

CLASSIFICATION
PROJECT EVALUATION SUMMARY (PES) - PART I

Report Symbol U-447

1. PROJECT TITLE Research, Extension and Education (REE)	2. PROJECT NUMBER 527-0192	3. MISSION/AID/W OFFICE Peru
4. EVALUATION NUMBER (Enter the number maintained by the reporting unit e.g., Country or AID/W Administrative Code, Fiscal Year, Serial No. beginning with No. 1 each FY) <u>84-07</u>		
<input checked="" type="checkbox"/> REGULAR EVALUATION <input type="checkbox"/> SPECIAL EVALUATION		

5. KEY PROJECT IMPLEMENTATION DATES	6. ESTIMATED PROJECT FUNDING	7. PERIOD COVERED BY EVALUATION									
<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">A. First PRO-AG or Equivalent FY <u>80</u></td> <td style="width: 33%;">B. Final Obligation Expected FY <u>85</u></td> <td style="width: 33%;">C. Final Input Delivery FY _____</td> </tr> </table>	A. First PRO-AG or Equivalent FY <u>80</u>	B. Final Obligation Expected FY <u>85</u>	C. Final Input Delivery FY _____	<table style="width: 100%; border: none;"> <tr> <td style="width: 50%;">A. Total \$ <u>15,000,000</u></td> <td style="width: 50%;">B. U.S. \$ <u>11,000,000</u></td> </tr> </table>	A. Total \$ <u>15,000,000</u>	B. U.S. \$ <u>11,000,000</u>	<table style="width: 100%; border: none;"> <tr> <td style="width: 60%;">From (month/yr.) <u>08/80</u></td> <td style="width: 40%;">To (month/yr.) <u>12/83</u></td> </tr> <tr> <td colspan="2">Date of Evaluation Review <u>3/26/84</u></td> </tr> </table>	From (month/yr.) <u>08/80</u>	To (month/yr.) <u>12/83</u>	Date of Evaluation Review <u>3/26/84</u>	
A. First PRO-AG or Equivalent FY <u>80</u>	B. Final Obligation Expected FY <u>85</u>	C. Final Input Delivery FY _____									
A. Total \$ <u>15,000,000</u>	B. U.S. \$ <u>11,000,000</u>										
From (month/yr.) <u>08/80</u>	To (month/yr.) <u>12/83</u>										
Date of Evaluation Review <u>3/26/84</u>											

8. ACTION DECISIONS APPROVED BY MISSION OR AID/W OFFICE DIRECTOR

A. List decisions and/or unresolved issues; cite those items needing further study. (NOTE: Mission decisions which anticipate AID/W or regional office action should specify type of document, e.g., airgram, SPAR, PIO, which will present detailed request.)	B. NAME OF OFFICER RESPONSIBLE FOR ACTION	C. DATE ACTION TO BE COMPLETED
--	---	--------------------------------

Project Background

The Research, Extension and Education (REE) Project No. 527-0192 was developed in 1979-80 and the Project Agreement signed in August 1980. The project purpose is to create an agricultural research, extension, and education system that will enable institutions involved in REE to (a) increase agricultural production by structuring the basis for enhancing and reinforcing the human resources required for agricultural research, extension and education, and (b) provide for a continued flow of varying levels of agricultural technology which meets the needs of small and medium-sized farmers, as well as those of the associative enterprises.

Implementation of the project was delayed until January 22, 1982, when a contract for technical assistance was signed with North Carolina State University (NCSU).

Several unanticipated and unrelated factors, including the creation of the National Institute of Agricultural Research and Extension (INIPA) through the merger of various extension organizations; the adoption of the training and visit extension methodology by INIPA; the financing of major, new REE projects by the BID and IBRD; and a series of natural disasters, affected AID's REE project. Research and extension were integrated into the

9. INVENTