (h) radio and (i) audio-visual equipment (e.g. video taped extension programs which will be complete extension packages). The selection of which mode will be most appropriate will depend upon the client group and the topic of interest.

As the extension packages are developed by each NPP team, they must consider the application of the packages to a wide range of production situations. For example, the rice NPP must take into consideration that the extension package will be applied to the irrigated rice production on the coast, as well as to upland rice production of the high and low jungle. Through the development of the various extension packages within a particular commodity, the number of farmers to be benefitted

To maximize the outreach of the REE system, promotional and informational messages will be developed and disseminated using available national and local communication media. Media campaign activities will be designed to complement the work of sectoristas by reinforcing and elaborating technical information related to particular agricultural packages, promoting visits by farmers to demonstration sites, publicizing the presence and activities of the sectoristas, etc. Specific informational and promotional needs will be determined by sectoristas, in consultation with the extension education specialist on the staff of each NPP. Message production will be accomplished utilizing the installed capacity of CENCIRA. During the first year of the project, a review of the production and distribution capability of CENCIRA will be accomplished, and project resources will be used to help make CENCIRA more directly responsive to the needs of the REE system field staff. During subsequent years, technical information developed by the project will be incorporated into the audio-visual system of CENCIRA for distribution and presentation to project target groups throughout the country.

Radio will be emphasized as a promotional and informational medium, and particular attention will be paid to developing messages that meet the needs of subgroups that have least access to regular, direct contact with the REE system. Subgroups such as farm women, non-Spanish-speaking farmers, illiterate farmers, and extremely remote and isolated communities will be identified by REE field staff for special radio programming.

The radio production unit as well as other mass media units within the MAF will be supported by short term technical assistance and training where necessary to strengthen their technology transfer capacity and institutionalize the use of media to support REE activities.

The impact of extension outreach activities of the Project are estimated as follows:

a) Each NPP will be provided vehicles and extension materials along with extension training to facilitate maximum farmer contact. Each sectorista of the NPPs will directly impact on 1,000 farm families (200/year) over the life of the Project. Therefore, total estimated beneficiaries is calculated as follows: 1,000 farm families x 25 sectoristas/NPP x 5 NPPs = 125,000 farm families.

b) Each of the 500 sectoristas receiving extension training and materials in years III, IV, and V of the Project will directly impact on 200 farm families; 200 farm families/extensionist x 500 extensionists = 100,000 farm families.

c) Through field days and applications of the technological extension packages on the demonstration sites, each demonstration site will indirectly provide technical production information to 1,000 farm families; 5 demonstration sites x 1,000 farm families = 5,000 farm families.

d) Each of the Regional Service Laboratories (RSL) will indirectly provide information based on their analysis to approximately 3,000 farm families per year: 3,000 farm families x 6 RSL x 5 years = 90,000 farm families.

Approximately half of the users of the RSL will also be recipients of services provided by the NPPs and therefore of the 90,000 farm families, 45,000 will be new beneficiaries.

Direct extension outreach	=	225,000 Farm Families
Indirect extension outreach	=	<u>50,000 Farm Families</u>
Total extension outreach		275,000 Farm Families

2. Commodity versus the Farm Management Approach

The Mission chose to utilize a commodity specialization approach to the REE System in Peru for a number of reasons. The most important considerations at this time are: (a) the scarce human resources remaining in the institutions; (b) a GOP strategy that calls for relatively rapid increase in productivity levels; and (c) the body of evidence that supports productivity change when extension, education and research elements become coordinated in a commodity package.

The limited quantity of experienced extensionists and applied researchers requires specialization if significant advances are to be made in productivity levels. The alternative of spreading scarce human talent over a vast array of crops and problems is unlikely to yield significant results in either overall production levels or in individual farm income. Thus, concentration in terms of personnel, locations and in-depth focus is essential. The strategy also relies on demonstrating the results of a coordinated approach on production to show the GOP the benefits which could result from further increases in financial support for technological development and utilization in the agricultural sector.

Favorable experiences using a commodity approach in South Korea, Kenya and many U.S. locations, as well as in Peru some years ago, also support the decision. In these countries, the commodity approach has increased yields of selected commodities when an effective outreach component was in place.

Other important considerations in selecting the commodity approach include:

- A body of knowledge on the selected commodities from indigenous and external sources, including international research centers, is available to be packaged for implementation of the extension activities during the initial phase of Project implementation.
- Most individual farmers and agrarian reform enterprises included in the Project concentrate on one or two crops as marketable surplus. These crops supply the cash needed by farmers to purchase technology inputs such as fertilizers and improved seed.
- The concentration of researchers and extensionists, particularly when they are in short supply, on a specific commodity has proven cost effective. Crop specific applied knowledge which is assembled (in extension packages) and disseminated through demonstration activities has shown higher adoption rates than that involving multi-crop extension activities.
- The heavy focus by national and international research centers on commodity organizational structures provide research which is compatible with this Project's approach.
- A total farm management approach is incompatible with Peru's situation of scarce human resources, relatively scarce technical knowledge, production patterns and scarce financial resources.

As the proposed system expands to include other commodities and the human and financial resource constraints are overcome, the commodity focus will begin to shift towards a farm management oriented REE System. The Baseline Study suggests that in Peru's case this will require a 10 to 15 year effort to build a system with sufficient depth to develop a farm unit approach to optimize small farm income.

3. Salary Supplements

The scarce quantity of professionally qualified Peruvians within the agricultural sector is an established fact supported by the recent Baseline Study. A ten year history of reduced budget support and the lack of attention paid to agricultural institutions discouraged careers in the agricultural sector. Many young Peruvians sought training in other fields, while those with agricultural training and experience sought employment in the private sector or left the country for more attractive economic opportunities with international and third country agricultural institutions.

Thus, if Peru is to increase agricultural production, this trend must be reversed. The principal task is to retain qualified people, encourage a return to agricultural professionalism and to encourage young people to seek further training in the agricultural sciences. Two major strategies embodied in this Project's design are aimed at accomplishing these goals;

- To demonstrate by development of a dynamic REE System that career opportunities are viable;
- To provide monetary incentives to reinforce the reality of the government's commitment to agricultural professionalism.

The first strategy focuses on the effectiveness of efforts in programming and implementing the REE System. Increases in career commitments to agriculture should parallel the results achieved as the system develops.

The second strategy concentrates on monetary incentives. It is expected that the incentives, varying in amounts according to the level of training and experience of the professionals involved, will serve to fortify the human capital available to the REE System.

The Project funded incentive strategy is designed so that by the end-of-Project the GOP will be paying all recurrent costs. A condition precedent to the Loan and a covenant requiring that the salaries be covered by the GOP for this activity will form part of

the Project's loan agreement. In fact, the institutions involved in the REE System, are currently developing the basis for civil service code reform for the Agricultural sector.

Some of the elements being analyzed for the new code include:

- Rewards and promotions tied to advanced training and experience;
- merit-type rewards linked to professional productivity;
- institutional rewards to professionals apart from promotion to administrative positions;
- differential rewards for productive professionals who choose to remain in local and regional research, education or extension sites; and
- differential rewards for those advanced professionals in areas of continued scarcity.

4. Crop Selection

The Baseline Study identified rice, corn, potatoes, cereal grains, and grain legumes as the first five major commodities on which the REE System will focus. The criteria used to select these crops included in the Project were: a) importance in both rural and urban diets; b) their importance in production terms to small farmers; c) potential for raw material import substitution; d) existing availability of experienced researchers and extensionists; e) relative availability of adaptable technology that could be focused on the target group; and, f) the relative potential for rapid rates of change in productivity levels.

The selected crops make up the bulk of the target group diets. For example, in the rural central sierra, the diets consist primarily of potatoes, grain legumes and corn with 84%, 87%, and 91%, respectively, of their consumption produced on farm.^{1/} The national consumption of tubers and roots (primarily potatoes) is 31% of the annual family consumption, whereas in rural areas this reaches 45%. Rice has increased in importance in the diets

^{1/} Marco Ferroni 1978 "Diet and Nutrition in the Peruvian Andes" Cornell University.

on a national level and small grains are important components of rural diets. The selected crops also are of extreme importance to the urban population of Lima, and will supply the necessary basic staples to the lower and middle urban classes.

The selected crops are of major importance not only to the diets, but also of the incomes of the small farmer. Many of the individual and associated enterprise farmers rely on production surpluses to provide income or barter goods to acquire production inputs or processed materials. Further, the locations of the NPPs have been selected to maximize the delivery of production technology to the areas where the potential for production surplus does exist.

Increased production of the five selected commodities will decrease existing import demand. At the present time, Peru imports major quantities of wheat, barley, grain legumes, corn and rice. Further, if production levels remain as they are and consumer demand continues to increase, Peru will have to import potatoes in the near future. Through a well directed and coordinated REE system emphasizing production of these commodities, imports will be decreased.

During the past ten years of reduced effort in research, extension and education activities some work continued with these five commodities. This signifies that a small but experienced group of individuals exists and that with additional assistance, can reasonably be expected to develop extension packages and make them available to the target group fairly quickly. This group of professionals will be particularly important during the Project's early implementation phase.

Another consideration in choosing this alternative was the availability of technical information which could be rapidly developed into extension packages. Encouraging results have been produced by the Peruvian research institutions for these commodities, but the information has not been made available to producers. The following table shows the Comparison of National Average Yields of * Several Commodities vs. Yields Obtained from Experimental Research.

* (INIA, 1979).

<u>Commodity</u>	<u>National Average</u>	<u>Experimental Average</u>	<u>Maximum Experimental</u>
	<u>Yield</u>	<u>Yields</u>	<u>Yields</u>
	(kg/ha.)	(kg/ha.)	(kg/ha.)
Potatoes	6540	40,000	50,000
Floury Corn	1751	5,000	12,000
Dent Corn	1650	7,500	11,000
Rice	4383	10,900	12,800
Wheat	945	4,000	8,307
Beans	790	2,620	4,235
Soybeans	1396	3,945	5,419

Direct comparison between these figures cannot be made because experimental research is generally conducted under optimum conditions, however, the data indicate that existing production knowledge for these commodities can increase on-farm yields significantly. In addition to indigenous technical information there are international (e.g. International Potato Center) research centers which have a body of applicable data which can be developed into extension packages during the early phases of the Project. The purposeful linking of extension specialists and regional researchers is to secure such data, to adapt it to specific cliental groups and to initiate demonstration type tests on actual farming units.

Based on the experience of researchers and extensionists and the availability of basic research results in the five commodities, the careful preparation and effective transfer of the extension packages will result in rapid rates of change in the production levels of these five commodities.

F. Environmental Impact

The USAID/Peru Project Committee has undertaken a complete Initial Environmental Examination (IEE) of the Project's environmental impact and has arrived at a recommendation for a negative determination with which the AA/IAC has concurred.^{1/}

^{1/} See Annex II Exhibit 3 for IEE.

IV. IMPLEMENTATION ARRANGEMENTS

A. Recipients and AID's Administrative Arrangements

1. Implementing Agency

Part III A sets forth an assessment of the expected administrative arrangements for Project implementation. The National REE Management Division located within INDA of the MAF, as previously discussed, will be the key implementing entity responsible for the Project. The Project Committee is confident, based on the Baseline Study analysis and the intensive review, that the GOP will be capable of managing the program (Further background on the implementing agency is located in Annex III Exhibit 1 and Part III A Administrative Feasibility).

2. A.I.D.

The role of USAID in Project implementation will be one of close coordination with the National REE Management Division (including the Title XII Contract Team) in monitoring overall Project performance, assisting the GOP in procurement training and contracting activities and contracting annual reviews and evaluations.

a. Monitoring

Monitoring will be exercised by a USAID Project Committee with the following responsibilities:

i. Project Management. The Project Manager for the Project will be assigned from the Mission's Agriculture Division of the Office of Agriculture and Rural Development. The Project Manager will work closely with the National REE Management Division and the Title XII technical assistance contract team to ensure that provisions of the A.I.D. Project Agreement and Implementation letters are met.

ii. Joint annual reviews. Joint annual reviews will be an essential feature of Project Implementation. The reviews to be undertaken by A.I.D. and the GOP, will be carried out on three levels: (a) an assessment of aggregate consequences over time; (b) a review of the administrative structure and functioning of the REE system and (c) an evaluation of the impact of the REE system on the small farmer.

iii. The Evaluation Officer from the Program Office will assist in doing the annual evaluations.

iv. The Mission Controller will review disbursement/reimbursement requests for conformity with A.I.D. regulations and will ensure that adequate financial controls are followed.

v. Additional Mission offices, such as the Executive Office and RIA, will be called upon as appropriate.

b. Reporting

The following reports will be required to assist the Mission in monitoring the Project:

1. A quarterly report from the National REE Management Division on activities and counterpart expenditures completed and projections of activities and counterpart expenditures for the next quarter.

2. The National REE Management Division will develop an annual implementation plan which will include a projection of project activities for the coming year in addition to an annual operating budget which will include inter alia GOP counterpart allocation and A.I.D. local currency requirements.

3. An annual report from the Title XII contractor on activities completed during the year and a proposed plan of activities for the coming year. Included in the annual report will be an assessment of the institutional status of the REE system.

c. Disbursement Procedures

No deviation from A.I.D. established disbursement procedures is anticipated. Materials and equipment procured in the United States or other Code 941 countries will be paid through A.I.D.'s standard letter of commitment/letter of credit procedure using either AID/W banking division or the recently delegated authority for Mission Controller to issue direct letters of commitment. Requests to open letters of commitment will contain appropriate certification that the items listed are required for the Project and are eligible for financing under the loan or grant. Disbursement for local currency costs will likewise be made in an established manner acceptable to A.I.D. These procedures will be established with the National REE Management Division.

d. Procurement Procedures ^{1/}

Goods and services procured under the Loan and Grant shall have both their source and origin in countries included in Code 941 of the A.I.D. Geographic Code Book and Peru, with the exception of motorcycles which will be procured from Code 935 (waiver attached to the Draft Loan/Grant Authorization). Appropriate reports will be required concerning compliance with procurement requirements such as source and origin, 50/50 shipping, etc. The National REE Management Division will have the responsibility for all procurement activities including the preparation of IFBs.

For the loan financed procurement of up to 75 motorcycles, the following justification is provided. The Borrower will procure up to 75 Honda Trailbike motorcycles (125-130 cc) on a proprietary basis for use by the extension agents and researchers visiting farms in outlying rural areas where largely unpaved access roads are in poor condition and long distances necessitate some form of motorized transportation. The low-g geared Honda Trailbikes are necessary to achieve the objectives under the project. Further, the only make of small motorcycles (less than 250 cc) with spare parts and maintenance facilities available in the project areas is Honda of Japan. Given the rugged terrain, vehicles are regularly in need of spare parts and maintenance services. Honda has established a local assembly plant for its motorcycles. However, essentially all components of these trailbikes are imported from Japan and thus the motorcycles are certified by SER/COM as originating in Japan. In addition, the locally assembled trailbike would cost approximately \$400.00 more per unit than the same model imported from Japan CIF. It is therefore necessary that a proprietary procurement waiver be granted to allow for direct importation from Honda Japan and a Code 935 (Special Free World) country (Japan).

For the A.I.D. grant-funded technical assistance program, host country contracts are envisioned. The GOP has both the capability and experience to develop, negotiate and implement host country contracts. An estimated 60 person months of Peruvian long-term T.A. at approximately \$250,000 LOP and 18 person months of Peruvian short-term T.A. at approximately \$27,000 LOP are envisioned for the project. The contracting of Peruvian technicians is expected to draw back to Peru qualified expatriate technicians to contribute to the REE system as well as assure the input of Peruvian technicians presently in Peru but not employed in the public sector. While it is anticipated that all T.A. will be administered through a Title XII contract, the contract has not yet been negotiated, and the Mission does not know whether all T.A. will be included in the contract. Therefore, we wish to reserve our option to contract separately with Peruvians for a portion of the required T.A. using grant funds. Off-shore training will be handled via the standard A.I.D. PIO/P process.

^{1/} See Annex III exhibit 7 for time-phased procurement plan and Annex III exhibit 8 for equipment list.

B. Implementation Plan

The project Agreement is expected to be signed by April 15, 1980, and the initial conditions met within the following 90 days. The initial conditions will name INIA as the Borrower's representative for the purpose of meeting the secondary conditions to disbursement of Loan funds which will establish the National REE Management Division's Project. In order to assure the timely meeting of the secondary conditions following approval of the Project Paper by AID/W, the Mission proposes to initiate actions in order to mobilize the grant-funded Title XII assistance. Such advisors should be on-board six months after the Agreement is signed. During this period, the personnel for the REE System will be selected for assignment as soon as possible after the secondary conditions are met.

It is anticipated that the First Project Evaluation to take place in June or July 1981 will initiate an annual cycle of planning, budgeting, and evaluation under the REE System.

RESEARCH, EXTENSION AND EDUCATION PROJECT

IMPLEMENTATION PLAN

Project Activity	I				II				III				IV				V			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
I. Extension Program																				
A. NFP																				
-Procurement of Vehicles and Equipment																				
-Selection of NFP Personnel																				
-Development of Extension Packages																				
-Updating of Extension Packages																				
-Application of Extension Packages																				
-Training of NFP Personnel																				
-Short-term																				
-Long-term																				
-Training of 500 Sectoristas																				
-Short-term T.A.																				
B. Regional Service Units																				
-Procurement of Vehicles and Equipment																				
-Selection of Personnel																				
-In Operation																				
-Short-term Training																				

Project Activity	I				II				III				IV				V			
	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
II. Research Programs																				
A. Regional Research Centers																				
-Procurement of Vehicles and Equipment	_____																			
-Selection of Personnel	_____																			
-In Operation	_____																			
-Training	_____																			
Non-Degree	_____																			
Degree	_____																			
-Short-term T.A.	-----																			
B. National Research Support																				
-Procurement of Equipment	_____																			
-Selection of Researchers	_____																			
-In Operation	_____																			
-Training	_____																			
-Short-term T.A.	-----																			
C. Demonstration Sites																				

III. Education Program																				
-Procurement of Equipment	_____																			
-Short-term Training	_____																			
-Long-term Training	_____																			
-Short-term T.A.	-----																			

Product Activity

I				II				III				IV				V			
I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV

IV. National REE Management

Division

-Technical Committee

-In Operation

-Long-term T.A.

V. Evaluation

C. Evaluation Plan ^{1/}

Since this Project represents an initial response to a complex set of long neglected problems in the agriculture research, education and extension system and its success or failure will determine in great part future GOP commitment to and budgetary support of expanded activities in this area, periodic evaluation of the Project is most essential. Thus, Project evaluation will be focused at three levels, covering an assessment of aggregate consequences over time, an assessment of the systems effectiveness and an assessment of the impact of the components comprising the system on the small farmer.

At the aggregate level for the nation and for each geographic region, as appropriate, an assessment activity will be established to evaluate:

1. Changes in product output by increase in yield and by increases in land in production;
2. Changes in product exports or imports reflecting raw material import substitutions and/or a change in trade balances;
3. Changes in real product prices reflecting responsiveness to supply shifts;
4. Changes in GOP budget support levels; and
5. Requested assessment by colleagues and other REE institutions to observe the structure and program.

At the level of the system itself, an array of measurable criteria will be established. However, the two broad categories to be considered are an assessment of planned versus actual results over time, and the other a set of measurable outputs. A comparison of planned versus actions results will focus on:

1. Number and quality of personnel trained;
2. Number and quality of commodity projects operative over time;
3. Quality of adaptive research as measured by changes in output;
4. Assessment of disbursements.

^{1/} Information gathered for purposes of evaluation will be disaggregated at the regional level and presented in aggregate form at the national level and will include data distinguishing male and female participants in the Project.

The second set of criteria at the system level will focus on changes in budgetary support, changes in publications, attractiveness to professionals that had left cooperating institutions and changes in the level of external support for the system.

The third level of assessment will be of selected components in the system. The alternate components are commodity programs, regional research and service laboratories, national research programs, and the varying levels of training extending from programs for sectoristas to staff training at the graduate school.

The assessment will focus on a comparison of planned versus actions implemented. For example, at the level of a commodity program operating at the rural and zonal levels comparisons will assess:

1. Number of staff members and qualities of these individuals;
2. Actual versus planned dispersements of technologic packages;
3. Responsiveness of individual farmers and agrarian reform enterprises to rates of adoption, output changes, requests for technical assistance, etc.;
4. Comparisons of attitudinal changes as viewed by the clientel groups relating to changes in extension capacities, to modes of communications, to the utility of technological packages, to constraints other than technology, etc.

Project evaluations will be conducted jointly on an annual basis by the Mission and INIA through the National REE Management Division, beginning after the first year of Project implementation. Short term T.A. will be provided to assist INIA in developing the conceptual model and specific evaluation methodologies, which will be approved by the Mission.



AGENCY FOR INTERNATIONAL DEVELOPMENT

UNITED STATES AID MISSION TO PERU

C/O AMERICAN EMBASSY

LIMA, 1 PERU

TELEPHONE: 286270

CABLE: USAID/LIMA

ANNEX I
Exhibit 1

CERTIFICATION PURSUANT TO SECTION 611(e) OF THE
FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Leonard Yaeger, the principal officer of the Agency for International Development in Peru, having taken into account among other factors the maintenance and utilization of projects in Peru previously financed or assisted by the United States, do hereby certify that in my judgment Peru has both the financial capability and the human resources capability to effectively maintain and utilize the capital assistance project: Research, Extension and Education.

This judgment is based upon the implementation record of the previous projects implemented in Peru, and the quality of the planning which has gone into this new project.

Leonard Yaeger
Director, USAID/Peru

Date: February 12, 1980



Lima, 06 de Febrero de 1980.

Of. No. 001 -80-AA-DM-INIA

Señor
Dr. Leonard Yaeger
Director AID/Perú
Lima

Tengo el agrado de dirigirme a usted en relación al Proyecto "Investigación, Educación y Extensión Agrícola", que ha venido elaborando la Misión USAID en el Perú con un grupo de representantes del Sector a mi cargo, dirigido por el Dr. Javier Gazzo Fernández Dávila, Director Ejecutivo del INIA.

El Proyecto estará orientado a implementar las recomendaciones del "Estudio de Base del Sistema de Investigación, Educación y Extensión Agrícola"; el mismo que recomienda la reorganización de los servicios de investigación, educación y extensión agrícola en un sistema que tendrá como fin estructurar y extender la capacidad de unidades de investigación, educación y extensión para impactar la producción y el desarrollo agrario; estructurar las bases para un flujo continuo de diferentes niveles de tecnología agraria que satisfaga las necesidades de pequeños y medianos agricultores, así como de las empresas asociativas; y, estructurar las bases para incrementar y reforzar la capacidad humana para la investigación, educación y extensión agrícola.

A fin de implementar el Sistema, el Gobierno Peruano solicita oficialmente a la Agencia para el Desarrollo Internacional-AID de los Estados Unidos de América, el otorgamiento de un préstamo de US\$9,000,000.00 en las condiciones más favorables que conceda la AID. Además, el Gobierno del Perú solicita oficialmente a la AID, el otorgamiento de un donativo por el monto de US\$2,200,000.00, para financiar la asistencia técnica y el adiestramiento necesario para implementar el Proyecto. La contrapartida nacional que se requiere es de US\$3,800,000.00 y será aportada en su equivalente en Soles.



**MINISTERIO DE AGRICULTURA
Y ALIMENTACION**

ANNEX I
Exhibit 2
Page 2 of 2

2)

Of. No. 07/-80-AA-DM-INIA

Mucho agradeceríamos que la presente solicitud tenga una especial consideración de parte de ustedes.

Aprovecho la oportunidad para expresarle las seguridades de mi deferente consideración.


Dios guarde a usted,
CARLOS GAMARRA PEREZ EGAÑA
General de Brigada EP
Ministro de Agricultura y Alimentación

D R A F T

PROJECT AUTHORIZATION

Name of Country: Peru

Name of Project: Agricultural Research,
Extension and Education
Project

Number of Project: _____

Number of Loan: _____

Number of Grant: _____

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Agricultural Research, Extension and Education Project for Peru involving planned obligations of not to exceed \$9,000,0000 in loan funds over a one year period and \$2,000,000 in grant funds over a five year period from date of authorization, subject to the availability of funds in accordance with the A.I.D. OYB/allotment process, to help in financing foreign exchange and local currency costs for the project.

2. The project consists of the creation of an Agricultural Research, Extension and Education (REE) system in Peru that will enable institutions involved in agricultural research, extension and education to increase agricultural production and to provide agricultural technology to meet the needs of small and medium sized farmers and associative enterprises.

3. The Project Agreement, which may be negotiated and executed by the officer to whom such authority is delegated in accordance with

A.I.D. regulations and Delegations of Authority, shall be subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

4. a. Interest Rate and Terms of Repayment

The Cooperating Country shall repay the Loan to A.I.D. in U.S. Dollars within twenty-five (25) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years. The Cooperating Country shall pay to A.I.D. in U.S. Dollars interest from the date of first disbursement of the Loan at the rate of (a) two percent (2%) per annum during the first ten (10) years, and (b) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

b. Source and Origin of Goods and Services

Goods and services, except for ocean shipping, financed by AID under the loan shall have their source and origin in Peru or in the countries included in AID Geographic Code 941, except as specifically stated in paragraph 4 f and except as AID may otherwise agree in writing. Ocean shipping financed by AID under the loan shall, except as AID may otherwise agree in writing, be financed only on flag vessels of the United States or Peru. Goods and services financed by AID under the grant shall have their source and origin in AID Geographic Code 941 or Peru, except as AID may otherwise agree in writing

c. Condition Precedent to Initial Disbursement (Loan)

Prior to any disbursement under the loan, or to the issuance of any commitment documents under the Project Agreement for activities financed under the loan, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D., evidence that the Cooperating Country has established a national research extension education (REE) administrative system for the direction, coordination, financing, planning and implementation of research extension and education activities under the project. Such evidence shall include a staffing plan for the REE system.

d. Conditions Precedent to Disbursement for Particular Activities (Loan)

(1) Prior to any disbursement under the loan or to the issuance of any commitment documents under the Project Agreement, to finance salary supplements, the Cooperating Country shall furnish in form and substance satisfactory to A.I.D., an implementation plan for providing salary supplements to specified REE employees working within the REE system. The implementation plan shall include plans for the assumption by the Cooperating Country of the cost of the salary supplements over the life of the project.

(2) Prior to any disbursement under the loan, or to the issuance of any commitment documents under the Project Agreement to finance vehicles, equipment and facility improvements, the Cooperating Country shall furnish, in form and substance satisfactory

to A.I.D., a procurement plan for vehicles and equipment and a plan for the installation of equipment over the life of the project.

(3) Prior to any disbursement under the loan, or to the issuance of any commitment documents under the Project Agreement, to finance training under the loan, the Cooperating Country shall furnish, in form and substance satisfactory to A.I.D., a time-phased implementation plan for training over the life of the project.

e. Covenants

(1) The Cooperating Country shall covenant that it will detail to the REE system on a permanent basis such personnel as are identified in the staffing plan for the REE system referred to in paragraph 4c.

(2) The Cooperating Country shall covenant to assume the cost of the salary supplements to specified REE employees in the manner set out in the implementation plan referred to in paragraph 4d(1).

f. Waivers

The following waivers to A.I.D. regulations are hereby approved:

1. AID source, origin and nationality regulations to permit the procurement up to 75 motorcycles under the loan from countries included in A.I.D. Geographic Code 935. In granting this waiver, I

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. Waiver of A.I.D. source, origin and nationality regulations to permit the procurement of goods and services under the grant from countries included in A.I.D. Geographic Code 941.

<u>Typed Name</u>	<u>Office Symbol</u>	<u>Date</u>	<u>Initials</u>
-------------------	----------------------	-------------	-----------------

Clearances:

- A.
- B.
- C.
- D.
- E.
- F.

Signature: _____

Douglas J. Bennet, Jr.
Administrator

AID HANDBOOK 3, App SC(1)	FORM. 6885-28 3:32	EFFECTIVE DATE JUNE 7, 1979	PAGE NO. SC(1)-1
---------------------------	-----------------------	--------------------------------	---------------------

SC(1) - COUNTRY CHECKLIST

Listed below are, first, statutory criteria applicable generally to FAA funds, and then criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

- | | |
|---|---|
| 1. <u>FAA Sec. 116.</u> Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? | 1. Yes |
| 2. <u>FAA Sec. 481.</u> Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. Government personnel or their dependents, or from entering the United States unlawfully? | 2. The GOP has taken such measures as are within its capacity to control narcotics traffic and is cooperating with U.S. efforts to eliminate production and trade in narcotics. |
| 3. <u>FAA Sec. 620(b).</u> If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? | 3. Yes |
| 4. <u>FAA Sec. 620(c).</u> If assistance is to government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) debt is not denied or contested by such government? | 4. No known instance. |
| 5. <u>FAA Sec. 620(e)(1).</u> If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities? | 5. The GOP is fully aware of USG requirements for prompt, adequate and effective compensation regarding expropriation of U.S. investments. To date there have been several expropriation claims settled to the satisfaction of both Governments, including Marcona Mining Company's claim in September 1976 and the Gulf Oil Corp. claim very recently. |

FORM NO. SC(1)-2	EFFECTIVE DATE June 7, 1979	FORM. DESIG. NO. 3:32	AID HANDBOOK 3, App 5C(1)
---------------------	--------------------------------	--------------------------	---------------------------

6. FAA Sec. 620(a), 620(f); FY 79 App. Act, Sec. 103, 114 and 606. Is recipient country a Communist country? Will assistance be provided to the Socialist Republic of Vietnam, Cambodia, Laos, Cuba, Uganda, Mozambique, or Angola? 6. No
7. FAA Sec. 620(i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? 7. No
8. FAA Sec. 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction, by mob action, of U.S. property? 8. No
9. FAA Sec. 620(i). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, invertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? 9. Information not available at Mission.
10. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters:
a. has any deduction required by the Fishermen's Protective Act been made?
b. has complete denial of assistance been considered by AID Administrator? 10. Information not available at Mission.
11. FAA Sec. 620; FY 79 App. Act, Sec. 603.
(a) Is the government of the recipient country in default for more than 6 months on interest or principal of any AID loan to the country?
(b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds? 11. No.
12. FAA Sec. 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the percentage of the country's budget which is for military expenditures, the amount of foreign exchange spent on military equipment and the 12.

A.12.

amount spent for the purchase of sophisticated weapons systems? (An affirmative answer may refer to the record of the annual "Taking Into Consideration" memo: "Yes, as reported in annual report on implementation of Sec. 620(s). This report is prepared at time of approval by the Administrator of the Operational Year Budget and can be the basis for an affirmative answer during the fiscal year unless significant change in circumstances occur.)

13. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

13. No.

14. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the AID Administrator in determining the current AID Operational Year Budget?

14. Informat
at Missi

available

15. FAA Sec. 620A, FY 79 App. Act, Sec. 607. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism?

15. No.

16. FAA Sec. 666. Does the country object, on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA?

16. No.

17. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing equipment, materials, or technology, without specified arrangements or safeguards? Has it detonated a nuclear device after August 3, 1977, although not a "nuclear-weapon State" under the nonproliferation treaty?

17. No.

B. FUNDING CRITERIA FOR COUNTRY ELIGIBILITY

B 1(a) Yes.

1. Development Assistance Country Criteria

a. FAA Sec. 102(b)(4). Have criteria been established and taken into account to assess commitment progress of country in effectively involving the poor in development, on such indexes as: (1) increase in agricultural productivity through small-farm labor intensive agriculture, (2) reduced infant mortality, (3) control of population growth, (4) equality of income distribution, (5) reduction of unemployment, and (6) increased literacy?

FORM NO. SE(1)-4	EFFECTIVE DATE June 7, 1979	FORM. NO. 32	APP. NUMBER 3, App SE(1)
---------------------	--------------------------------	--------------	--------------------------

b. FAA Sec. 104(d)(1). If appropriate, is this development (including Sahel) activity design to build motivation for smaller families through modification of economic and social conditions supportive of the desire for large families in programs such as education in and out of school, nutrition, disease control, maternal and child health services, agricultural production, rural development, and assistance to urban poor?

B 1(b) Yes

2. Economic Support Fund Country Criteria

N.A.

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights?

b. FAA Sec. 533(b). Will assistance under the Southern Africa program be provided to Mozambique, Angola, Tanzania, or Zambia? If so, has President determined (and reported to the Congress) that such assistance will further U.S. foreign policy interests?

c. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

d. FY 79 App. Act, Sec. 113. Will assistance be provided for the purpose of aiding directly the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?

e. FAA Sec. 620B. Will security supporting assistance be furnished to Argentina after September 30, 1978?

AID HANDBOOK 3, App 5C(2)	FRANK. CODE NO. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(2)-1
---------------------------	-------------------------	--------------------------------	---------------------

5C(2) - PROJECT CHECKLIST

Listed below are statutory criteria applicable generally to projects with FAA funds and project criteria applicable to individual fund sources: Development Assistance (with a subcategory of criteria applicable only to loans); and Economic Support Fund.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE?
HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PRODUCT?

A. GENERAL CRITERIA FOR PROJECT

1. FY 79 App. Act Unnumbered; FAA Sec. 653 (b); Sec. 634A. (a) Describe how Committees on Appropriations of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than \$1 million over that figure)?
 1. (a) Annual Budget Submission
 - (b) Yes
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?
 2. (a) Yes
 - (b) Yes
3. FAA Sec. 611(a)(2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?
 3. N.A.
4. FAA Sec. 611(b); FY 79 App. Act Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria as per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?
 4. N.A.
5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed \$1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?
 5. The Mission Director has so certified.
6. FAA Sec. 209. Is project susceptible of execution as part of regional or multilateral project? If so why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.
 6. The Project is specific to Peru and therefore not susceptible to implementation as a regional Project. While Project could be financed as a multilateral project no other agencies have expressed an interest; although project will be carried out to complement projects of multilateral donor agencies.

A.

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

8. FAA Sec. 601(b). Information and conclusion on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise).

9. FAA Sec. 612(b); Sec. 636(h). Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

12. FY 79 App. Act Sec. 608. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar, or competing commodity?

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(b); 111; 113; 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained

7. (a) N.A.

(b), (c), (d), (e) Project will foster private initiative and competition, encourage the development and use of cooperatives, discourage monopolistic practices, and improve the technical efficiency of agriculture by increasing agricultural production and increasing the productivity of small and medium sized farms and associative enterprises.

(f) N.A.

8. Project will use services of U.S. private enterprise.

9. The Project budget sets out the host country contribution to meet the cost of contractual and other services.

10. No excess U.S. owned foreign currencies are available in Peru.

11. Yes.

12. Project assistance is not for the production of any commodity for export.

B 1(a) The Project is designed to increase the productivity of small and medium size farmers and associative enterprises and is designed to further the objectives listed in B 1a(a).

B.1.a.

basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

- B 1(b) The Project will provide technical assistance to agrarian reform cooperatives.
- B 1(c) The Project is so designed.
- B 1(d) Yes
- B 1(e) N.A.

b. FAA Sec. 103, 103A, 104, 105, 106, 107.
Is assistance being made available: (include only applicable paragraph which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source.)

b. Food and Nutrition - See financial plan for details.

(1) [103] for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; [103A] if for agricultural research, is full account taken of needs of small farmers;

(1) Yes. The project is specifically designed to increase income of rural poorer farmers.

(2) [104] for population planning under sec. 104(b) or health under sec. 104(c); if so, extent to which activity emphasizes low-cost, integrated delivery systems for health, nutrition and family planning for the poorest people, with particular attention to the needs of mothers and young children, using paramedical and auxiliary medical personnel, clinics and health posts, commercial distribution systems and other modes of community research.

(2) N.A.

(3) [105] for education, public administration, or human resources development; if so, extent to which activity strengthens nonformal education, makes formal education more relevant, especially for rural families and urban poor, or strengthens management capability of institutions enabling the poor to participate in development;

(3) N.A.

(4) [106] for technical assistance, energy, research, reconstruction, and selected development problems; if so, extent activity is:

(4) N.A.

(i) technical cooperation and development, especially with U.S. private and voluntary, or regional and international development, organizations;

(ii) to help alleviate energy problems;

(iii) research into, and evaluation of, economic development processes and techniques;

(iv) reconstruction after natural or manmade disaster;

1.1.b.(4).

(v) for special development problem, and to enable proper utilization of earlier U.S. infrastructure, etc., assistance;

(vi) for programs of urban development, especially small labor-intensive enterprises, marketing systems, and financial or other institutions to help urban poor participate in economic and social development.

c. [107] Is appropriate effort placed on use of appropriate technology?

c. Yes

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

d. Yes

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to the Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"?

e. The AID grant funds are not for capital assistance.

f. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental and political processes essential to self-government.

f. The Project is designed to reestablish Peru's agricultural research, extension and education system. The project paper describes how the project fits the needs, desires, and capacities of the people of the country.

g. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase or productive capacities and self-sustaining economic growth?

g. Yes.

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, including reasonableness of repayment prospects.

2.a. Peru has the capacity to repay this loan.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete in the U.S. with U.S. enterprise, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

2.b. The assistance is not for any productive enterprise which will compete in the U.S. with U.S. enterprise.

AID HANDBOOK 3, App 5C(2)	YR. 3:32	EFFECTIVE DATE June 7, 1979	PAGE NO. 5C(2)-5
---------------------------	----------	--------------------------------	---------------------

Annex I
Exhibit 4
Page 9 of 9

B.

3. Project Criteria Solely for Economic Support Fund

- a. FAA Sec. 531(a). Will this assistance support promote economic or political stability? To the extent possible, does it reflect the policy directions of section 102? 3.a. N.A.
- b. FAA Sec. 533. Will assistance under this chapter be used for military, or paramilitary activities? 3.b. N.A.

NNNN7V FSE015BRA414
PP RUFSLM
DE RUEHC #5954/01 3310553
ZNR UUUUU ZZH
P 262333Z NOV 79
FM SECSTATE WASHDC
TO AMEMBASSY LIMA PRIORITY 2095 -6
BT
UNCLAS SECTION 01 OF 22 STATE 305954/01

AIDAC

P.O. 12065N/A

TAGS:

SUBJECT: AG. RESEARCH, EXTENSION AND EDUCATION PID REVIEW

1. SUBJECT PID WAS REVIEWED BY DAEC NOVEMBER 9, 1979, AND WAS APPROVED.

2. THE FOLLOWING ISSUES SHOULD BE CONSIDERED DURING INTENSIVE REVIEW AND ADDRESSED IN THE PP:

A. PROJECT PURPOSE: TO SUPPORT THE INSTITUTION-BUILDING PURPOSE OF THE PROJECT, THE PP ANALYSIS SHOULD INCLUDE THE FOLLOWING: (1) BRIEF HISTORY OF DEVELOPMENT OF RESEARCH, EXTENSION AND EDUCATION (REE) SYSTEM, INCLUDING A.I.D. ASSISTANCE; (2) CURRENT STATUS OF REE SYSTEM (INSTITUTIONAL FRAMEWORK, BUDGET, STAFFING, FUNCTIONS), AND (3) DESCRIPTION OF THE SHORT-TERM AND ANTICIPATED LONG-TERM IMPACT OF THE PROJECT ON THE REE SYSTEM. THE END-OF-PROJECT STATUS FOR EACH OF THE THREE MAJOR SEGMENTS OF THE REE SYSTEM SHOULD BE DEFINED AS PRECISELY AS POSSIBLE. PARTICULAR ATTENTION SHOULD BE FOCUSED ON DEVELOPING INDICATORS OF THE ACHIEVEMENT OF THE INSTITUTION-BUILDING OBJECTIVES OF THE PROJECT.

B. INSTITUTIONAL RELATIONSHIPS: OF PARTICULAR CONCERN

DURING THE REVIEW WAS THE NATURE OF THE INSTITUTIONAL RELATIONSHIPS TO BE DEVELOPED UNDER THE PROJECT AND WHETHER THESE RELATIONSHIPS WERE VIABLE. THE PP SHOULD DISCUSS THE CURRENT INSTITUTIONAL RELATIONSHIPS WITHIN THE REE SYSTEM, THE MODIFICATIONS WHICH WILL BE MADE DURING THE PROJECT AND THE LONGER TERM CHANGES IN THESE RELATIONSHIPS. IN ADDITION, THE ADMINISTRATIVE/MANAGEMENT ASPECTS OF THE PROPOSED PROJECT SHOULD BE REVIEWED TO ASSURE THAT THEY WILL FUNCTION AS REQUIRED FOR EFFECTIVE

UNCLASSIFIED

PROJECT IMPLEMENTATION.

C. PROJECT DESIGN: IT WAS NOT CLEAR FROM THE PID THAT THE PROPOSED APPROACH FOR RESTRUCTURING THE REE SYSTEM IS AN OPTIMAL AND COST-EFFECTIVE ALTERNATIVE. FOR EXAMPLE, WHAT IS THE RATIONALE FOR SELECTING FIVE NPPS AND SIX RESEARCH CENTERS? SHOULD MORE EMPHASIS BE PLACED ON THE EXTENSION SYSTEM WITH THE RESEARCH EFFORT DELAYED OR SCALED DOWN? THE PP SHOULD DEMONSTRATE THAT THE PROPOSED MIX OF ACTIVITIES AND LEVEL OF FUNDING ARE NECESSARY AND SUFFICIENT TO ACHIEVE THE PROJECT'S OBJECTIVES.

D. PROJECT VIABILITY: IN VIEW OF THE GOP FISCAL CRISIS THE PROBABILITY THAT GOP WILL BE ABLE TO SUSTAIN ACTIVITIES INITIATED UNDER THE PROJECT AND TO EXPAND THE RESTRUCTURING OF THE REE SYSTEM WAS QUESTIONED. THE PP SHOULD ANALYZE THE CURRENT BUDGETS OF INVOLVED INSTITUTIONS, THE IMPACT OF THE PROJECT ON THOSE BUDGETS, AND ASSESS THE ABILITY OF GOP TO ASSUME RECURRENT COSTS OF THE NEW REE SYSTEM. IN ADDITION, THE PP MUST DEMONSTRATE THE NEED TO FINANCE GOP OPERATING AND SALARY COSTS WITH APPROPRIATED FUNDS. AT A MINIMUM, GOP COUNTERPART SHOULD BE PHASED TO ASSURE THAT GOP ASSUMES SUBSTANTIALLY ALL RECURRENT COSTS WITHIN THE LIFE OF THE PROJECT.

E. TECHNOLOGY AS PRODUCTION CONSTRAINT: THE PID ARGUES THAT AN IMMEDIATE IMPACT ON SMALL FARMER PRODUCTION IS ESSENTIAL TO ESTABLISH THE CREDIBILITY OF THE PROJECT, PARTICULARLY THE NPP SYSTEM. THE CRITICAL ASSUMPTION IS THAT THE PACKAGE OF TECHNOLOGY DELIVERED BY THE NPP WILL BE ADOPTED QUICKLY BY SMALL FARMERS. THE PP SHOULD ASSESS THIS ASSUMPTION BY EVALUATING THE RELATIVE IMPORTANCE OF OTHER CONSTRAINTS ON SMALL FARMER PRODUCTION INCLUDING FACTORS SUCH AS PRICE POLICY, AGRICULTURE CREDIT, MARKETING, AND CULTURAL IMPEDIMENTS TO INNOVATION. PARTICULAR EMPHASIS SHOULD BE GIVEN TO DEMONSTRATING THAT GOP PRICE AND MARKETING POLICIES WILL NOT SERVE AS A DISINCENTIVE TO ADOPTION OF TECHNOLOGY BY SMALL FARMERS.

F. CROP VS. FARM MANAGEMENT EXTENSION: THE PID PROPOSES TO ESTABLISH AN REE SYSTEM WHICH WILL PROVIDE FARMERS WITH ACCESS TO TECHNOLOGY BY CROP RATHER THAN ON THE BASIS OF A INTEGRATED FARM MANAGEMENT MODEL. CONCERN WAS EXPRESSED THAT THE PROJECT'S CROP APPROACH COULD INSTITUTIONALIZE A NARROW REE SYSTEM WHICH WOULD NOT SERVE THE NEEDS OF SMALL FARMERS IN THE LONG RUN. THE PP SHOULD ARTICULATE THE BASIS FOR ADOPTING THE CROP APPROACH AT THIS STAGE IN THE DEVELOPMENT OF PEPJ'S REE SYSTEM AND THE STRATEGY TO

BE FOLLOWED TO ASSURE THAT THE SYSTEM WILL BE FLEXIBLE AND RESPONSIVE TO THE NEEDS OF SMALL FARMERS. FOR EXAMPLE, IS IT EXPECTED THAT THE REE SYSTEM WILL EVOLVE TOWARD AN INTEGRATED FARMING SYSTEMS APPROACH? IF SO, WHAT STEPS WILL BE TAKEN DURING THE PROJECT TO ENCOURAGE THAT PROCESS? THE CRITERIA FOR SELECTING CROPS AND GEOGRAPHIC LOCATIONS FOR THE NPP'S SHOULD BE DETAILED. IN ADDITION, THE RELATIONSHIP OF THE PROJECT TO OTHER A.I.D. AND OTHER DONOR RESEARCH AND EXTENSION ACTIVITIES SHOULD BE DISCUSSED.

G. TRAINING: THE NEED TO HAVE IN PLACE BY THE END OF THE PROJECT A VIABLE SYSTEM TO MEET THE NEW AND RECURRENT

BT
#5954

UNCLASSIFIED

14, OCT 30 1954

NNNNVV FSB716BRA415
PP RUESLM
DE R'ZHC #5954/02 3310557
ZNR UUUUU ZZH
E 262333Z NOV 79
FM SFCSTATE WASHDC
TO AMEMBASSY LIMA PRIORITY 2096
BT
UNCLAS FINAL SECTION OF 02 STATE 305954/22

AIDAC

TRAINING REQUIREMENTS OF AN EXPANDED REE SYSTEM WAS DISCUSSED AT LENGTH. THE PP SHOULD DEFINE BOTH THE TRAINING REQUIREMENTS OF THE PROJECT AND THE SYSTEMS TO BE IN PLACE BY THE END OF THE PROJECT TO MEET THAT NEED. IN ADDITION, THE AMOUNT OF U.S. DEGREE TRAINING SHOULD BE REVIEWED AS WELL AS THE STEP TO BE TAKEN TO RETAIN HIGHLY TRAINED PERUVIANS IN THE REE SYSTEM. IT MAY BE APPROPRIATE TO CONSIDER ATTRACTING PREVIOUSLY TRAINED PERUVIANS BACK INTO THE SYSTEM AS A COST-EFFECTIVE ALTERNATIVE TO PROJECT-FUNDED TRAINING.

F. EXTENSION METHODOLOGY: THE PID ASSUMES EACH SECTORISTA WILL BE ABLE TO REACH APPROXIMATELY 1,000 FAMILIES DURING THE PROJECT. THIS COVERAGE WAS QUESTIONED DURING THE DAEC IN LIGHT OF PAST PERFORMANCE OF OUTREACH EFFORTS ELSEWHERE IN LATIN AMERICA. THE PP SHOULD DEFINE THE TECHNIQUES WHICH WILL BE USED TO DELIVER INFORMATION TO FARMERS AND ASSESS THE ANTICIPATED IMPACT OF THE INFORMATION DISSEMINATED. TO HELP DEFINE FARMER BENEFICIARIES, IT MAY BE USEFUL TO CONSIDER TWO LEVELS OF THEIR PARTICIPATION IN THE PROJECT: THOSE WHO WILL RECEIVE TIMELY, CONTINUING MONITORING AND ASSISTANCE IN DIRECT CONTACT WITH SECTORISTAS AND THOSE RECEIVING INFORMATION AND SUPPORT THROUGH INDIRECT OR INFORMAL CONTACT SUCH AS MASS MEDIA, ACCESS TO DEMONSTRATION PLOTS, ETC. IN ADDITION TO DEFINING THE VARIOUS TECHNIQUES FOR DELIVERY OF TECHNOLOGICAL INFORMATION, THE PP SHOULD

INCLUDE A DESCRIPTION OF THE ADMINISTRATIVE AND LOGISTICAL SYSTEMS SUPPORTING THE SECTORISTA. REFERENCE TO OTHER COUNTRY EXPERIENCE MAY BE RELEVANT IN DESIGNING THIS PROJECT ELEMENT.

I. PEST MANAGEMENT: RECENT PROJECTS OF THIS TYPE IN THE IAC BUREAU HAVE INCLUDED RESEARCH, EXTENSION, AND EDUCATION COMPONENTS FOR CROP PROTECTION/PEST MANAGEMENT. THE MISSION IS ENCOURAGED TO CONSIDER INCLUSION OF THIS

UNCLASSIFIED

UNCLASSIFIED

ANNEX 1F
Exhibit 1
15, 01 305954 Page 5 of 5

COMPONENT IN THE PROJECT. ASSISTANCE IN THIS AREA IS AVAILABLE THROUGH DR. F. WHITTEMORE, DS/AGR. MISSION SHOULD CONTACT HIM DIRECTLY IF INTERESTED.

3. IFF: WILL NOTIFY SEPTEL FOLLOWING APPROVAL OF NEGATIVE DETERMINATION. VANCE

LT
#6054

UNCLASSIFIED

**PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK**

Life of Project:
From FY 80 to FY 84
Total U. S. Funding \$11.2 million
Date Prepared: _____

Project Title & Number: Agricultural Research, Extension and Education (REE)

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
<p>Program or Sector Goal: The broader objective to which this project contributes:</p> <p>to further the socio-economic development of the Peruvian small farmers to increase the production and income of the rural population of Peru.</p>	<p>Measures of Goal Achievement:</p> <ol style="list-style-type: none"> 1. Increased rate of growth of most basic agricultural commodities. 2. Increased rate of growth of agricultural sector 3. Decreased level of food imports. 4. Increased rural per capita productivity. 5. Increased availability of food supply levels for the urban and rural poor. 	<p>For 1 to 6</p> <ul style="list-style-type: none"> - National Agricultural Statistics. - Population mobilization reports from the Labor Ministry . - Census Data. - A.I.D. and Implementing Agency reports 	<p>Assumptions for achieving goal targets:</p> <ol style="list-style-type: none"> 1. The GOP continues recognizing the need for better productivity levels as well as the redistribution of income in favor of the rural poor. 2. Sufficient budgetary allocations for investment in credit and infrastructure for the Ag. Sector are provided by the GOB 3. Adequate pricing policy for resource inputs and commodity outputs and maintenance. 4. Political stability prevails.

Project Purpose:	Conditions that will indicate purpose has been achieved: End of project status.	For 1 to 5	Assumptions for achieving purpose:
<p>To create an Agricultural, Research, Extension and Education System that will enable the institutions involved in agricultural research, extension and education to:</p> <p>a) Increase agricultural production by structuring the basis for enhancing and reinforcing the human resources required for agricultural research, extension and education.</p> <p>b) Provide for a continual flow of varying levels of agricultural technology which meets the needs of the small and medium sized farmers, as well as those of the associative enterprises.</p>	<ol style="list-style-type: none"> 1. A functioning REE System, coordinated by a permanent Management Unit. 2. Implemented NPPs in five commodities with increased output levels forcing a reduction in imports and originating a more stable supply of staple food products to the urban population. 3. An on-going training program to provide the necessary human resources required to implement a dynamic REE System. 4. An established information flow mechanism between the REE System, International Research Centers and U.S. Universities to capitalize an agricultural technology to replicate in Peruvian production conditions. 5. The GOP will have significantly expanded its financial and technical investments to the REE System. 	<ol style="list-style-type: none"> For 1 to 5 - Records of Ministry of Agriculture and Food. - Records of activity implemented by the Project Management Unit. - Scientific publications by researchers. - Statistics on domestic production. - International trade reports. - National Budget Law. - Annual joint evaluations. 	<ol style="list-style-type: none"> 1. All legal requirements for the institutionalization of the REE system are met. 2. Farmers accept innovative production technologies. 3. No major financial, political or climatological disruptions.

Outputs:	Magnitude of Outputs:	For 1 to 9	Assumptions for achieving outputs:
<ol style="list-style-type: none"> 1. National REE Management Unit. 2. National Production Programs (NPPs). 3. Regional Service Laboratories. 4. Regional Research Centers. 5. National Research Support Unit. 6. Education Program. 7. Demonstration Sites. 8. Farmers with improved production technologies. 9. Trained personnel. 	<ol style="list-style-type: none"> 1. One national unit based in Lima. 2. Five in operation, staffed with 36 technicians with five located at the NPP center and five located at each of the satellite centers. 3. Six fully equipped and in operation staffed with six technicians each and located at MAF facilities. 4. Five established at INIA facilities and staffed. 5. One unit functioning within INIA and staff with 50 researchers. 6. 480 man/months of short-term local training and 180 man/months of off-shore training. (This portion is included in 9 below) 7. Five established and operating at existing INIA facilities. 8. 125,000 using improved technological packages working with the five NPPs. 9. Approximately 2,750 man/months of training covering short-term and long-term. Including 360 man/months of off-shore training. 	<ol style="list-style-type: none"> For 1 to 9 - MAF records - USAID records - Project evaluation reports - Visual inspections - Publications 	<ol style="list-style-type: none"> 1. Project Plan implemented as scheduled. 2. A.I.D. and GOP funds are disbursed as planned. 3. Project procurement is delivered within expected time frame. 4. Technical assistance available on a timely basis.

Inputs:	Implementation Target (Type and Quantity)						Grand Total	GOP and USAID accounting records.	Assumptions for providing inputs:
	(In Thousands of U.S. Dollars)								
Investment Categories	Year I	Year II	Year III	Year IV	Year V				
I. Extension Program									
(A) National Production Programs									
A.I.D.	942	752	601	481	385	3161			
GOP	101	127	159	200	248	835			
(B) Regional Service Labs.									
A.I.D.	220	176	141	113	90	740			
GOP	63	79	99	124	155	520			
II. Research Program									
(A) Regional Research Centers									
A.I.D.	345	275	220	176	141	1157			
GOP	93	117	147	183	230	770			
(B) National Research Support									
A.I.D.	367	294	235	188	150	1234			
GOP	45	56	70	88	111	370			
III. Education Program									
A.I.D.	175	139	111	89	71	585			
GOP	29	37	46	56	74	242			
IV. National REE Management Unit									
A.I.D.	47	37	29	24	19	156			
GOP	13	17	21	26	33	110			
V. Technical Assistance									
A.I.D.	400	400	350	350	200	1700			
GOP	45	45	40	40	20	190			
Sub-total A.I.D.	2496	2073	1687	1421	1056	8733			
Sub-total GOP	380	478	582	717	871	3037			
Total A.I.D. + GOP	2885	2551	2269	2138	1927	11770			
Plus: Inflation & Contingencies	550	580	615	710	775	3230			
Grand Total:	3435	3131	2884	2848	2702	15000			

- Assumptions for providing inputs:
1. GOP complies with conditions precedent.
 2. The GOP provides the pertinent budget allocation for the Project.

DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
WASHINGTON, D. C. 20523

LAC/DR/IEE-80-6

ASSISTANT
ADMINISTRATOR

ENVIRONMENTAL THRESHOLD DECISION

Location : Peru
Project Title : Agricultural Research, Extension
and Education Project, 527-0192
Funding : \$9,000,000 Loan, plus \$2,200,000 Grant
Life of Project: Five years

Mission Recommendation:

Based on the Initial Environmental Examination, the Mission has concluded that the project will not have a significant effect on the human environment and therefore recommends a Negative Determination.

The Development Assistance Executive Committee of the Bureau for Latin America and the Caribbean has reviewed the Initial Environmental Examination for this project and concurs in the Mission's recommendation for a Negative Determination.

AA/LAC Decision:

Pursuant to the authority vested in the Assistant Administrator for Latin America and the Caribbean under Title 22, Part 216.4a, Environmental Procedures, and based upon the above recommendation, I hereby determine that the proposed project is not an action which will have a significant effect on the human environment, and therefore, is not an action for which an Environmental Impact Statement or an Environmental Assessment will be required.



Assistant Administrator for
Latin America and the Caribbean

12/21/79

Date

Clearances:

LAC/DR:Environmental Advisor:ROtto otto
DAEC Chairman:MBrown MBrown

INITIAL ENVIRONMENTAL EXAMINATION (IEE)

Project Location: Peru

Project Title: Agricultural Research, Extension
and Education Project

Project Number: 527-0192

Funding: \$9,000,000 Loan plus \$2,200,000 Grant

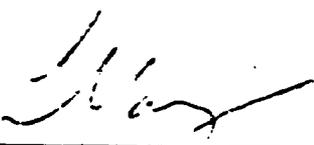
Life of Project: Five years

IEE Prepared by: Mario Quiroga
Senior Engineer
USAID/Peru

The USAID/Peru project, development committee for the Agricultural Research, Extension and Education Project has undertaken a complete Initial Environmental Examination (IEE) of the Project environmental impacts and has arrived at a recommendation for a Negative Determination as indicated in the Threshold Decision Section.

Concurrence: Date:

I have reviewed the Initial Environmental Examination prepared by the Project Committee for the Agricultural Research, Extension and Education Program and concur in the Threshold Decision recommendation for a Negative Determination.



Leonard Vaepær, Director
USAID/Peru

AA/LA Decision:

Based upon the Development Assistance Executive Committee review of the Project Identification Document, including the Initial Environmental Examination for the Agricultural Research, Extension and Education Program, I approve the Threshold Decision for a Negative Determination.

Assistant Administrator
for Latin America

INITIAL ENVIRONMENTAL EXAMINATION

I. Examination of Nature, Scope and Magnitude of Environmental Impacts:

a) Project Description:

The purpose of the Project is to consolidate and expand the Government of Peru's (GOP) national capacity for Agricultural Research, Extension and Education (REE) system in order to improve agricultural production.

To achieve the above stated purpose, the proposed \$9.0 million loan plus \$2.2 million grant will strengthen the existing REE system.

Project funds will be used to provide training at all levels for technical and extension personnel who will be engaged in the testing and adoption of technological packages based on existing research information, which will be transferred to the small agricultural producer, through extension activities.

It is intended to strengthen the research activities of six existing Regional Research Centers and six Regional Service Laboratories to supply backup services to the extensionist to assure the adequate application of the technological packages and a continuing flow of information to the producer. The Regional Research teams will consist of selected members from the universities and from other developmental organizations and will be located at existing GOP facilities.

The Project will concentrate mainly on the development of extension activities, covering the crops of most importance to the small farmer and to the GOP's plan to become self-sufficient in production of major food crops which are now imported. Thus successful completion of this five-year period program will have important economic considerations for the small farmer and the GOP. Satellite Centers covering much of the geographic production area of a particular crop will provide additional information related to production, commercialization and extension methodologies relevant to the particular crop and the geographic area.

In addition to the training program, financing will be made available for short-term foreign technical assistance when deemed necessary and will include the involvement of International Research Centers when appropriate.

AID financing will also be provided for the purchase of vehicles for personnel transportation, laboratory equipment, office and extension equipment, library support and minor construction to improve the existing physical facilities of the research and laboratory centers.

b) Identification and Evaluation of Environmental Impacts:

The nature and scope of the Agricultural Research, Extension and Education Project have been carefully reviewed following established criteria for conducting an Initial Environmental Examination. The conclusion is that the Project will not produce any negative environmental impacts. On the contrary, it will provide discipline research on plant and animal protection, irrigation and drainage practices and general soil management. Ultimately, the Project will benefit the small farmers improving their quality of life and income.

THRESHOLD DECISION:

For the above mentioned reason it is believed that no further environmental study is necessary and therefore a NEGATIVE DETERMINATION is recommended.

PROJECT: AGRICULTURAL RESEARCH, EXTENSION AND EDUCATION PROGRAM

Project N° _____

Attachment to Annex
 Initial Environmental
 Examination (IEE)

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Identification
 and
 Evaluation 1/

Impact Areas and Sub-areas

A. LAND USE

- | | |
|--|------|
| 1. Changing the character of the land through: | |
| a. Increasing the population----- | N |
| b. Extracting natural resources----- | N |
| c. Land clearing----- | N |
| d. Changing soil productivity capacity--- | M |
| 2. Altering natural defenses----- | N |
| 3. Foreclosing important uses----- | N |
| 4. Jeopardizing man or his works----- | N |
| 5. Other factors----- | None |

B. WATER QUALITY

- | | |
|---|------|
| 1. Physical state of water----- | N |
| 2. Chemical and biological states ----- | N |
| 3. Ecological balance----- | N |
| 4. Other factors----- | None |

1/ Use the following symbols:

N - <u>No</u> environmental impact
L - <u>Little</u> environmental impact
M - <u>Moderate</u> environmental impact
H - <u>High</u> environmental impact
U - <u>Unknown</u> environmental impact

October 1979

IMPACT IDENTIFICATION AND EVALUATION FORM

C. ATMOSPHERIC

- | | |
|--------------------------|------|
| 1. Air additives ----- | N |
| 2. Air pollution ----- | N |
| 3. Noise pollution ----- | N |
| 4. Other factors ----- | None |

D. NATURAL RESOURCES

- | | |
|---|------|
| 1. Diversion, altered use of water----- | N |
| 2. Irreversible, inefficient commitments ---- | N |
| 3. Other factors ----- | None |

E. CULTURAL AND SOCIOECONOMIC

- | | |
|---|------|
| 1. Altering physical symbols ----- | N |
| 2. Changes of cultural traditions ----- | L |
| 3. Changes in population ----- | L |
| 4. Other factors ----- | None |

F. HEALTH

- | | |
|---|------|
| 1. Changing a natural environment ----- | N |
| 2. Eliminating an ecosystem ----- | N |
| 3. Other factors ----- | None |

G. GENERAL

- | | |
|---------------------------------|------|
| 1. International impacts ----- | N |
| 2. Controversial impacts ----- | N |
| 3. Larger program impacts ----- | N |
| 4. Other factors ----- | None |

Annex III
Exhibit 1

PERU REE BASELINE STUDY 1/

1/ Draft translation from Spanish original --
See LAC/DR files for Spanish version.

TABLE OF CONTENTS

	<u>Page</u>
I. INTRODUCTION	1
A. Background	1
B. Importance	1
C. Objectives	1
1. General Objectives	1
2. Specific Objectives	2
D. Methodology	3
II. SITUATION	3
A. Agriculture and Food	3
1. Natural Resources	4
2. Crops and Livestock	4
3. Factors in Crop and Livestock Production	5
4. Agro-Industries	5
5. Food Consumption and Nutrition of the Population	5
6. Global Indicators in the Agrarian Sector	6
B. Agrarian Research	6
1. Physical-Biologic Research	6
a. Research on Crops and Livestock	7
b. Research on Forestry and Wildlife	7
c. Research on Water and Soils	8
d. Financial Resources	8
e. Human Resources	9
f. Infrastructure	10
g. Interinstitutional Coordination at National (public and private) and International Levels	11
h. Findings	11
i. Experiments Conducted during 1978	11
j. Improved Seeds	13
k. Seedlings	13
l. Breedings	13
m. Dissemination of Findings	13
2. Socio-Economic Research	13
3. Agro-Industrial Research	14
C. Agrarian Education and Training	15
1. Agrarian Sciences and Social Sciences Education	15
a. Education in Agrarian Sciences	16
a-1. Higher Level: University Education	16
a-2. Middle Level: Technical Education	17
b. Education in Social Sciences	18
2. Rural Education for the Producers	20
D. Agricultural Extension	21
1. Survey Analysis: Regional Deputy-Directors Group	21
2. Survey Analysis: University-Graduate Professionals Group	22
3. Survey Analysis: Mid-Level Technicians Group	23

	<u>Page</u>
E. Technical and Financial Cooperation	25
1. International Technical Cooperation	25
2. International Financial Cooperation.....	26
3. Cooperation between the National Institutions	27
F. Administration, Organization and Structure of the Agricultural Research, Education and Extension (REE) System	27
III. MAIN PROBLEMS	28
A. Agrarian Research	28
1. Physical-Biological Research.....	28
2. Socio-Economic Research.....	29
3. Agro-Industrial Research.....	30
B. Agrarian Education and Training	30
i. Agrarian Sciences and Social Sciences Education	30
a. Higher Level: University Education	30
b. Middle Level: Technical Education.....	31
2. Rural Education for the Procedures.....	31
C. Agricultural Extension	31
D. International Technical Cooperation	32
IV. RECOMMENDATIONS	32
A. General Recommendations	32
B. Specific Recommendations	34
1. Agrarian Research	34
a. Physical-Biologic Research	34
b. Agro-Industrial Research	34
2. Agrarian Education and Training.....	35
a. Agricultural Sciences and Social Sciences Education ...	35
b. Rural Education for the Producers	36
3. Agricultural Extension	36
4. International Technical Cooperation	36
V. MAIN FEATURES TO ELABORATE A PLAN OF ACTIONS FOR THE AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION SYSTEM	37
A. Objectives	37
B. Strategies	37
C. The System of Research, Education and Extension: Components and Elements	38
1. National Commodity Programs.....	39
2. Regional Research Centers: (CIAGs, CIFFs).....	39
3. Regional Service Laboratories	40
4. Graduate Programs	40
5. National Research Support	41
6. Local Administration	41
7. International Research Centers	42
8. International Technical Cooperation	42
9. Caretaker Operations	42

	<u>Page</u>
VI. ANNEXES	
A. List of Participants in the Study	44
B. Maps	
B-1 Location of the Centers for Crop and Livestock	50
Research (Centros de Investigación Agropecuaria- CIAGs)	
B-2 Location of the Centers for Forestry and Wildlife ..	51
Research (Centros de Investigación Forestal y de Fauna-CIFFs)	
B-3 Location of the Universities	52
B-4 Location of the Agrarian Regions of the Food and....	53
Agriculture Ministry	
C. Graps	
Graph 1: A Research, Education and Extension System	54
Designed to Serve the Farmer	
Graph 2: Human and Financial Resources Required by the..	55
REE System: Current Situation and Degree of Variation and Implementation	

P R E F A C E

As a country on its way to development, Perú suffers an ever expanding need for importing basic food commodities in order to fulfill the demands of its young and growing population and to counteract the effects of malnutrition which become more and more serious endangering the future of the country with deprived generations.

The "Baseline Study of the Agricultural Research, Education and Extension Systems" has been instrumental in identifying the above problem and in determining that proper utilization is not being made of national resources so as to achieve a higher production of food commodities through the available scientific and technological knowledge.

Agricultural research, education and extension are not operating as a full sequence and this is the reason for recommending that a research, education and extension system should be established, concentrating the scarce resources available to meet the farmer's needs as well as to increase food production. Likewise, the start of a scientific-technological approach is advisable in the agrarian sector to contribute to the solution of the food requirements which mankind will face in the future.

This study has been executed under Agreement No. 527-0166 signed by the Government of Perú and the Agency for International Development of the United States Government. Qualified Peruvian specialists have given their collaboration in the different fields involved and adequate advisorship has been provided by a group of experts from the North Carolina State University Mission who are fully acquainted with the problems of agriculture in Perú.

Considering the magnitude of this survey, a summary has been deemed necessary on the basis of the valuable information gathered by the nine work teams. The whole material is being published in three volumes: Volume I containing the summary, and Volume II and III containing complete data from each work team, including the numerous annexes that support their findings. The outline of a short, medium and long-term plan is included within the recommendations as a very valuable contribution by a special group.

Among many other studies conducted in the agrarian sector with a similar character, the present one has, over a brief period, succeeded in its attempts at determining problems and formulating the most appropriate recommendations to utilize the resources of different institutions through an integral system and to strengthen those institutions which give support and meet the needs of farmers, such as INIA, the universities and the Food and Agriculture Ministry.

ANNEX III
Exhibit I

As responsible for the coordination of this study, INIA's Executive Director deeply appreciates the dedication and efforts of all those who have participated in it. A special recognition is expressed to the Coordinating and Editing Teams for their work in trying to develop a final document.

Such efforts by specialists from Perú and the United States shall not be fruitless if due attention is given to this study by the top-executive level of the Agriculture and Food Ministry and by the Peruvian Government itself as part of the priorities assigned to the Agrarian Sector inasmuch as the recommendations offered lead towards an improved utilization of the national resources to help solve the critical food situation in this country.

Dr. Javier Gazzo Fernández Dávila
Executive Director
Instituto Nacional de Investigación
Agraria

I. INTRODUCTION

A. Background

The present study was carried out under Agreement No. 527-0165 signed on September 29, 1978 by the Government of Perú and the Agency for International Development (AID) of the United States Government. Originally expiring on May 30, 1979, the Agreement was extended to December 30, 1979.

Financial support in the amount of \$125,423 was provided by AID. Technical assistance was given by a Mission of the North Carolina State University through a Participating Agency Service Agreement (PASA No. AG/0155-1-79) with the U.S. Department of Agriculture and a Contract (NO. 52-319R-9-148) with the referred University.

Likewise, the Peruvian Government contributed with the amount of 5,036,000 soles. The responsibility for conducting the study was assigned to the Instituto Nacional de Investigación Agraria (INIA) (National Institute for Agrarian Research) in coordination with the Ministerio de Agricultura y Alimentación (MAA) (Agriculture and Food Ministry) and the Consejo Nacional de la Universidad Peruana (CONUP) (National Council of Peruvian Universities).

B. Importance

The current situation of agriculture in Perú implies the obligation of utilizing the available resources in a rational way in order to expand, as well as establish, those bases that permit a constant technological progress aimed at the fulfillment of future requirements.

Consideration is given to the fact that the actions of research, education and extension are not an efficient help for increasing the agrarian production when performed in an isolated way whereas if they were integrated under a system they would contribute to the development of the agrarian community in a valuable way.

The above implies a need for knowledge of the country's agrarian situation at present, particularly in the fields of agricultural research, education and extension, as well as for identification of those priorities that should be backed up by the Peruvian government.

C. Objectives

1. General Objectives

a. To supply MAA, AID and other institutions information on the agricultural research, education and extension organizations in Peru,

that is particularly needed for developing the agricultural sector and generally the rural sector.

b. To furnish a solid basis in order to evaluate the magnitude of institutional development for achieving the objectives of agricultural and rural development.

c. To identify priority schedules for international and national programs in order to strengthen the research, education and extension organizations, and, also, to devise a long-term planning strategy for the bilateral and multilateral assistance that should support the REE System.

d. To determine, on one hand, the demands of Perú for long-term resources, and, on the other hand, similar demands of U.S. Universities and other development organizations.

2. Specific Objectives

a. To obtain information on the quantitative and qualitative capacity that exists in the Peruvian educational institutions for training at all levels of agricultural specialists and other specialists in the field of rural development.

b. To evaluate the capacity of the research institutions in order to either adopt the existing technology or create a new technology, as well as to produce information aimed at improving the agricultural productivity and at developing the rural areas.

c. To evaluate the capacity that exists within the institutional structures for the dissemination of timely and useful information among farmers and also for influencing decision-making.

d. To determine the magnitude of such services as will be required by the REE Institutions to be able to accomplish the short, medium and long-term goals of agricultural and rural development.

e. To estimate the magnitude of the gaps that are likely to exist between the current capacity and the planned capacity of the institutions engaged in supplying services for developing the agrarian sector in particular and the rural sector in general.

f. To suggest the means through which AID or other cooperating institutions may contribute in the development of agricultural research, education and extension in this country.

g. To gather information and to establish a data bank that will permit the availability of material for future studies.

D. Methodology

In order to study the REE System a Leading Committee was appointed that was in charge of designating nine (9) work teams at national level. Likewise, a Coordinating Team from INIA and an Advisory Team from AID were designated. At local levels, seventeen (17) work teams were named to cover the total national territory.

An Organization and Functions Manual was prepared for the Leading Committee and Work Teams. Experts under contract with AID served as Advisors to the work teams at the national level.

A work plan was prepared by each one of the work teams at the national level that included specifications of the universe, scope and information sources as well as the methodology and budgets for performing the programmed activities.

Also, coordination meetings were held among the work teams with attendance and participation by the Advisory Team.

The statistical data and general information were compiled by means of questionnaires, forms, polls, meetings and personal interviews. Every group prepared a detailed report based on the qualitative and quantitative analysis of the information as gathered.

Towards publishing these findings, an Editing Team was named which has produced the present document on the basis of the information supplied by the work teams.

The information contained herein refers to the existing situation in Perú with regard to agriculture and food; Physical-Biological Research, Socio-Economic Research, Agro-Industrial Research; Agrarian Education and Training; Technical and Financial Cooperation; and Management, Organization and Structure of the REE System. The contents also include the identification of problems in every area studied as well as relevant recommendations and several annexes.

Most of the information refers to year 1978 and covers both public and private institutions in a nationwide level.

II. SITUATION

A. Agriculture and Food

All of the quantitative information available has been gathered that refers to natural resources, crops and livestock, factors in the crop

and livestock production, agro-industries, food consumption and nutrition of the population. Also, global indicators have been gathered that refer to the agrarian sector.

1. Natural Resources

Perú has a total territory of 128,521,560 hectares. The crop and livestock units occupy an area of 18,820,277 hectares of which only 3,691,416 hectares are utilized for farming. Of the latter, 2,361,585 hectares are harvested land and the remainder is fallow land.

A 35% of the farm land is irrigated as follows: 58% in the Coast, 39% in the Sierra and 3% in the Jungle.

The largest zones of continuous farming are found throughout 53 valleys in the Coast and their irrigation depends on the irregular discharge of the rivers. Dry farming is distributed as follows: 74% in the Sierra, 23% in the Jungle and 3% in the Coast.

As per Dr. Leslie R. Holdrige's "System of Classification of the Life Zones of the World", 84 life zones and 17 transitional zones are found in Perú within three latitudinal regions: tropical belt, sub-tropical belt and warm mild belt.

In a synoptic way, Perú's Ecological Map shows the biological and intricate interrelationship of the eco-systems that includes man and his cultural, social and economic manifestations within the national scenery.

2. Crops and Livestock

According to the 1972 National Crop and Livestock Census, the percentage distribution shown by the main crops in irrigated and dry areas, was as follows:

<u>Crops</u>	<u>Irrigated Areas %</u>	<u>Dry Areas %</u>
Rice	80.9	19.1
Barley	15.7	83.3
Corn	48.7	51.3
Wheat	18.0	82.0
Potatoes	21.7	78.3
Beans	57.8	42.2
Coffee	9.1	90.9
Pastures	57.8	42.2

3. Factors in Crop and Livestock Production

Most of the credit for the crop and livestock units is covered by the Banco Agrario del Perú. In 1972 this Bank supplied credit totalling 44,000,000,000 soles covering 463,200 hectares. With a coverage of 94% and 88%, respectively, rice and cotton were the commodities most benefitted. Following the importance were corn, coffee, potatoes and wheat.

The largest credits were granted in the Coastal Region where the utilization of technology determines a higher profitability and warrants for repayment of the loans. The latter are granted on the basis of production costs including input expenses, capital goods and labor. It is estimated that 40% of the crop and livestock units employ paid workers, mainly in an eventual way, for the attention of 55% of the total area occupied by production units.

4. Agro-Industries

Agro-industries reveal the following characteristics: a strong dependence on imported raw materials, a high economic concentration with the predominance of foreign capital in the manufacture of dairy and milling products, oils and edible fats in addition to enriched and diet-balanced products; also, a high demographic concentration in the Metropolis of Lima, and existence of unused facilities. The progress made by the agro-industries permits having an urban diet with a 50% calory-content and a 30% protein-content derived from processed food commodities.

5. Food Consumption and Nutrition of the Population

These two aspects have not been adequately studied. However, through poll results it has been found that the nutritional conditions of the Peruvian population are dramatic, particularly among the most vulnerable groups which are those of children under 6 years and expectant mothers.

In analyzing the consumption of proteins and calories in the Lima Metropolis, a decrease is noticed from 1972 to the present date.

With the object of reducing the nutritional problems in the vulnerable groups, concrete actions have been considered within a short-term development plan. These problems originate chiefly in the low income families and become more pronounced in the cities due to the great migratory flow from rural areas to urban areas, that results in food scarcity particularly among the underprivileged groups.

6. Global Indicators in the Agrarian Sector

For the last 25 years the Peruvian economy has shown that it has been increasing somewhat over 5% annually. During the first decade, agricultural production played a significant role with its commodities for the export trade. When the sixties began, the International Gross Product (IGP) began receiving larger contributions from the industrial sector that took the place of export agricultural production.

From 1950 through 1976, the economy grew at the approximate rate of 5.3% annually as a result of chief contributions from the growth rate attained in the industrial sector (7.1%) and the one attained in the services sector (5.8%). Meanwhile, the agrarian sector only reached a 2.9% rate that was below the rate of population growth (3.1%).

During the sixties and the first years of the 1970s, Perú had a favorable balance of trade due to the spectacular rise in the value of its mining and fishery exports.

The expanding difficulties in the international market of raw materials are originating a relative loss in the value of Peruvian exports, particularly of crop and livestock commodities.

B. Agrarian Research

1. Physical-Biologic Research

Oriented towards evaluating the capacity of national institutions and towards identifying their requirements, a diagnosis has been made of the research activities performed throughout 1978 on crops, livestock, forestry, wildlife, water and soils.

Prior to 1978, physical-biologic research for the purposes of agrarian development took place in different branches of the Ministry of Agriculture and the Ministry of Food. As of July that year and through an organizational law of the agrarian sector, these two Ministries were merged under the present Ministry of Agriculture and Food and the National Institute for Agrarian Research (INIA) was created to be in charge of conducting research on crops, livestock, forestry and wildlife, agro-industries and water and soils resources. In this sense, INIA was assigned the following functions:

- To plan, direct, execute and evaluate research and experimentation on crops, livestock, forestry, wildlife, agro-industries and water and soils resources, within the public agrarian sector.
- To propose norms as may be necessary in order to promote and systematize the agrarian research and experimentation that private or legal persons may carry out;

- To detect the needs for agrarian and agro-industrial research and experimentation;
- To promote and/or execute technological research that leads to the improved utilization, preservation and processing of agrarian commodities; and that leads, also, to the development of agro-industries;
- To supply the findings of agrarian research and experimentation to the agents and media of technology transfer;
- To carry out socio-economic studies aimed at reaching an optimum utilization of the agrarian and agro-industrial research;
- To coordinate with other public and non-public agencies the best way of utilizing for the agrarian research and experimentation such resources as are locally available; and,
- To provide for formation, training and upgrading in the diverse specialities which fall under INIA's scope.

The Universities with academic programs in agronomy also conduct physical-biologic research, in addition to their main function of teaching.

a. Research on Crops and Livestock

This research was formerly conducted by the General Direction of Research (DGI) and now has been undertaken by INIA. At regional level, it was carried out through four Regional Research Centers (CRIAS) presently called Centers for Crop and Livestock Research (CIAGS). At local level, the research was conducted through 14 Experimental Stations and 29 Experimental Sub-Stations, all of which are executing organs under INIA.

b. Research on Forestry and Wildlife

Information on research of this type dates back to 1963 when activities were initiated through the Institute of Forestry and Wildlife Research with participation by the Ministry of Agriculture (Forestry and Wildlife Service) and the National Agrarian University. The activities focused on the formation of personnel, the knowledge of forestry resources, and forestry pathology until 1970, when research was actually developed with the introduction of species.

Similar actions are carried out in the National Agrarian University since 1976, through the Program of Forestry Sciences.

Research of this type has also been conducted by the Ministry of Agriculture, specifically by the former Forestry and Wildlife Direction through its Centers for Forestry Research and Training, located at Pucallpa and Cajamarca and created by the Law of Forestry and Wildlife. The referred Direction presently operates as the Direction for Forestry and Wildlife Research under INIA and has two Research Centers for Forestry and Wildlife (CIFFs) - one located in the Sierra and the other located in the Jungle - which are considered as the agencies in charge of coordinating forestry research at a national level.

c. Research on Water and Soils

Water and soils resources have been studied for over 40 years in Perú though in a disperse and interrupted way. The studies have been made by different agencies many of which received support from foreign organizations.

The research on water resources has chiefly taken place in the coast and has been oriented to the development of information to improve the efficiency of water use, as well as to studying the water-soil-plant relation, the interaction between and other elements of production, the drainage of farm lands, and the use and utilization of underground water and sewage.

Insofar as soils research is concerned, this has particularly focused on soil fertility through detecting the response of main crops to the use of fertilizers and evaluating soil fertility through chemical analysis.

Studies have also been made on soil morphology and classification. Research has also progressed on the management of tropical soils. Preference has been given to conducting trials for the handling of saline soils and for the control of erosion inasmuch as the latter is a major problem in Perú.

d. Financial Resources

In 1978, the Ministry of Food allocated 429,850,000 soles for the activities of crop and livestock research. Said amount represented 8% of the Ministry's budget and 0.15% of the nation's budget. Due to budgetary cuts, 370,672,369 soles were spent during that fiscal period which reduced the above percentage to 0.12%.

On its part, the Ministry of Agriculture allocated 232,407,560 soles for the activities of forestry, wildlife, water and soils research, as well as, for other activities.

Information received from eight universities indicates that 503,173,866 soles were spent from their budgets; however, some of them had included in the research figures the total expenditures corresponding to other activities.

Further, private organizations spent the amount of 86,310,874 soles for crop and livestock research.

e. Human Resources

The Ministry of Food (DGI-CRIAs) was staffed with 39 researchers who had advanced academic degrees: 33 Masters and 6 Phds; 218 professionals and bachelors of sciences, 109 technicians and 302 administrative workers, all of whom represented, respectively, about 6%, 32%, 16% and 14% of the total number of personnel.

Information is incomplete from the other institutions engaged in research and so cannot be used for comparison purposes.

The following table illustrates the time of service in the research activities:

<u>Ministries and Universities</u>	<u>Percentage of Researchers</u>	<u>Years of Service</u>
Ministry of Food (DGI-CRIAs)	34%	0 - 5
	36%	6 - 10
	11%	11 - 15
	7%	16 - 20
	5%	21 - 25
	5%	Over 25
<hr/>		
Ministry of Agriculture (DIFF-CIFFs)	81%	0 - 5
(Sub-Dirección de Investigación de Aguas y Suelos)	100%	0 - 5
(Other Branches of the Ministry)	95%	0 - 5
<hr/>		
UNIVERSITIES	41%	0 - 5
	20%	6 - 10
	28%	11 - 15
	6%	10 - 20
	3%	21 - 25
	1%	Over 25

The table shown below refers to the salaries earned by researchers:

Ministries and Universities	Percentages of Researchers	Salary in Soles
Ministry of Food (DGI-CRIAs)	44%	21,000 - 30,000
Ministry of Agriculture (DIFF-CIFFs)	49%	Over 30,000
(Sub-Dirección de Investigación de Aguas y Suelos)	7%	19,000 - 20,000
	34%	Over - 30,000
UNIVERSITIES	43%	21,000 - 30,000
	21.2%	10,000 - 20,000*

* Only the basic remuneration has been considered in this particular case.

In regarding to the knowledge of foreign languages by research personnel, English predominates in every institution.

f. Infrastructure

- Field Trials

A total of 69,712 hectares was used for field trials. Of these, 3,283 hectares corresponded to CRIAs, 1,334 to CIFFs, 3 hectares to the Sub-Dirección de Investigación de Aguas y Suelos and 415 to other branches of the Agriculture Ministry; while 64,408 hectares corresponded to the universities and approximately 267 hectares belonged to private organizations.

- Machinery and Equipment

As per information available, about 50% of the tractors, other machinery and vehicles at the CRIAs and at the universities, were in semi-working or non-working conditions due, chiefly, to the lack of repair parts and maintenance.

- Facilities

In general, the greenhouses, offices, warehouses and stables are well kept. Also the laboratories are in good condition at some of the experimental stations and at every university.

Some laboratories are not in use mainly because of the lack of personnel, work material and repair parts.

- Library

Bibliographic material in all of the institutions engaged in research is update merely in a proportion of 20% and this is due to the lack of financial resources for purchasing books and subscriptions.

g. Interinstitutional Coordination at National (public and private) and International Levels

Coordination between the national and international institutions has not been adequate enough to optimize the resources available for the interchange of information.

However, coordination has indeed been more adequate among the researchers through meetings on general subjects, congresses, seminars, and meetings on special subjects.

For research on livestock, floury corn and beans, respectively, actions have been performed under national agreements signed by the General Research Direction, the CRIAs, the Universidad Nacional Mayor de San Marcos, the Universidad Agraria "La Molina" and the Universidad Nacional Agraria Pedro Ruiz Gallo.

Insofar as international projects are concerned, a pattern has not existed to set out coordinated, well-defined goals benefitting the country.

h. Findings

Results are available of the research on genetics improvement, particularly in the following commodities: rice, corn, wheat, sorghum, beans, soybeans, potatoes, sweet potatoes, yucca, bananas, cotton, alfalfa and tropical pastures, and also in the breeding of guinea pigs, cattle, poultry, alpacas, sheep, etc. These findings can be used by the producers.

i. Experiments Conducted During 1978

With emphasis on agricultural activity, the public sector was the largest contributor to the 1,693 experiments that were performed during 1978.

- The major part of the research took place in the coastal region with the sierra and jungle regions following.

- Most of the experiments relating to agro-industrial commodities were conducted by the public sector while the private sector gave a preference to industrial crops: sugar cane, and cotton.

- The following is a summary of the most important experiments, arranged in decreasing order:

		<u>Experiment No.</u>
CEREALS	Corn	164
	Rice	106
	Wheat	98
<hr/>		
TUBERS AND ROOTS	Potatoes	112
<hr/>		
LEGUMES	Beans	66
	Lima	12
	Lupine	8
<hr/>		
OIL CROPS	Soybean	46
<hr/>		
INDUSTRIAL CROPS	Cotton*	102
	Sugar Cane*	148
<hr/>		

* The public sector gave a preference to cotton while the private sector gave its preference to sugar cane.

- Livestock research, in its majority, was conducted by the public sector (Universities and CRIAs) mainly on pastures and fodder, and on cattle, sheep, alpacas and guinea pigs.

- The improvement of crop protection, cultural practices and fertilizers predominated among the agricultural research made by the public sector.

- The improvement of animal husbandry was emphasized by the public sector which conducted most of the livestock research.

- Forestry research has been conducted solely by the public sector, with an emphasis on silviculture.

j. Improved Seeds

Seeds were produced and distributed by the public sector (CRIAs and a few universities) as well as private enterprises and farmer producers. The largest quantities of tuber and root seed (potatoes) and cereal seed (rice, wheat, and corn) were produced and distributed by the CRIAs.

k. Seedlings

Seedlings were produced and distributed by both public and private sectors on a limited scale. Led by the CIEFFs and the Centro Nacional Vitivinícola, the major production was that of forestry seedlings. Also, the universities produced most of the fruit seedlings.

l. Breedings

Cattle, sheep, guinea pigs, rabbits and poultry were mainly produced and distributed by the public organizations but the latter did not fulfill the enormous demand of the livestock producers.

m. Dissemination of Findings

Research findings have not been disseminated at the corresponding levels on due time and sufficient proportion due to the unavailability of specialized personnel, equipment and financial resources.

Hence, because of the lack of an information system, the results of research have not reached the farmer.

2. Socio-Economic Research

Research of this type consists of studies which deal with agrarian and rural problem date back to the latter part of last century and share the characteristic of lacking in systematization.

The boom of socio-economic studies started in 1969 upon implementation of the Agrarian Reform Law. A number of official and private organizations emerged then with the intention of analyzing agrarian problems, while some of the universities established programs and conducted events with a similar purpose. Later the socio-economic studies focused on the subjects of physical-biologic research on crops and livestock and gave a greater emphasis to the factors limiting production and productivity as well as to the optimum use of factors for crop and livestock production, the identification and assessment of technological utilization and the creation and adoption of a crop-livestock technology.

At present, the socio-economic studies on agrarian problems are conducted by a number of official and private institutions, national and/or private universities, and individual researchers. The orientation of these studies depends on the type of institution involved as well as on its set objectives and the particular interest of its own researchers.

At the institutional level, during the 1968-1974 period, priority was given to the analysis and interpretation of agrarian problems. Official institutions were the ones that most prioritized this line in view of the need for diagnoses in order to enforce the Agrarian Reform Law.

During the 1975-77 period, the above priority was continued at the level of private institutions while at the universities other studies were initiated such as those on migration, crop and livestock production, marketing and rural activities and income.

Since 1973, the institutions became interested in studying the planning and development of rural areas as well as agrarian production and economic indicators.

Throughout the 1968-1978 period, 364 studies were carried out in the following proportion: 72.3% by the official institutions, 11% by the private institutions; 15.6% by the national universities and 1.1% by the private universities.

In the conduction of socio-economic studies in the agrarian sector, the lack of qualified personnel has been a limiting factor that contributed to the reduction in the number of research efforts. Other limiting factors have been those of the lack of dissemination of findings and the lack of an information system.

As verified, the personnel in charge of performing the socio-economic studies have been mainly composed of technicians in different specialties and in this proportion: Agronomists: 35%; Economists: 21%; Sociologists and Anthropologists: 25%; and Teachers, Lawyers and Psychologists, etc.: 19%.

3. Agro-Industrial Research

The efforts to carry out agro-industrial programs were initiated in 1965 with the "Programa de Alimentos Populares" (Program for Popular Food) at the Universidad Nacional Agraria. The General Law of Industries and the legal provisions supplementing it assigned a first priority to the Empresas Productoras de Tecnología Industrial for conducting programs of industrial research and development, while assigning a second priority to the industries that were engaged in producing essential popular food goods.

The work done refers to the part of agro-industries that is related with the manufacture of basic food products and which was prioritized for its promotion or implementation.

The development of agro-industries is considered to be not only advisable but also necessary in this country because it represents more job opportunities and a better standard of living among the rural population. There is a broad potential for developing the food industry that, if exploited, would permit overcoming current limitations such as the demographic and economic concentration existing in the Metropolis of Lima; the predominance of foreign investment in the manufacture of dairy and milling products, oils and edible fats and diet-balanced foods; and also the increasing use of imported raw materials.

For the past 25 years, a series of actions has taken place through the Universidad Nacional Agraria and the Instituto de Investigaciones Agro-Industriales that chiefly comprises the following:

- Basic and applied research on a laboratory and pilot plant scale for the utilization, preservation and processing of agricultural, livestock, forestry and fishery commodities;
- The study of new procedures and methods to make a rational utilization of the agrarian sector resources; and
- Plan for professional formation and training in the food industry to handle, study and develop such technology as may suit the local situation.

To develop their projects of technology research, some enterprises and institutions are using the amount of 2% from their net income. In accordance with legal provisions, every industrial enterprise must deduct such amount and establish with it a research fund. The latter is to be directly managed by the Instituto de Investigación Tecnológica Industrial y de Normas Técnicas (ITINTEC) if the enterprise does not make use of it.

According to the General Law of Industries, whether individually or jointly, enterprises can execute programs of technology research utilizing either their own research services or similar services of other public and private organizations engaged in this type of work, the requisite being that they must have ITINTEC's approval and supervision.

C. Agrarian Education and Training

1. Agrarian Sciences and Social Sciences Education

Higher education in the agrarian sciences and social sciences is included within the Peruvian Education System, since the latter comprises

three levels: Initial Education, Basic Education and Higher Education. The level of higher education consists of three cycles that are closely interrelated for the educational task although each one is complete by itself with its own objectives. A brief description is offered below:

- The first cycle, initiated at the Escuelas Superiores de Educación Profesional (Higher Schools for Professional Education) leads to a Bachelor's degree;

- The second cycle, initiated at the universities under the Peruvian University System, leads to either a license or a professional title; and,

- The third cycle, which according to the existing legislation is to be initiated at the Instituto Nacional de Altos Estudios (National Institute for Advanced Studies) and universities under the Peruvian University System, leads to either a master's or doctor's degree.

The Peruvian University System is composed of 33 universities (23 public and 10 private), one directing and coordinating agency (Consejo Nacional de la Universidad Peruana - CONUP) and several regional councils.

The universities, public and private, are distributed throughout five regions: 6 in the Northern Region; 16 in the Central Coast; 4 in the Central Sierra; 2 in the Eastern Region; and 5 in the Southern Region.

In 1978 there were 212,924 students enrolled. Included in this figure are 42,087 new students from a total of 196,367 applicants. The number of faculty members was 13,384.

a. Education in Agrarian Sciences

a-1. Higher Level: University Education

This level is represented by the Academic Programs (Faculties of Agronomy, Animal Science, Veterinary Medicine, Forestry Engineering, Agricultural Engineering, Food Industry, and Agricultural Economics). Further information is offered in the following table:

TOTAL NUMBER OF PROGRAMS FOR AGRARIAN SCIENCES EDUCATION

EDUCATION AT UNIVERSITY LEVEL

ACADEMIC PROGRAM			NUMBER OF STUDENTS ENROLLED	NUMBER OF GRADUATES	NUMBER OF PROFESSORS
NUMBER	AND	NAME			
14		Agronomy Programs*	7,109	662	446
7		Animal Science	2,552	116	172
5		Veterinary Programs	1,305	112	149
2		Agricultural Engineering Programs	1,759	70	106
3		Forestry Engineering Programs	1,336	39	90
4		Food Industry Programs **	912	33	58
7		Fishery Engineering Programs ***	2,764	229	

* Of the 14 programs, 12 are operating and 2 are being implemented.

** Of the 4 programs, 3 are operating and 1 is being implemented.

***Of the 7 programs, 3 are dedicated to Fishery Biology.

In all of the Academic Programs for Agrarian Sciences, studies last 10 cycles with an average total of 200 credits. Upon completion of these cycles, a Bachelor's Academic Degree is granted mentioning the specialty. After presentation and approval of a thesis, an Engineer's Professional Title is conferred mentioning the specialty as well. Professional Titles of Veterinarian and Fishery Biologist are granted in the respective cases of Veterinary and Fishery Biology studies.

Under the Peruvian University System, only one Academic Program exists for Post-graduate studies that confers a Master's degree in diverse specialities and is located at the National Agrarian University.

a-2. Middle Level: Technical Education

As a result of additions made in the Educational Reform Law on March 1972, most of the Institutos Nacionales Agropecuarios (INAs) (National Institutes for Crops and Livestock) that trained

technicians at a middle level, have disappeared. Some of these Institutes have been turned into Centros Educativos de Básica Regular (Centers for Basic Regular Education) while just a few of them have become Higher Schools for Professional Education (ESEPs). Relevant information is given below:

- Prior to 1978 there were 20 INAs (during that year practically none of them operated). There were 6,260 students and 226 professors. Number of graduates was 718 technicians. Complete studies lasted 5 years.

- There are 13 ESEPs which confer a Professional Bachelor's degree mentioning the specific specialty. Complete studies last 3 years throughout six cycles. There are 3,140 students and 118 professors. The number of graduates from 3 of these ESEPs is 108 bachelors.

b. Education in Social Sciences

The following information refers to the Academic Programs (Faculties) for Social Sciences Education under the Peruvian University System. In all of these programs studies last 10 cycles. Upon completion of the latter, a Bachelor's degree is granted mentioning the specialty.

In addition to the preceding variables, other aspects have been examined such as the following:

- Academic Level of the Professors

Studies made of the professors, i.e., their degrees and titles, serve as the yardstick for measuring their academic level. According to this, only 260 professors are post-graduates among the group of 1,684 in the programs surveyed. There are 106 post-graduates (Master and Ph.ds.) in a total of 446 professors in the Agronomy Programs; 9 post-graduates in a total of 172 professors in the Animal Science Programs; and 28 post-graduates in a total of 263 professors in the Economics Programs.

- Academic Experience of the Professors

The number of years in teaching work is the yardstick for measuring the academic experience. Among the group of 1,684 experience rates as follows: 731 professors, 0-5 years; 426 professors, 5-10 years; and 527 professors, over 10 years. In the Agronomy group of 444 professors, 158 show 0-5 years; 122 show 5-10 years; and 164, over 10 years.

TOTAL NUMBER OF PROGRAMS FOR SOCIAL SCIENCES EDUCATION AT UNIVERSITY LEVEL

DATA REFERRING TO THE ACADEMIC PROGRAMS IN GENERAL			DATA REFERRING TO THE ACADEMIC PROGRAMS SURVEY			
Name of the Academic Programs	Professional Titles Granted		Programs Surveyed	Number of Students	Number of Graduates	Number of Professors
	Programs	Title				
Economics (22)	18	Economist	8	6,884	531	263
	2	Economy Licentiate				
	2	Engineer-Economist				
	<u>22</u>					
Post-Graduate Program (1)	1	Masters in Agricultural Economics				
Sociology (12)	10	Sociology Licenciante	5	2,701	138	100
	2	Sociologist				
	<u>12</u>					
Anthropology (7)	7	Anthropology Licenciante	5	1,234	72	92
	<u>7</u>	Anthropologist (Title includes specialty)				
Social Services (6)	5	Social Worker	4	1,855	168	41
	1	Social Service Licenciante				
	<u>6</u>					
Social Work (3)	3	Social Work Licenciante				

- Knowledge of Foreign Languages by the Professors

Of the 1,684 professors, only 264, i.e., 15.7%, do speak a foreign language.

- Economic Standing of the Professors

Up to 1978, professors at the Agrarian and Social Academic Programs in Perú were paid according to a category and incentive structure. The latter oscillated between 11,800 soles, at its lowest point, and 29,400 soles, at its highest point.

Finally, a questionnaire was also prepared aimed at obtaining the opinion of university teachers and authorities in regard to the following aspects: number of universities; types of professionals; infrastructure requirements; equipment, library, human and financial resources; curricula; extent of involvement in politics among the students and its effects on the institutional work; and needs for training professionals at a middle-level.

2. Rural Education for the Producers

For the purpose of evaluating rural education for the producers, data were gathered from the 13 Zonal Offices of CENCIRA - Centro Nacional de Capacitación e Investigación para la Reforma Agraria (National Center of Training and Research for the Agrarian Reform) throughout the country.

Questionnaires were used in this attempt. Also, informal interviews were conducted with directors of CENCIRA and with beneficiaries of the educational services as well as with members of the Educational Committees in the associated crop and livestock enterprises.

The information obtained refers to institutions that served as observation units in the following proportion: 401 enterprises and 1 public agency, in the Agrarian Sector; 1 General Direction, in the Educational Sector; 1 program in the Health Sector; 1 National Commission in the Social Property Sector; and 15 organizations in the private sector.

Most of the financial resources available to CENCIRA are provided by international organizations. However, limitations in the national counterpart have restrained the major impact of these contributions.

Audio-visual aids and a closed television circuit are used in the training activities. Towards this end, CENCIRA has six audio-visual production units in different locations throughout the country, and also 35 modules for audio-visual utilization in the rural areas.

At the time of the survey, there were 19,790 direct beneficiaries of these educational services, who represented 5.4% in the number of rural producers benefitted by the Agrarian Reform Law.

The main lines of training were those of Associated Enterprise Management, Crop and Livestock Technology, Planning and Development, and Training Methods and Techniques. The most important among these lines was that of Crop and Livestock Technology with a 35.7% in the number of events conducted. At the beneficiaries' level, the farmers were the major group accounting for 91.9% in the total number.

The following are included among the private institutions that have supplied educational services in addition to CENCIRA's: Instituto de Educación Rural (Institute for Rural Education), Acción Comunitaria (Community Action), Fondo de Fomento de la Ganadería Lechera (Fund for Development of Dairy Cattle), Instituto Peruano de Estudios Cooperativos (Peruvian Institute for Cooperative Studies), Instituto Peruano de Fomento Educativo (Peruvian Institute for Educational Promotion), Instituto Internacional de Investigación y Acción para el Desarrollo (International Institute of Research for Development), etc.

Educational Committees had been established in just 73% of the 401 Associated Enterprises where their existence is a legal obligation. On the other hand, only 17% of such Enterprises performed educational actions for the farmers which may be a reflection of the limited support given to the Educational Committees by other departments in the enterprise.

D. Agricultural Extension

In order to evaluate the capacity of the Agriculture and Food Ministry in relation to agricultural extension activities, an analysis has been made of 1,047 questionnaires that were answered by personnel working at the regional, zonal and local levels. The three groups surveyed include 13 Regional Deputy-Directors, 304 university graduate professionals, and 730 midlevel technicians.

This evaluation covers the 13 Agrarian Regions in which the country's territory is divided. It also covers 95% of the personnel currently engaged in the Crop and Livestock Production System (Decree-Law No. 21169) and who are directly responsible for assisting the producers in the efforts to increase both production and productivity.

1. Survey Analysis: Regional Deputy-Directors Group

- The position of Regional Deputy-Director is held by professionals who have an academic degree. The majority of these

professionals have served over 10 years in the Ministry notwithstanding that some of them have not performed previously jobs relating to extension nor have received extension training and/or guidance.

- Dependent on the possibilities existing at each Agrarian Region, technological short courses have been carried out to train the personnel on crops programmed by the Crop and Livestock Production System. The training on agricultural extension has been merely collateral and continued to serve as a refresher of extension methodology within the curricula.

- A coherent method is not applied in the process of technological transfer in which those surveyed participate. This work is done under the false premise that all of the personnel have full command of extension methodology.

- Extension work is not likely to make a significant progress in disseminating new techniques without a substantial support from complementary actions such as credit, machinery, seeds, etc.

- The Regional Deputy-Directors maintain relationships with the experimental stations to secure the use of improved seeds as well as the participation of specialists in preparing technological packages and in training those technicians who handle extension actions.

- The Crop and Livestock Production System is erroneously thought of as an "Agricultural Extension System".

- The personnel who handle the Production System are over-utilized in other activities alien to the formal programming, to completion of crops and breeding plans and extension activities.

- All of those surveyed state that the extension activities can be substantially strengthened by providing the personnel with training and guidance for the use of technological packages and extension methods.

- The Crop and Livestock Production System does permit a prioritization of the crops and a rationalization of the scarce official resources. Nevertheless, a need exists for providing the involved institutions with adequate implementation, and also for strengthening the producers organization to attain a better participation from them.

2. Survey Analysis: University Graduate Professionals Group

- This group is composed of agronomists, veterinarians, and livestock technicians who have served in civil service a number of

years varying from 3 to 25. Their experience prior to their current positions includes such functions as production agents, specialists on specific crops, chiefs of rural agencies, and managers of agrarian cooperatives. The highest percentage in this group applies to those having under 10 years experience.

- The number of mid-level technicians working under these professionals is not uniform and presents extreme fluctuations. Likewise, the salaries of the latter do not bear any relation with the concept of equal pay for equal work.

- The official capacity for supplying extension services is quite limited in comparison with the public's demand and requires a strong implementation to cover the geographical scopes and large number of producers involved.

- The farmers are greatly interested in every technological innovation of use of resources which might permit them to obtain higher yields and profits therefrom.

- Work in the field is faced with limitations that originate in the following facts: administrative centralization, lack of means of transportation, lack of fuel and of travel allowances, high rates of illiteracy, insufficient credit assistance, lack and shortages of communications media, lack of personnel training and unavailability of equipment, pamphlets or brochures, audio-visual aids and other resources to put extension methodology into practice.

- In performing the transfer of technology, extension methods are used in an isolated and self-centered way. Proper attention is missing to turn these methods into effective tools for changing the farmer's aptitudes and a logical sequence is also missing in the strategy and procedures applied.

- The majority in this group have not received extension training and neither do they receive any on-the-job-training. A need is expressed by them for training in agricultural extension and on crop and livestock technology.

- A high percentage maintains contacts with the researchers and experimental stations, and the knowledge thus acquired has useful application in their activities. Technical information is collected by them mostly through the magazines, radio and newspapers; and on a very limited scale through pamphlets, bulletins or other means.

- There is no programmed or particular work with the rural youth and homemakers. Nevertheless, a high percentage has mentioned that the work with the rural youth is necessary.

- These professionals work with "natural leaders". However, utilization of the latter is neither systematical nor permanent, and they do not receive adequate training.

- The administrative support is neither adequate nor timely for the field actions but rather a constraining factor.

- Most of them say that the extension activities should be located within the General Agricultural and Livestock Direction of the Agriculture and Food Ministry.

3. Survey Analysis: Mid-Level Technicians Group

- The members of this group are those who work as assistants to the university graduate professionals and who operate directly with the farmers. Their education ranks at a middle with a predominance of crop and livestock technicians. The majority in this group has less than 10 years in the civil service.

- A great variability exists in the number of production units and areas under the care of each one of these technicians, depending on the regions, the crops and the livestock. The attention they supply is limited by the lack of transportation as well as the lack of travel allowances and equipment, in addition to the scattering of production units, the predominance of small farms and the deficiencies of communications media.

- Some methods of extension are used but without the systematical order that is required for achieving the desirable results. Also, they spend a good portion of their time in other actions non compatible with agricultural extension.

- The majority of these technicians identify the Crop and Livestock Production System as an "Agricultural Extension System". There has not existed an appropriate training on the philosophy, objectives and methodology of extension.

- The majority of them do not maintain any relationship with researchers and are not familiar with the experimental stations. They do not receive technical information to be applied in their work and just a few become informed through magazines, radio and pamphlets.

- To improve the field operations, higher salaries are required for these technicians along with training in extension and in crop and livestock technology in addition to the availability of equipment, travel allowances, transportation means and pamphlets or brochures.

- They mention that they work sporadically with rural youth and never with rural homemakers.

- In their operations they utilize "volunteer leaders" but the methodology to work with these leaders lacks in coherence.

- Most technicians point out that agricultural extension should be located within the General Agricultural and Livestock Direction.

Salaries are insufficient and even not so consistent with the costs of living as they used to be 10 years ago in the case of the professional, research, teaching, technical and administrative personnel engaged in developing agriculture. This is an impediment in retaining them and also in compensating and encouraging them adequately for their work.

E. Technical and Financial Cooperation

1. International Technical Cooperation

In Perú, International Technical Cooperation (ITC) is regulated by Decree-Law 18742 of January 1971 which defines it as a complement for the national efforts as well as responsive to the country's needs and interests in accordance with governmental policies.

The agencies responsible for ITC operations are the Ministry of Foreign Affairs, at international level; the National Planning Institute, at nationwide level; and the Sectoral Planning Offices in the Ministries, at sector's level.

In the Agrarian Sector, 63 projects have been carried out with help from 20 international sources; and, in 7 universities, 10 crop and livestock projects have been conducted with help from 6 international sources. These sources contributed with 3,173 million soles and 235 million soles, respectively. While the Peruvian contributions were 1,579 million soles and 148 million soles, respectively.

At present, 26 projects are being negotiated with technical cooperation from 9 sources. As estimated, their contributions will amount to 2,325 million soles and that of the national counterpart will amount to 1,102 million soles.

Upon analyzing the information that refers to ITC projects, the following is determined:

- The number of these projects is considerably high and most of them do not have a priority. For this reason, proper attention cannot be given to them through the existing capacity of the institutions involved.

- Reasons for this high number are, among others, the inadequate coordinations at the agrarian sector deriving in duplication of activities and the lack of project evaluation.

- Likewise, other problems derive from the above such as: lack of dissemination of the ITC results; in some cases, presence of experts in the country who do not meet the necessary requirements; monitoring of national projects by ITC; inconsistency between the destination of resources and the government's policy for development of the under-privileged zones; and lack of attention to the agrarian research since a mere 11% of the ITC resources has been allocated to it while the remaining 85% has been allocated to education and extension.

- Technical cooperation provided by some of the Western countries is non-reimbursable. A 60-70% of it is utilized for paying the personnel who come to Perú while the remaining 30-40% serves for training and donations.

- Technical cooperation as provided by other countries is reimbursable and its cost is quite high. Little utilization is made of such sources in Perú due to lack of knowledge and experience in their technology.

- Diverse ITC sources annually offer important scholarships which are not utilized in a great extent due to their untimely announcement and the long bureaucratic procedure involved in approving them. Despite this, during 1978, 99 professionals of the agrarian sector were trained as follows: 67% in the American Continent, 19% in the European Continent, 13% in the Near East, and 1% in the U.S.S.R.

- A long-term program for technical training is missing in the agrarian sector. Neither do attractions or incentives exist warranting for the retention of professional personnel that is highly qualified.

2. International Financial Cooperation

The legal base for external credit operations conducted by the public entities in Perú is Decree-Law 18281 of March 1970, and the agency responsible for approving every credit operation is the Ministry of Economy and Finances.

In the Agrarian Sector, 20 projects are in march amounting to a total figure of 157 million soles and financed by countries such as Holland, People's Republic of China, Switzerland, Yugoslavia and Federal Republic of Germany; by international organizations such as AID, BID and World Bank; and by multinational consortiums and Soviet enterprises.

Upon analyzing the information that refers to IFC projects, the following is determined:

- Of the above sum, 77.6% has been allocated to conduct 8 irrigation projects and 22.4% has been allocated to promote and develop crops and livestock. This cooperation will permit the following: to enlarge the agricultural frontiers by 303,000 hectares; to improve irrigation in other 313,000 hectares; to finance a dairy plant; to import dairy cattle and to establish rural settlements in the Central Huallaga area.

- External indebtedness of the agrarian sector is mostly oriented towards the irrigation projects which are chiefly located in the coastal region where farm land is limited and where the use of available technology and the creation of new technology are feasible.

- In contrast, IFC attention has not yet been given to regions that have a rich potential of natural resources, as occurs with the jungle that has over 60 million hectares.

- Procedures for the approval of international financial cooperation are long, troublesome and last no less than 3 years.

3. Cooperation Between the National Institutions

Aimed at obtaining technical cooperation and/or supplying services in the areas of agriculture, livestock, agro-industries, forestry and wildlife, the official entities (Universities and Higher Schools for Professional Education - ESEPs) sign agreements and contracts among them and also with Agrarian Production Cooperatives and private agro-industrial and agrarian enterprises.

This important pattern of inter-institutional cooperation is becoming more and more popular in Perú and it indicates that the Agrarian sector development is being accelerated through adequate coordination for a better utilization of the available resources.

F. Administration, Organization and Structure of the Agricultural Research, Education and Extension (REE) System

Support received by the institutions that are engaged in agricultural research, education and extension has been traditionally limited during the last ten years, the Peruvian government has rather been intent on consolidating the agrarian reform process as one of its priorities.

A common characteristic in the referred institutions is the loss of the more qualified and experienced members of their personnel due to the fact that they look for better paying positions in other sectors or

in other countries. Other common characteristics are their lack of infrastructure to become more functional and the scarcity of financial resources to improve their performance and services.

Maximum advantage is not taken of the international technical cooperation in the sense of technology and information available. On the other hand, international institutions and agencies whose technology requires adaptation to the local conditions, are willing to cooperate with the national programs. Rapid results can be demonstrated by many of the technological advances of international dimension if these are adapted to the local conditions.

Based upon the diagnoses made by the work teams of the "Baseline Study of the Agricultural Research, Education and Extension System", an outline has been drawn by a special group for the implementation of a 10-year program including strategies to change the present situation through actions and programs of high visibility. The mentioned outline is a part of the Recommendations chapter in this document.

III. MAIN PROBLEMS

A. Agrarian Research

1. Physical-Biologic Research

a. Appropriate mechanisms did not exist prior to 1978 for the integration of physical-biologic research as carried out by the DGI, universities and private entities.

b. There is a permanent exodus of highly qualified personnel due to the restrictions for carrying out research efforts and due also to budgetary limitations and the absence of incentives to develop this specialty field.

c. A small number of personnel is engaged in research activities whose level of academic training and actual experience in research are quite limited. Their salaries, also, are extremely low. Not a significant proportion of those professionals speak a foreign language.

The researchers, in a considerable number, perform functions that are alien to their vocation and/or training as happens to be the case with the few of them who are post-graduates and perform administrative tasks.

d. The experimental stations and sub-stations, in general, are in need of adequate implementation to carry out research in an efficient way.

e. Some of the laboratories are not being used due to the lack of personnel, reagents and repair parts.

f. Services rendered by the libraries are not adequate because the bibliographic material is not updated.

g. A system is non-existent for transmitting to the producer the verified findings of the research.

h. There is a strong conditioning relation between the research agency of the agrarian sector and the Sectoral Office for Agrarian Planning (OSPA) to set crop priorities and to allocate financial resources. This creates a preference on the activity of production over that of research which has intermediate and long-term results.

i. Diagnosis findings such as the native highland and tropical germplasm, the handling and preservation of water and soils resources, and the socio-economic aspects in most of the projects, are not taken into account while programming.

j. The necessary attention is not given to livestock research which is restrained by a lack of specialized personnel and financial resources. Besides, studies are not made about the handling of natural pastures in the Sierra and their relation with the increase of animal production.

k. Forestry research is not provided with sufficient financial support by the government and is maintained with the help of international technical cooperation sources. Further, no research is conducted on wildlife at the national reservations and hunting grounds.

2. Socio-Economic Research

a. There is a shortage of economic resources impeding the conduction of a larger number of studies. Also, there exists a lack of specialized personnel and difficulties exist to prepare new researchers as well as to disseminate and systematize the research information.

b. There is a need for coherent and integrated policies to carry out studies on the socio-economic situation.

c. There is an absence of incentives in the salaries of the personnel.

3. Agro-Industrial Research

a. A direct relationship has not existed between the objectives of technology research for the country's development and the evolution of private industries, and this, probably, is the cause for the absence of coordination between the private industries and the official institutions.

b. A change has been made in the obligation of all industrial enterprises to apply to the research projects on industrial technology a quantity of 2% which was deducted from their income prior to taxation. This percentage is currently deducted from the net income after taxation, which implies a reduction in the economic resources for technology research.

c. Through technical and/or advisory assistance, a small-scale transfer is made of the agro-industrial technology.

d. There is a limited availability of economic and financial resources to the official organizations to carry out research actions on agro-industrial technology.

e. Due particularly to economic expectations, there is an exodus to foreign countries of technicians who are specialized in the technology of food commodities.

B. Agrarian Education and Training

1. Agrarian Sciences and Social Sciences Education

a. Higher Level: University Education

- There is a large number of academic programs for the agrarian and related disciplines.

- There is also a large number of academic programs for the social disciplines.

- A massive number of students exists in these programs.

- There exists a low academic level in the group of professors.

- Shortages exist in the scientific and/or pedagogical formation of the professors.

- Deficiencies exist in the curricula structure of the programs.
- Adequate infrastructure, equipment and libraries are needed.
- Salary policies are deficient at the universities.
- There is a need for economic incentives and job positions for the university graduates.

b. Middle Level: Technical Education

- Most of the institutes for agricultural education at a middle level have disappeared.
- Higher Schools for Professional Education in Agriculture have been created with deficient curricula on technical subjects.
- There exist a need of adequate infrastructure, equipment and libraries.
- There is a low academic level in the group of teachers.
- There is a need for economic incentives and job positions for those graduating from the Higher Schools.

2. Rural Education for the Producers

- Coverage of these educational services is currently limited in spite of the efforts made by public and private organizations and also by the rural enterprises themselves.
- Integration and coordination are scarce in the educational actions which are carried out at the rural areas.
- Proper arrangements are missing in regard to common priorities, joint budgets and work teams of a multisectoral and multidisciplinary nature.
- The scope and effectiveness of the educational actions have been curtailed by the limitations of human and financial resources, particularly in the public organizations.

C. Agricultural Extension

1. There is no agency in charge under the Agrarian Sector structure to develop special actions of the agricultural extension.

2. The personnel involved have not received training in agricultural extension.

3. Salaries earned by those surveyed are not consistent with the costs of living nor with the functions performed by them for crop and livestock production.

4. The field operations of the personnel become restricted by the lack of transportation; the lack of equipment, or travel allowances and of pamphlets; and also by the budgetary reductions and those administrative measures which delay actions in the rural areas.

5. Neither the limited relationships between researchers and personnel conducting the technology transfer in the rural areas, nor the research findings are propagated with the necessary effectiveness.

D. International Technical Cooperation

1. Numerous projects exist with the sources of international technical cooperation. However, adequate attention is not given to them due to lack of coordination and, also, insufficient capacity of the institutions in terms of personnel and economic resources.

2. Support as provided by the sources of international financial cooperation to the activities relating with research, is not significant enough to allow for short-term growth of production and productivity.

3. Projects and financial resources which derive from the international technical cooperation are not prioritized properly and reveal a need for socio-economic studies.

IV. RECOMMENDATIONS

A. General Recommendations

1. Establish the necessary facilities for integrating research, education, and extension under a coherent system that converges to the production of food commodities and the solution of producer and consumer needs.

2. For the purposes of this system, the existing producer organizations, and similar future organizations, must participate jointly in those actions that refer to research, education and extension.

3. Establish the administrative facilities for managing public and external resources in a timely, dynamic and flexible way, acting as a supporter of actions for the success of the REE System.

4. The components of the REE System must provide their personnel with adequate preparation and training in the respective disciplines. They must also organize cadres as required for solving the problems that the agrarian production might develop in the future.

5. Establish an attractive salary structure giving emphasis to field personnel and aiming to retain specialized manpower while motivating them for an integration that should achieve the greater objectives of national development.

6. Establish those incentives and services that will render economic, social, cultural and recreational benefits to the system personnel.

7. Provide the REE System with needed infrastructure and services that will enable it to accomplish a medium and long-term plan through joint and coordinated actions.

8. All of the technical cooperation that is given to the agrarian sector by foreign sources must be chiefly utilized in strengthening the REE System.

9. Implement the Universidad Nacional Agraria as necessary in order that the Graduate Academic Program may render efficient professional educational services in those disciplines which national development requires. Also, create and implement post-graduate programs in other universities to carry out in-depth studies of specific lines of knowledge holding a socio-economic importance in certain zones of the country.

10. Provide the data bank of the Instituto Nacional de Investigación Agraria (INIA) with all the necessary information, including a compilation of the social-economic studies produced in the country, so that it may give an efficient support to the system action.

11. To set the system in march, it is advisable to formulate a short, medium and long-term plan in accordance with the National Development Plan and following the general pattern of this study.

B. Specific Recommendations

1. Agrarian Research

a. Physical-Biological Research

a-1. The agrarian sector must consider physical-biological research as the basic component for developing agriculture, livestock, forestry, water and soils that should be equipped with every needed resource in order to participate through adequate technology in the Agrarian Sector Development Plans.

a-2. Classify and select the experimental stations and sub-stations that will be in charge of the priority research programs. Also provide them with highly qualified personnel and with the required infrastructure and services, particularly, laboratories, equipment, vehicles and libraries.

a-3. In the research programs priority attention should be given to the scarce or substitute products.

a-4. Establish "Site" and "Subsite" Experimental Stations for specific-crop research. Implement same with a qualified staff and an adequate infrastructure. Multidiscipline teams should be organized with specialists of utmost level in the country.

b. Agro-Industrial Research

b-1. Determine the real potential of agro-industrial research throughout the country; in order to issue adequate policies and also to establish devices for bringing together the efforts of the public and private institutions that are doing agro-industrial research.

b-2. Bestow more importance on the services that are contemplated under the General Law, Regulations and Norms of Industry. Towards this end, the terms for utilization of such services must be reviewed.

b-3. Develop mechanisms aimed at stimulating agro-industrial research. For this purpose and with a preference on the substitution for imported raw products, integrated research programs should be established at a regional and national level by government and private institutions.

b-4. Coordinate concrete actions of agro-industrial research between INIA, Instituto de Investigaciones Agro-Industriales, ITINTEC and the Peruvian universities. Also, develop agro-industrial

extension mechanisms in order to promote the small and medium - size agro-industrial enterprises.

b-5. Capture financial assistance from internal and external sources to conduct an integrated activity in agro-industrial research. Such activity must be backed by the concurrent cooperation of the agrarian sector and other sectors.

b-6. Promote the creation of government and/or mixed agro-industrial enterprises on the basis of the feasible conduct of agro-industrial projects as proved by the respective studies on the techniques, economics and marketing involved.

2. Agrarian Education and Training

a. Agricultural Sciences and Social Sciences Education

a-1. The creation of any new academic program of agricultural sciences or social sciences should be justified by the respective studies according to the needs of the country.

a-2. The levels concerned in the Peruvian universities must plan a rational system of admissions and vacancies in the above-referred programs.

a-3. The training of the professoral staff should be performed in two ways as described below:

- Through reinforcements in the infrastructure, equipment, library and human resources of the Graduate Academic Program at the Universidad Nacional Agraria, enabling this program to supply appropriate services to the requesting universities; and,

- Through the creation and implementation of graduate programs that offer in-depth studies in specific lines of knowledge holding a socio-economic importance in certain zones of the country; and also, through the interchange of specialists between the universities.

a-4. Utilize post-graduate programs existing in foreign countries in those cases which demand a higher specialization.

a-5. At a middle level, tend to reinforce the curricula contents on crop and livestock in the Escuelas Superiores de Educación Profesional (ESEP), including therein an adequate knowledge of communication techniques, in order to warrant the appropriate training of professional bachelors.

a-6. Create agrarian education institutions and provide them with physical, human and financial resources permitting them to prepare mid-level, well-trained technicians.

b. Rural Education for the Producers

b-1. Through an adequate allocation of resources, expand the coverage and/or efficiency of the educational services that are supplied by institutions with a nationwide scope.

b-2. Develop rational efforts and resources in the institutions that supply educational services; and strengthen their operations of coordination, integration, supervision and control.

b-3. Improve the existing relationships between the institutions that supply educational services and the committees of associated enterprises which specialize in training.

3. Agricultural Extension

a. Organize agricultural extension within the Agriculture and Food Ministry as a service operating at countrywide, regional and local levels; and provide it with the required implementation so that it may either operate on its own or be transferred to another institution.

b. Integrate only in one agency the services offered by the state which give support to the agrarian production. Also, those services which are not located within the agrarian sector must be subject to an obligatory coordination as a guaranty for their utility.

c. Research and extension must achieve their principal integration at the field level, thus the procedures and strategies ought to be designed to warrant for such integration.

4. International Technical Cooperation

The existing projects together with International Technical Cooperation must be revised, prioritized and implemented to the investigation, education and extension system and new projects must be prioritized to support this system.

V. MAIN FEATURES TO ELABORATE A PLAN OF ACTIONS FOR THE AGRICULTURAL RESEARCH, EDUCATION AND EXTENSION SYSTEM

A. Objectives

For the rebirth of research education and extension institutions supporting Peruvian agriculture the following objectives are planned:

1. Structure and expand institutional capacity to impact on agricultural production and development.
2. Structure the foundations for the continuous flow of different levels of agricultural technology that meets the needs of small and medium farmers, as well as those of the cooperatives.
3. Structure the foundations for exchanging the human capacity for agricultural research, education and extension.

B. Strategies

1. Actions which can produce high visibility in a short time:

The current low level of investment can only be increased by a substantial amount if the institutions involved are capable of providing high impact results in a short time that justify future investment of scarce resources. Therefore, the first step in the overall strategy is to find a way to attract public attention and restore political support by high visibility in the next two years.

2. The available resources must be used with high degree of efficiency and concentration

The human resources available for research, extension and higher education have been reduced to alarmingly low levels, although a few component individuals are still to be found in each of these areas. The strategy to be developed must make maximum use of these scarce professionals. It is particularly important that the more skilled persons join efforts in a small number of impact programs concentrating the current scarce resources of all the government agencies in order to try to satisfy producer and consumer demands.

3. The actions must be oriented on the Peruvian agriculture products that are the most serious and politically sensitive

The concentration on a small number of impact programs must obtain consensus among the participating agencies and agreement among them is essential.

4. The number and level of capable technicians to efficiently take care of the sustained growth of the programs

A coordinated approach to this problem between the Ministry of Agriculture and Food, INIA, CENCIRA, universities and other development agencies will be essential. The maximum of appropriate evaluation procedures and university short courses is essential.

5. A higher level of capability among researchers, educators and extensionists must be developed through the strengthening of the current infrastructure of the graduate school at UNA and/or the use of international research centers or of external universities.

6. The proposed system in addition to being acceptable to the government of Perú should also prove to be fundable by International Technical Cooperation assistance and financial agencies interested in helping in Perú's development. For this purpose, the plan must exhibit the capability of maintaining a permanent staff and continuous services in order to guarantee economic impact within a reasonable period of time.

C. The System of Research, Education and Extension: Components and Elements

The strategy described above requires the implementation of a system which coordinates the resources of the various institutions which have responsibility to supply certain needs of the farmers.

The system will combine and coordinate the resources of the several institutions that have responsibilities in the agricultural field. The system is portrayed graphically in Figure 1, to show how the various components and elements within the several institutions focus sharply on the needs of the farmer.

The nine basic components of the system, and the elements within each are described below. The various public institutions are coordinated into a single system without losing their identities or their independence. The proposed strengthening of the various components is designed, therefore, to complement rather than duplicate the resources provided from public funds. The strategy provides for gaining maximum impact from existing scarce human talents and financial support and using the results to justify increased investment in this area. The system is to be strengthening on a highly selective basis in order to achieve maximum efficiency from investments.

Figure 2, illustrates the present status of these scarce resources and the relative rate at which they will be strengthened over the next 10 years.

1. National Commodity Programs

The nature of the National Commodity Programs will be to take existing technology and to adapt it and combine it with the local agricultural systems. The National Commodity Programs should be based at a center chosen on the basis of the following:

- Major production area;
- High development potential for the commodity;
- Availability of resources;
- Three or four satellite operations.

Thus, a Commodity Program would invite coordinated attacks from the resources of INIA, CENCIRA, the Extension Service, Agricultural Development Agencies, universities and other institutions. Each program would be served by a technical advisory committee including representatives of producer groups. The technical personnel must involve, for example, five to six researchers for each program, four to five extension specialists and twenty-five to thirty sectoristas.

The extension specialists will have the responsibility of analyzing local production problems, of advising and participating with the researchers in the synthesis of following the application of the package at the field level. Simultaneously, the sectoristas will take the technology to the farmers by means of technological packages prepared with the assistance of researchers and extension specialists in coordination with the producers. They can help in modifying these packages when the research advances are required.

The training will have high priority with all personnel of the system. This training will be both short and long term. Personnel of the Ministry of Agriculture and Food, INIA, CENCIRA, Universidad Nacional Agraria and other universities and institutions will form the training teams. Adequate support should be given to the personnel program. Such support should include: vehicles, greenhouses, farm equipment, office equipment, visual-aid equipment, reference books, extension publications, salary supplements, demonstration and research materials, etc.

2. Regional Research Centers: (CIAGs, CIFFs)

At selected regional CIAGs, discipline-research teams must be developed in support of commodity programs. Such regional research teams could be structured in areas such as: plant protection, irrigation and drainage, micro-economics, agro-industrial, soil management, etc.

ter serve several...
nel from INIA and universities, institutions and other development agencies. The teams would focus on providing applied technology packages for the commodity programs.

A program of research support, training, laboratory equipment and transport must be built for each agricultural commodity. In each component of the system, a salary supplement should be established in order to attract and motivate selected personnel.

3. Regional Service Laboratories

In support of commodity programs several service centers would be essential. Such centers would include facilities for soil tests, water analyses, disease analyses, mechanical services,

The support program for each service center would include laboratory equipment, transport and training. The support program must be structured.

4. Specialized Training

The major control mechanism for the national agricultural can and must give to this strategy is through their graduate school. The National Agrarian University in cooperation with other national

b. Academic degree training for the graduate school staff in sites external to Feri.

c. Academic degree training for the graduate school staff in sites external to Feri.

d. Academic degree training from other university staffs.

e. Academic degree training for the graduate school staff in sites external to Feri.

f. Strengthening of the professors staff of graduate programs with visiting professors from other national and external institutions.

BEST COPY AVAILABLE

Such an expanded program would require the strengthening of selected disciplines. Such support elements would include laboratory equipment, research and library supplies, field research, salary support schedules and internal/external scholarships.

5. National Research Support

At the national level, research capacities would be developed for more advanced work and towards technological self-sufficiency. Initial efforts would focus on staff training and move towards the establishment of such national level programs.

Such programs would include plant and animal protection, irrigation and drainage, macro-socio-economic, agro-industrial, soil science, natural resource management, etc. Researchers would be from INIA and selected members from other university staff.

This component of the system is critical to serve the new knowledge needs of established commodity programs and providing for the expansion of commodity programs.

The essential support elements would include laboratory facilities and equipment, library support, transport, salary incentives and particularly a strong internal and external scholarship programs.

6. Local Administration

There must be a Local Steering Committee for the components of this system that must be the nerve center that insures that the scarce resources are concentrated well enough for a commodity program to have impact in a relatively short time.

The basic rule in operation of a commodity program is that if insufficient resources are allocated to a particular program, it will not succeed and therefore should not even be started. This is a management problem that does not require a large number of persons, but it does require a strong management skill.

Other functions of the national administrative structure would include:

- a. Coordination of system components at local, regional and national levels;
- b. Coordination of training elements;
- c. Responsibility for support elements.

7. International Research Centers

Maximum advantage must be taken of the technology and information available in the International Research Centers. They are all eager to cooperate with national programs and they have much technology and information that requires adaptation to local situations. Much of the technology which they have can show quick results if adapted by knowledgeable persons to local conditions. More specifically the linkages might include the following:

- a. Readily available information in support of commodity programs;
- b. International Center Personnel in support of system components such as national commodity programs, regional centers, national research programs and graduate school programs;
- c. Scholarships for personnel in all components of the system.

8. International Technical Cooperation

This component can be grouped into three activities that serve specific components of the system:

- a. All existing external assistance programs that are involved with components of the system should be reviewed and modified to conform with this plan;
- b. Any new external programs to the extent possible should be specific and in direct support of the established system to the end that counterpart personnel and available resources are not spread too thinly. Possible mechanisms might include long term technical assistance in administration and system components as well as short term, highly specific linkages into extension, research and educational project components;
- c. Scholarships for personnel within all components of the system.

9. Caretaker Operations

Because the commodity programs will be highly selective of both personnel and facilities, some gainful use must be made of the remaining research resources.

Several possibilities come to mind. The use of research stations as production-demonstration facilities in one and another is their use for farmer training. This alternative suggests that many of the stations not directly involved in commodity research should be used as satellites

of the high-visibility, quick impact programs. The technology packages proposed for farmer use would be applied at these stations. This would provide (1) for close control and evaluation of the package, (2) for quick identification of production problems, and (3) for ready modifications of undesirable aspects of the technology.

Such production-demonstrations should provide some income to the system also, but a more important advantage is the training aspect. Many of the current research and extension staff have had little practical field experience. Temporary use of research stations for production - demonstrations would provide on-hands experience for all involved personnel; they would learn the real problems of producing a commercial crop using the same technology that will be recommended to the farmers. Then, when these people move out into the system, they will be able to "sell" their knowledge with the confidence gained from such experience. Further, the time spent in this activity will provide the administration with another opportunity to evaluate staff performance and potential.

Another alternative use for such facilities would be a "fomento" type of operation. The stations and personnel will be gainfully employed in producing seed, planting stock, improved breeds of livestock, etc. This, too, would provide inexperienced staff an opportunity to learn the practical aspects of production. It will provide income to the station and will serve as an evaluation mechanism for the personnel involved.

Therefore, though all stations and all personnel cannot be involved in the early stages of the new system, certainly all can be put to good use. And, as the system gains strength, these facilities and staff can be incorporated as their performance indicates and as the site becomes appropriate.

ANNEX A

PARTICIPANTS IN THE BASELINE STUDY OF THE AGRICULTURE
RESEARCH, EDUCATION AND EXTENSION SYSTEM

I. LEADING COMMITTEE

Dr. Javier Gazzo Fernández Dávila	INIA
Eng. Pedro M. González Avila	INIA
Eng. Víctor H. Torres La Jara	MAA
Eng. Pompeyo Díaz Zevallos	MAA
Eng. Gonzalo Silva Santisteban	MAA
Eng. Máximo Urbina Gutierrez	CONUP
Dr. Klaus Raven Buller	UNA
Dr. José Estrada Ancajina	UNA
Eng. Luis Paz Silva	INP
Eng. Efraín Palti Solano	INP

II. INIA COORDINATORS

Eng. Pedro M. González Avila
Dr. Flavio O. Vargas González
Eng. Eduardo Grillo Fernández

III. AID CONSULTANTS

Dr. Arthur Coutu
Dr. Jackson Rigney
Dr. Joy Laurence Apple
Dr. Douglas Gross
Dr. Herbert Scofield
Dr. Donald Galvan
Dr. Alphonse Chable
Dr. Gene Mathia
Dr. Jane Vella
Dr. Robert Mextley
Dr. Jim Seagraber
M.S. Orlando Olcese

IV. WORK TEAMS AT NATIONWIDE LEVEL

A. Agrarian Research

1. Physical-Biologic Research

Eng. Pedro M. González Avila	INIA
Dr. Flavio O. Vargas González	INIA
Eng. Robert Hooker Leguía	INIA
Eng. Miguel Garmendia Santisteban	INIA
Eng. Julio Lozano Matienso	INIA
Eng. José del C. Muro Castro	INIA
Eng. Raúl Romero Mejía	INIA
Dr. Klaus Raven Buller	UNA
Eng. Ignacio Lombardi	UNA
Dr. Douglas Gross	AID

2. Socio-Economic Research

Soc. Edmundo Inga Caray	INIA
Eng. Humberto Wester León	CENCIRA
Eng. Renán Ochoa Escalante	INIA
Dr. Julio Echevarría	UNA
Dr. Douglas Horton	CIP
Eng. Luis Paz Silva	INP
Eng. Efraín Palti Solano	INP
Dr. Arthur Coutu	AID

3. Agro-Industrial Research

Dr. Félix Quevedo Iturri	INIA
Eng. Miguel Fort Barcelli	INIA
Eng. José Telles Villena	UNA
Dr. Gene Mathia	AID

B. Agrarian Education and Training

1. Agrarian Sciences and Social Sciences Education

Eng. Máximo Urbina Gutierrez	CONUP
Eng. Pablo Espinoza Mena	OSE
Dr. Flavio O. Vargas González	INIA
Dr. Klaus Raven Buller	UNA
Eng. José Estrada Acajima	UNA
Dr. Herbert Scofield	AID
M.S. Orlando Olcese	AID

2. Rural Education for the Producers

Econ. César Farro Ortíz	CENCIRA
Soc. José L. Simonetti	CENCIRA
Dr. Jane Vella	AID
Dr. Jim Seagrabef	AID
Dr. Robert Maxtley	AID

C. Agricultural Extension

Eng. Víctor Hernán Torres La Jara	MAA
Eng. Estuardo Cava Castillo	D.G.A. y C.
Eng. Carlos Farromeque Dueñas	D.G.A. y C.
Eng. Néstor del Río Ganoza	D.G.A. y C.
Eng. Eduardo Izquierdo	D.G.A. y C.
Dr. Donald Galvan	AID
Dr. Alphone Chable	AID

D. International Technical Cooperation

Eng. José Salhuana Sánchez	INIA
Eng. Gonzalo Silva Santisteban	OSPA
Eng. Pedro Reyes	OSPA
Dr. Arthur Coutu	AID

E. Administration, Organization and Structure

Dr. Javier Gazzo Fernández Dávila	INIA
Dr. Carlos Velarde Suárez	INIA
Dr. Federico Anavitarte	UNA
Dr. Klaus Raven Buller	UNA
Dr. Arthur Coutu	AID
Dr. Jackson Rigney	AID

F. Food and Agriculture Situation

Eng. Eduardo Grillo Fernández	INIA
Eng. Mario Revilla	OSPA
Eng. Carlos Samaniego	OSE
Eng. Guillermo Montenegro	OSE
Eng. Guillermo Cubillas	INIA
Eng. Alberto Bengoa H.	INIA
Eng. Germán Valdivia	D.G.A. y C.
Eng. Luis Astengo	D.G.C.
Eng. Luis Fernández	Banco Agrario del Perú
Eng. Luis Garnica	ONERN
Eng. Luis Rivas	SENAMHI
Eng. Segundo Ortega	SENAMHI

V. WORK TEAMS AT LOCAL LEVEL

GROUP I. PIURA:

Eng. José Paredes Grieve
Eng. Antonio Silva Barreto
Soc. César Saldarriaga
Eng. Norvil Mera

EE. Chira
Agrarian Region - 1
CENCIRA
Univ. Nac. Tca. Piura

GROUP II. CHICLAYO:

Eng. José Hernández Leyton
Eng. José Dongo Montoya
Eng. Jorge Villegas
Eng. Luis Castillo

EE. Vista Florida
R.A. II
CENCIRA
Univ. Nac. Pedro Ruiz Gallo

GROUP III. CAJAMARCA:

Eng. Tommy Fairlie
Eng. Eduardo Velarde
Eng. Luis Duarte B.
Eng. Alvaro Arce

EE. Cajamarca
CIFF. Cajamarca
univ. Nac. Tca. Cajamarca
Z.A. Cajamarca

GROUP IV. TRUJILLO:

Eng. Javier Robles
Dr. Alfredo Machiavelo
Dr. Néstor Rojas B.
Dr. Guillermo Guerra C.
Eng. Hernán Tello

S.E.E. Paijan
Agrarian Region III
CENCIRA
Univ. Nac. de Trujillo
I.C.I.A.

GROUP V. HUARAZ:

Eng. Alberto Cueva Angulo
Eng. Manuel Vise Aparicio
Eng. Luis Sánchez S.
Eng. Luis Liceras Zárate

EE. Huaraz
Agrarian Region IV Huaraz
CENCIRA
Univ. Nac. Altunéz de
Mayolo

GROUP VI. LIMA:

Eng. Alfonso Ramos Falcón
Eng. Rafael La Torre Mazini
Prof. José Cueva Pérez
Eng. Francisco Delgado de La Flor
Dr. Ricardo Valdivia R.

CIAG-Centro La Molina
R.A.V. - Lima
CENCIRA
UNA
U.N.M.San Marcos-IVITA

GROUP VII. ICA:

Eng. Elkin Silva García
Eng. José Luis Rodríguez V.
Eng. Gilberto Alcántara D.
Eng. Julio Alcántara A.

EE.San Camilo - Ica
Z.A. Ica
CENCIRA
U.N. San Luis Gonzaga

GROUP VIII. AREQUIPA:

Eng. Aníbal Vásquez Z.
Eng. David Molina
Dr. Teodomiro Palomino M.
Dr. Teresa de Ballón

CIAG-Sur-Arequipa
R.A. VI - Arequipa
CENCIRA
U.N. San Agustín

GROUP IX. HUANUCO:

Eng. Isaias Herrera M.
Eng. Arturo Chuquillanque
Eng. Alejandro Mendoza A.
Eng.

S.E.E. Quisca-Huánuco
R.A. VII - Huánuco
CENCIRA
U.N. Hermilio Valdizan

GROUP X. TINGO MARIA:

Eng. Marco Nureña S.
Eng. Pedro Córdova Alva
Dr. Américo Díaz C.

E.E. Tulumayo
U.N.A. Jungle
Z.A. Tingo María

GROUP XI. HUANCAYO:

Eng. Gonzalo Campos Díaz
Eng. José Arizola Vicuña
Eng. Víctor Jinés Arroyo
Eng. Gustavo Javier

EE. Huancayo
R.A. VIII - Huaraz
CENCIRA
U. Nac. del Centro

GROUP XII. AYACUCHO:

Eng. Walter Salvador M.
Eng. Rolando Lajos Vásquez
Eng. Gotardo Cossio
Eng.

S.E.E Ayacucho
Z.A.
CENCIRA
U. Nac. de Huamanga

GROUP XIII. CUZCO:

Eng. Sergio Quevedo Willis
Eng. Willian La Torre
Eng. Carlos Astete Luglo
Eng.

EE. Cuzco
R.A. IX Cuzco
CENCIRA
U. Nac. San Antonio de
Abad

GROUP XIV. PUNO:

Eng. Guido Calderón Pérez
Eng. Gustavo Cuentas
Eng. Marco Valdivia Melgar
Vet. Dr. Jorge Pacheco

EE. Puno
R.A. X Puno
CENCIRA
U.N. Altiplano Puno

GROUP XV. TARAPOTO:

Eng. Manuel Lezcano
Eng. Manuel Osoreo Escurra
Mr. Roberto Stuardmill

E.E. El Porvenir
R.A. XI
CENCIRA

GROUP XVI. IQUITOS:

Eng. Roger Beuzeville Zumaeta
Eng. Ramiro Olivera F.B.
Eng. Aldo Acosta Vega
Eng. Augusto Padilla

EE. Iquitos
R.A. XII Iquitos
CENCIRA
U. Amazonia Peruana

GROUP XVII. TACNA:

Eng. Oscar Velarde Ruesta
Eng. Víctor Rondinel Cornejo
Eng. Víctor Najjar Guevara
Eng. Eli Espinoza

EE. Tacna
R.A. XIII
CENCIRA
U. Nac. Tacna

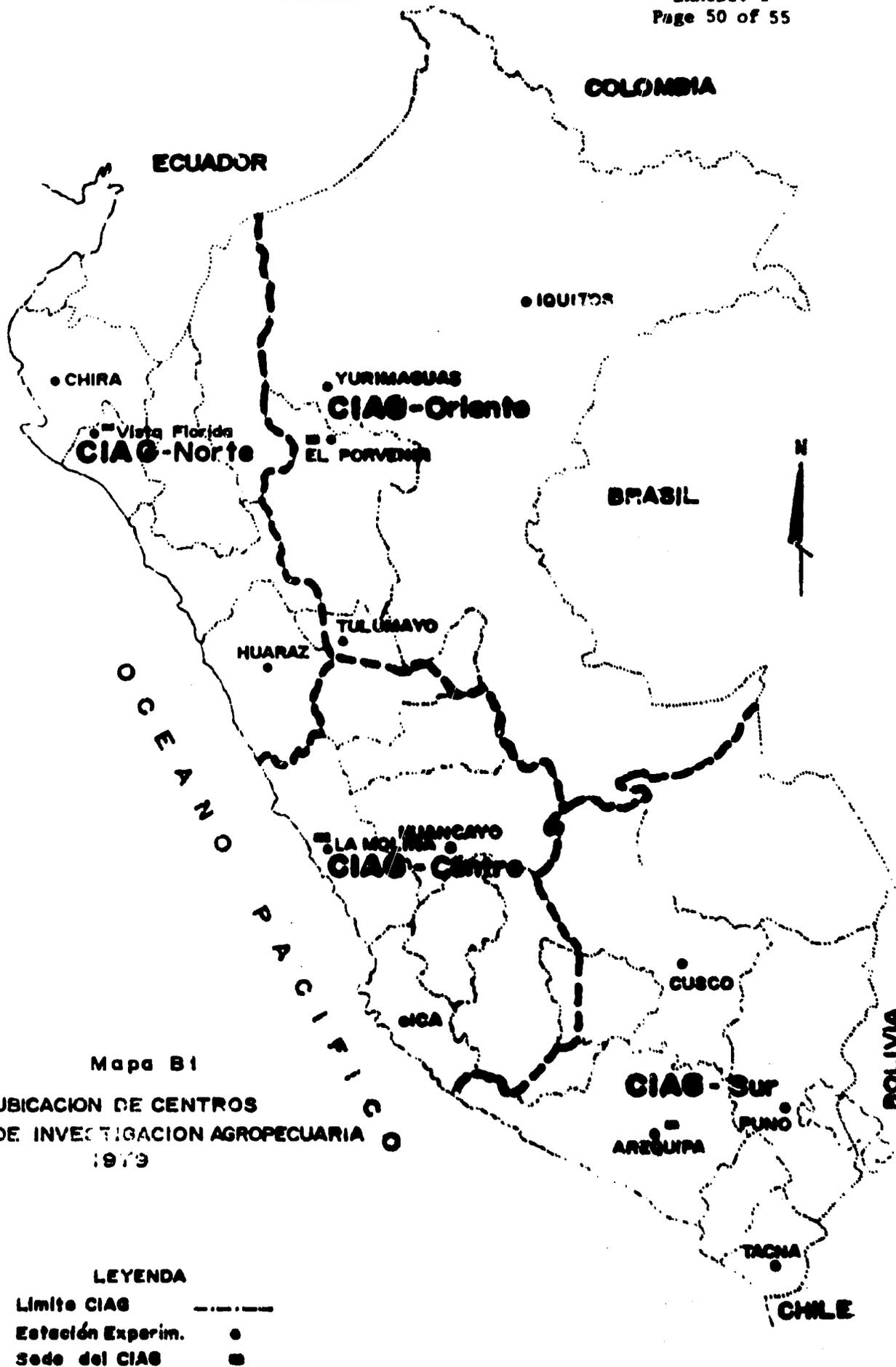
VI. EDITING TEAM

Eng. Pedro M. González Avila
Dr. Flavio O. Vargas González
Eng. Carlos Farromeque Dueñas
Eng. Máximo Urbina Gutierrez

INIA
INIA
D.G.A. y C.
CONUP

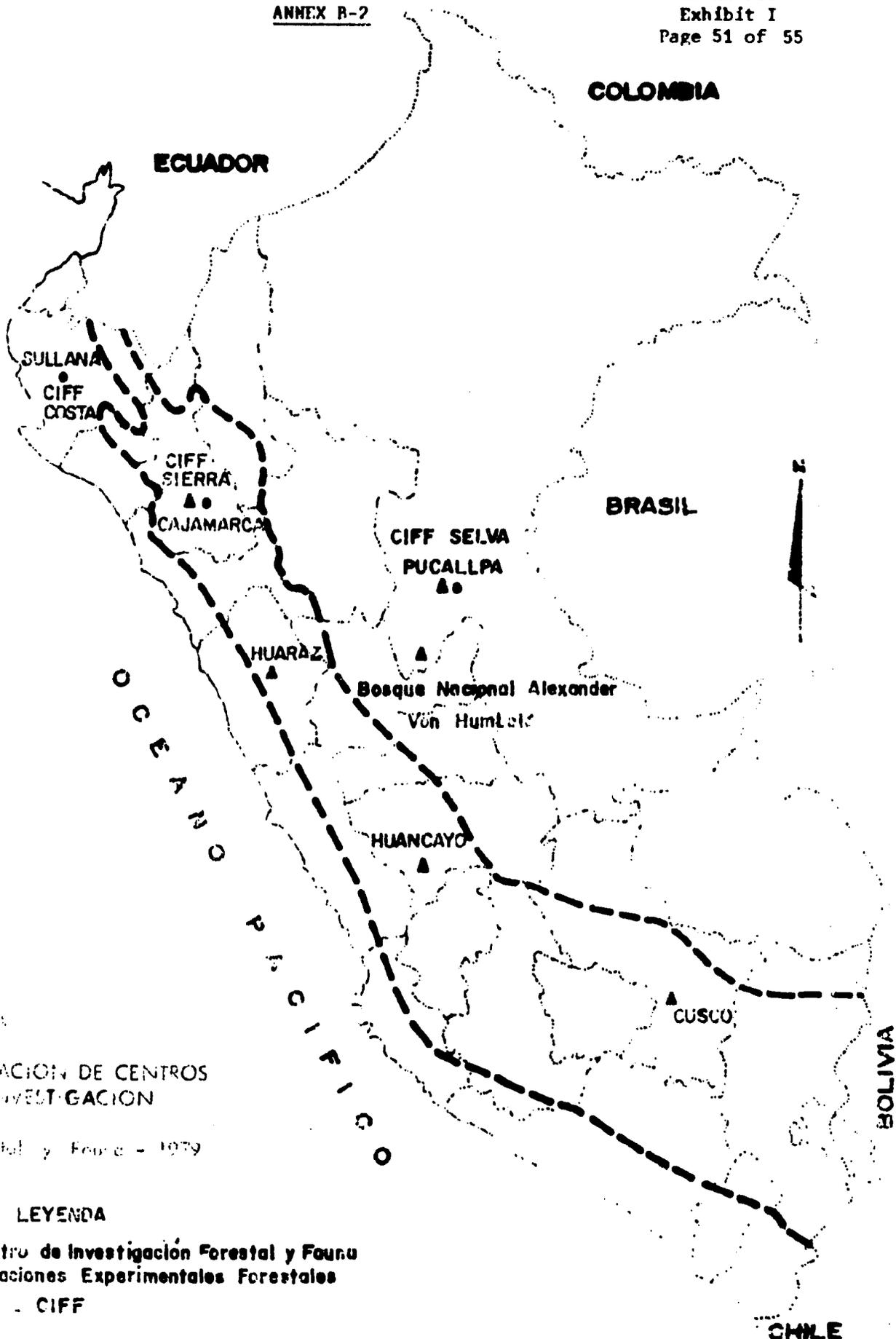
VII. SECRETARY

Mrs. Yolanda Angélica Vega de Aguilera



Mapa B1
 UBICACION DE CENTROS
 DE INVESTIGACION AGROPECUARIA
 1979

LEYENDA
 Limite CIAS - - - - -
 Estación Exprim. ●
 Sede del CIAS ■



MAPA

UBICACION DE CENTROS DE INVESTIGACION

Forestal y Fauna - 1979

LEYENDA

- Centro de Investigación Forestal y Fauna
- ▲ Estaciones Experimentales Forestales
- CIFI

UNIFICACION DE LAS UNIVERSIDADES ESTATALES Y PARTICULARES POR REGIONES

Año 1978

MAPA B₃**REGION NORTE**

1. U. N. de Trujillo
2. U. N. Técnica de Piura
3. U. N. Técnica de Cajamarca
4. U. N. Pedro Ruiz Gallo
5. U. N. Santiago Antón de Mayolo
6. U. P. de Piura

REGION COSTA CENTRAL

7. U. N. Mayor de San Marcos
8. U. N. de Ingeniería
9. U. N. Agraria
10. U. N. Federico Villarreal
11. U. N. de Educación F. G. V.
12. U. N. Técnica del Callao
13. U. N. José Faustino Sánchez Carrión
14. U. N. San Luis Gonzaga
15. P. U. Católica del Perú
16. U. P. Peruana Cayetano Heredia
17. U. P. del Pacífico
18. U. P. de Lima
19. U. P. San Martín de Porres
20. U. P. Femenina del Sagrado Corazón
21. U. P. Inca Garcilaso de la Vega
22. U. P. Ricardo Palma

REGION SIERRA CENTRAL

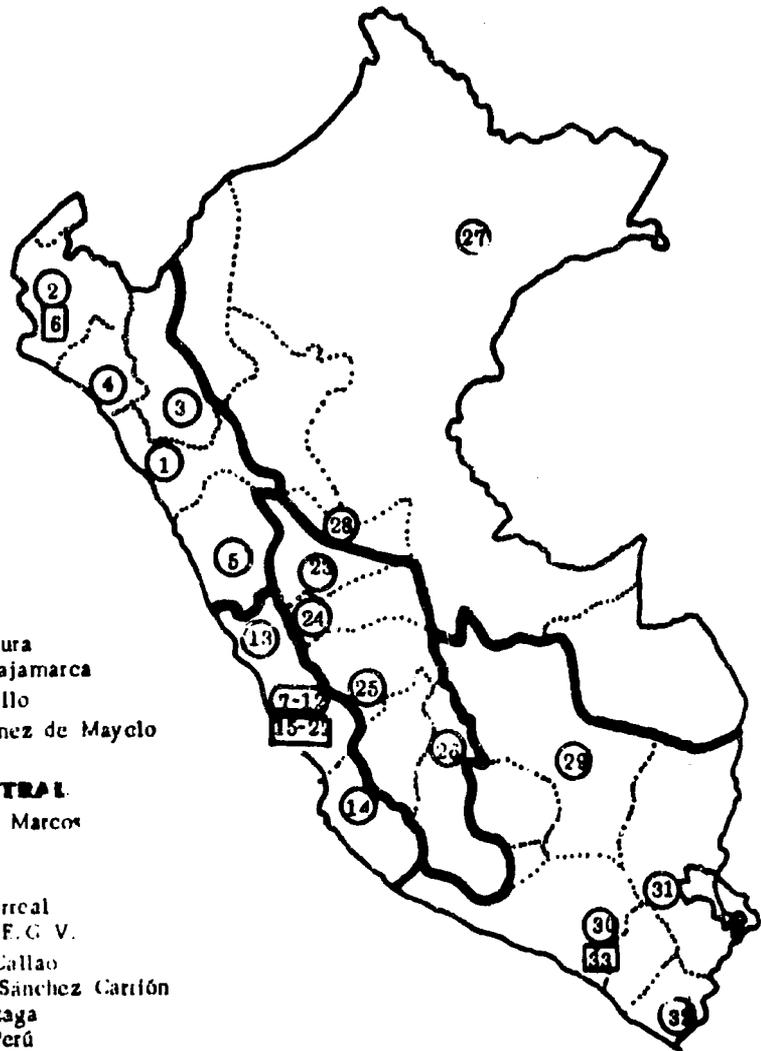
23. U. N. Hermilio Valdizán
24. U. N. Daniel Alcides Carrión
25. U. N. del Centro del Perú
28. U. N. San Cristóbal de Huamanga

REGION ORIENTE

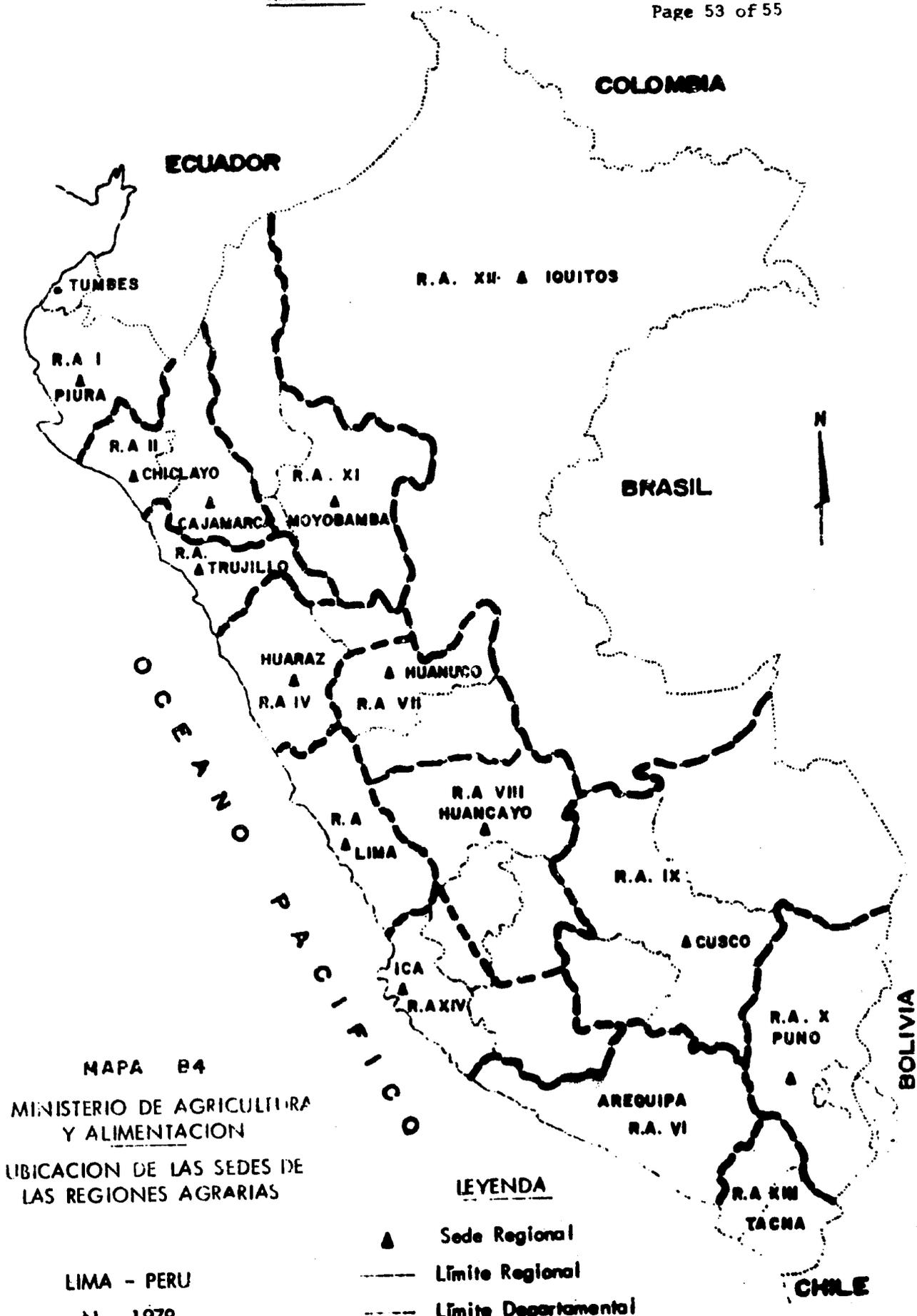
27. U. N. de la Amazonia Peruana
28. U. N. Agraria de la Selva

REGION SUR

29. U. N. de San Antonio Abad
30. U. N. de San Agustín
31. U. N. Técnica del Altiplano
32. U. N. de Tacna
33. U. P. Católica Santa María



 Universidades Estatales
 Universidades Particulares



MAPA B4
 MINISTERIO DE AGRICULTURA
 Y ALIMENTACION
 UBICACION DE LAS SEDES DE
 LAS REGIONES AGRARIAS

LIMA - PERU
 Nov. 1979

Figura 1 El Sistema de Investigación, Educación y Extensión en Servicio al Agricultor

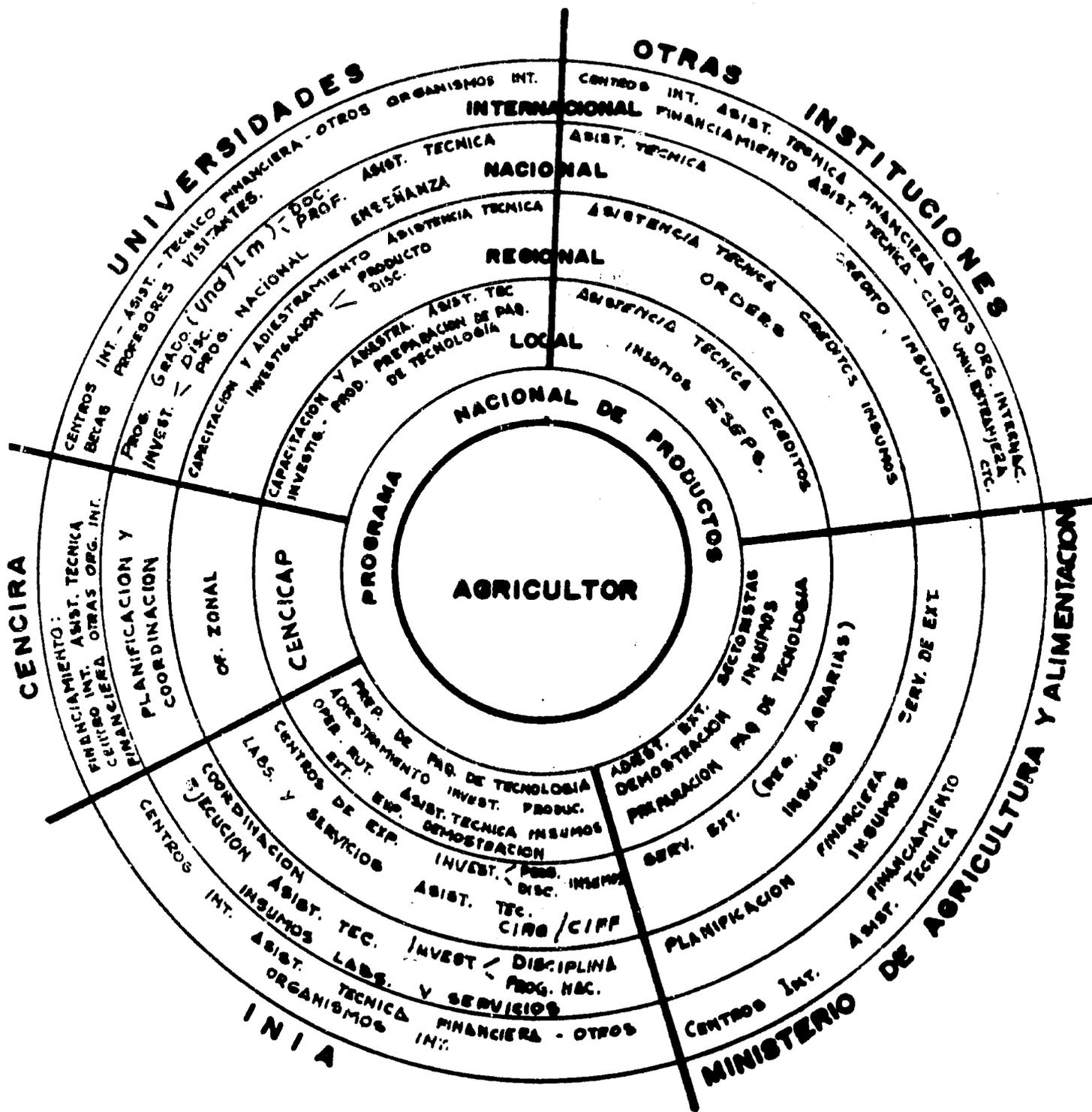
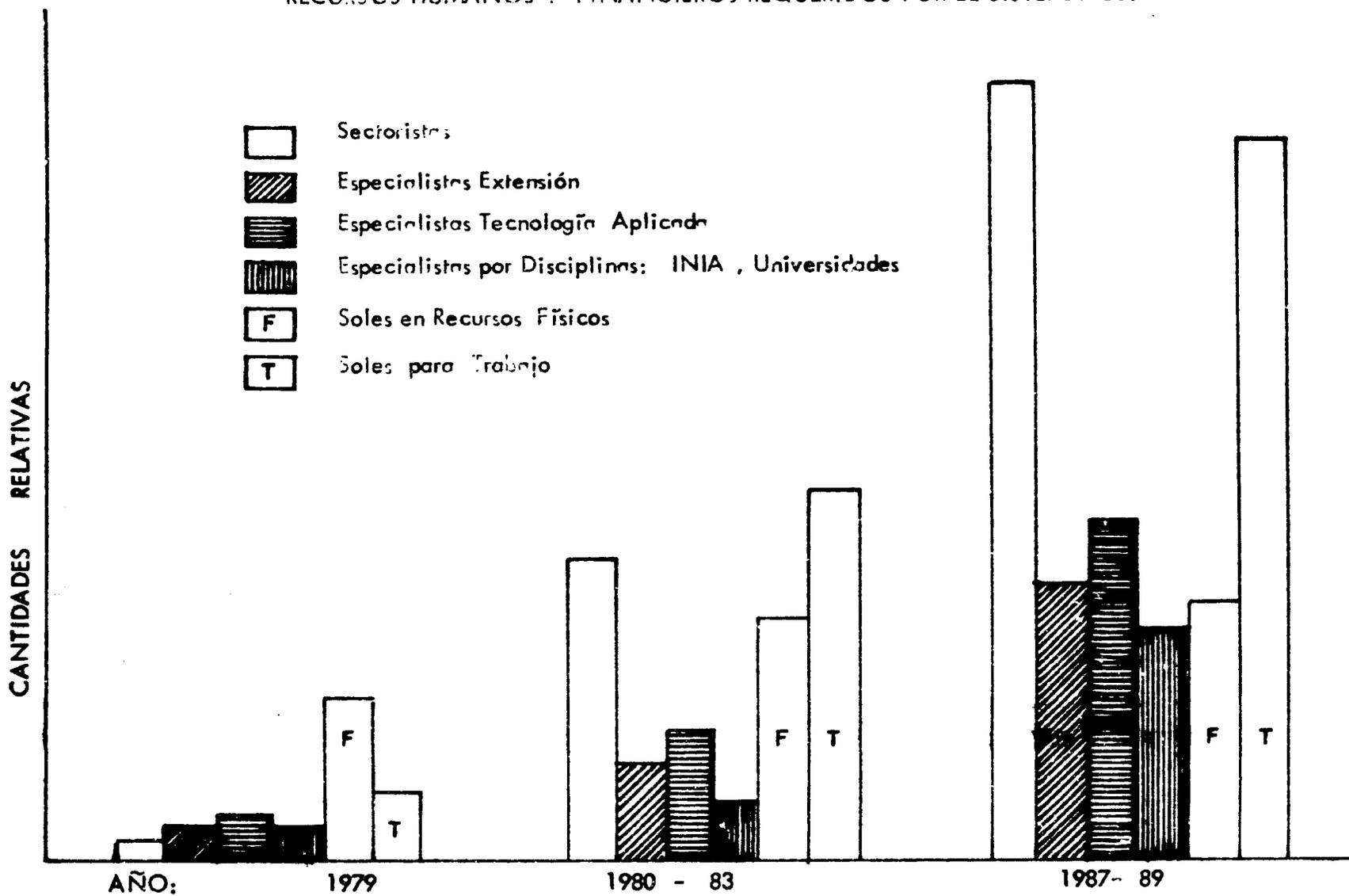
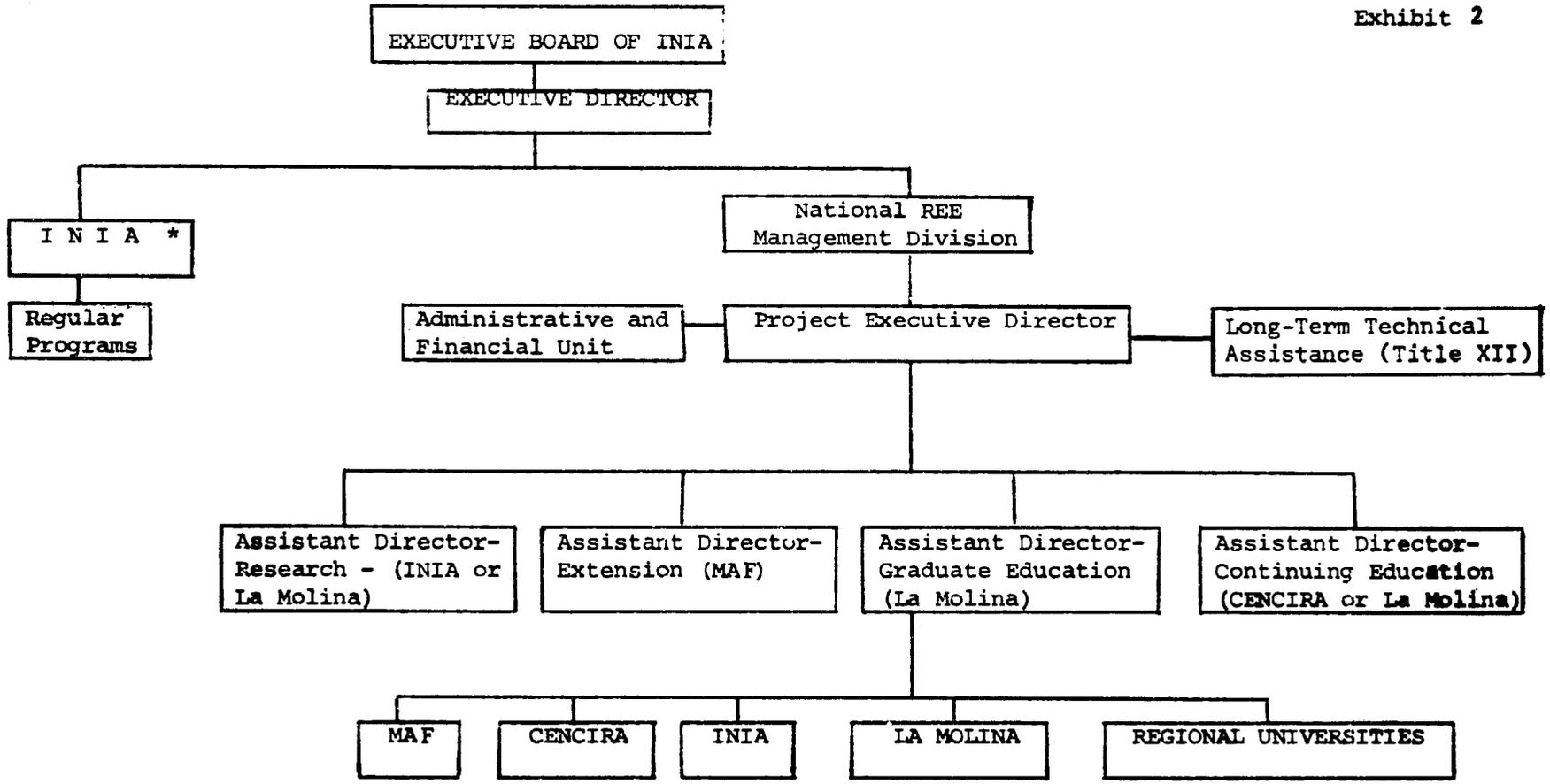


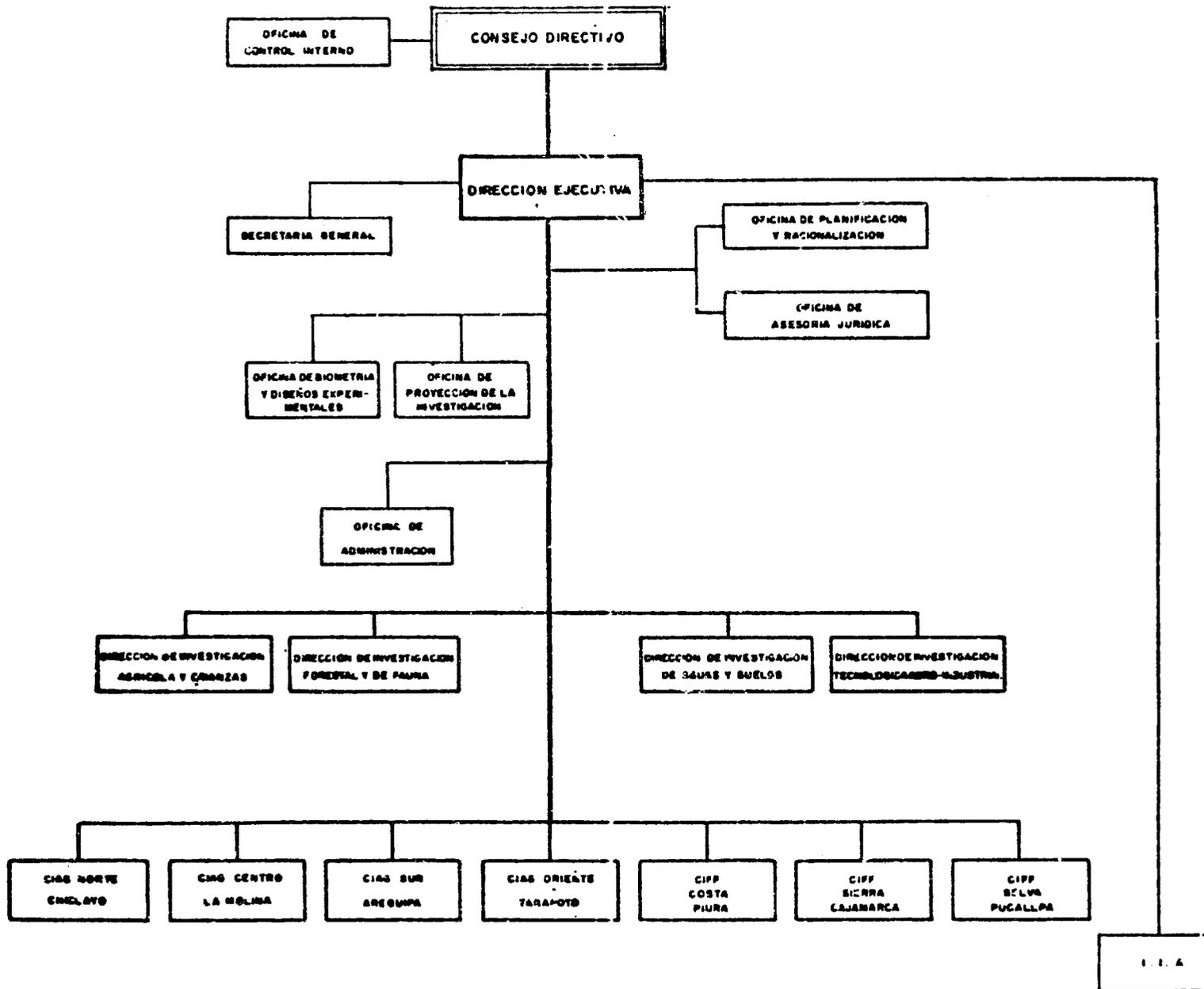
Figura 2. EL STATUS ACTUAL Y EL GRADO DE MODIFICACION E IMPLEMENTACION DE LOS RECURSOS HUMANOS Y FINANCIEROS REQUERIDOS POR EL SISTEMA IEE.



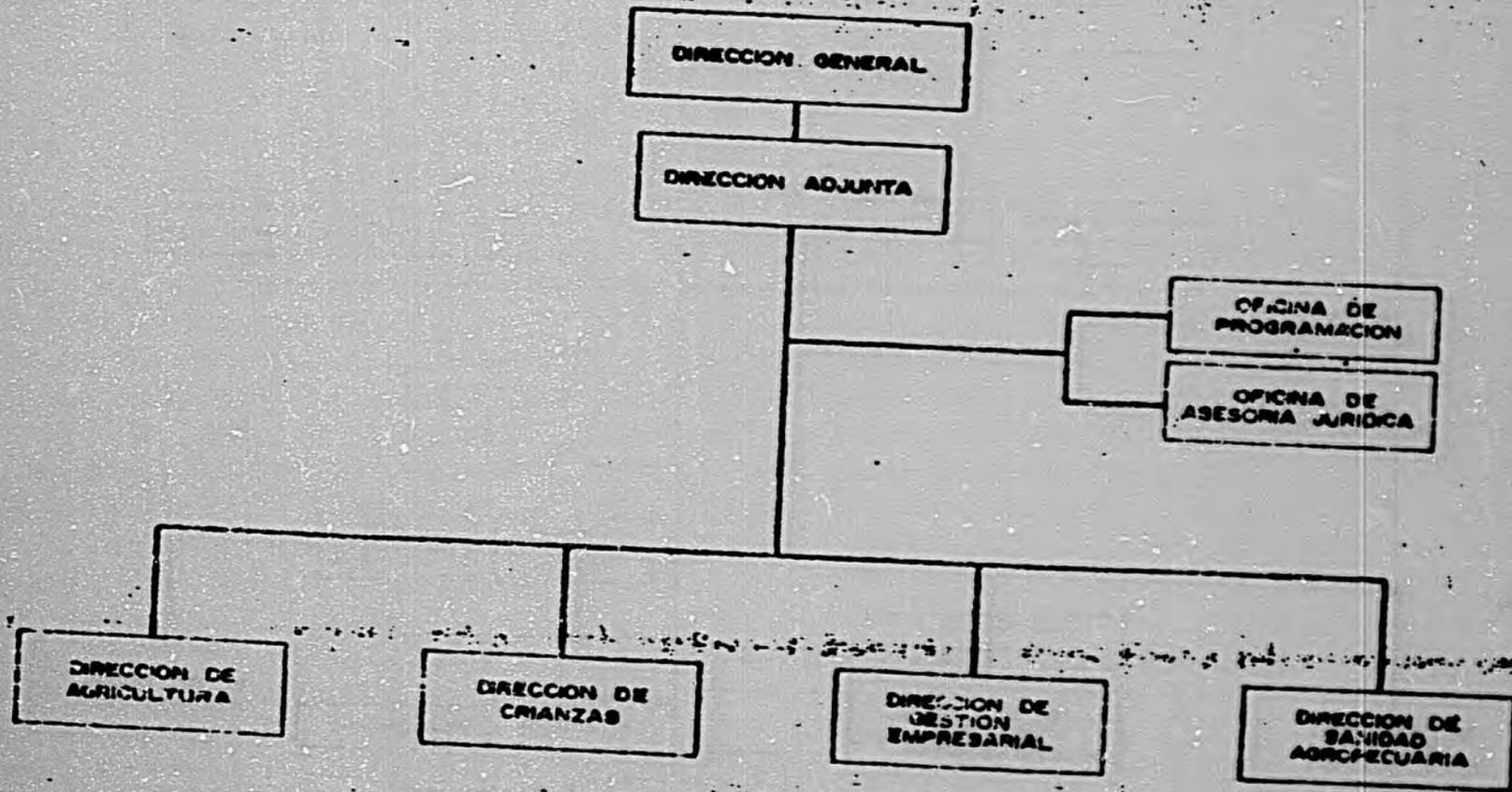


*Those programs not included in REE system.

INSTITUTO NACIONAL DE INVESTIGACION AGRARIA



ORGANIZATIONAL CHART FOR THE NATIONAL INSTITUTE FOR AGRICULTURAL RESEARCH (INIA).



DIRECCION GENERAL DE AGRICULTURA Y CRIANZAS

Summary of Other Donor Activity
Involving Agricultural Research Extension
and Education 1/

<u>Area of Activity</u>	<u>Number of Projects</u>
Irrigation Utilization	1
Wildlife Research	2
Agricultural Cooperative Training	8
Livestock Research and Extension	16
Forest Management and Utilization	6
Wheat Research	2
Rape Research	1
Soil Research and Management	2
Tea Research	1
Palm Oil Research	1
Pasture Seed Production	2
Rehabilitation of Coastal Land	3
Technical Assistance to MAF	8
Regional Development in Peru	2
Agricultural Industry Research	1
Nutrition Research and Education	4
Total	<u>60</u>

1/ Source: Baseline Study on Agricultural Research, Extension and Education subcommittee report on International technical cooperation in the National Agricultural Sector.

PROCUREMENT PLAN SUMMARY

<u>Action No.</u>	<u>Description of Goods & Services</u>	<u>Estimated Cost</u> (000)	<u>Origin (C) Source (S)</u>	<u>Contracting Mode</u>	<u>Award Basis</u>	<u>Date G & S Needed</u>	<u>Date of Solicitation</u>	<u>Date of Contract</u>	<u>Completion Date</u>	<u>USAID Financing</u>
1.	T.A. Contract	1,700	O - 000 S - 000	RFP (Title XII)	Neg. Price	9/80	5/80	7/80	8/85	100% Grant
2.	Offshore Procurement: Vehicles	688	O - 935 S - 935	IFB	Lowest Price	3/81	7/80	9/80	3/82	100% Loan
3.	Offshore Procurement: Equipment	659	O - 941 S - 941	IFB	Lowest Price	87 4 -4/81 13 4 -4/82	9/80	11/80	11/81	100% Loan
4.	Facility Improvement	260	O - HC S - HC	RFP	Neg. Price	92 4 -4/81 8 4 -4/82	10/80	12/80	10/82	100% Loan
5.	Foreign Training	480	O - 000 S - 000	RFP	Neg. Price	11/80	7/80	9/80	8/85	40% Grant 60% Loan
6.	In-Country Training	1,490	O - HC S - HC	RFP	Neg. Price	11/80	7/80	9/80	8/85	100% Loan

Equipment List

<u>Item No.</u>	<u>Qty.</u>	<u>Description</u>	<u>Unit Price</u>	<u>Total</u>
1	64	Trucks	\$10,000	\$640,000
2	60	Motorcycles	800	48,000
3	120	Plot thresers	600	72,000
4	20	Shellers	2,000	40,000
5	24	Small Tractors with implements	3,000	72,000
6	25	Pumps	800	20,000
7	200	Hand Sprayers	50	10,000
8		Hand Tools		6,000
9		Spare Parts & Misc. (Extension)		26,000
10	20	Cameras	200	4,000
11	30	Slide Projectors	150	3,000
12	25	Tape Recorders	40	1,000
13	30	Screens	33	1,000
14	25	Speakers	200	5,000
16	20	Film Projectors	350	7,000
17	25	Mimeograph Machines	360	9,000
18	25	Water Distillers	150	3,750
19	25	Balances	50	1,250
20	25	Sample drying Stoves	180	4,500
21	11	Refrigerators	150	1,650
22	11	Potentiometers	200	2,200
23	8	Centrifuges	250	2,000
24	32	Microscopes	200	6,400
25	35	Calculators	150	22,500
26	15	Sterilizers	200	3,000
27	10	Kiheldhal Nitrogen Units	900	9,000
28	20	Colorimeters	1,000	20,000
29	25	Tray Shakers	100	2,500
30	25	Deionizers	250	6,250
31	1	Gas chromatograph	40,000	40,000
32	12	UV Absorption Units	800	5,600
33	125	Soil Sampling Kits	20	2,500
34		Glassware		10,000
35		Reagents		20,000
36	5	Tractors with implements	30,000	150,000
37	12	Soil Water Tension Units	200	2,400
38	10	Audiovisual Units	1,200	12,000
39		Misc. Lab equipment		30,000
40		Misc. Spare Parts		25,500
			Grand Total	\$1,347,000

Note: Equipment list specifications to be refined through grant funded technical assistance to be provided for this purpose.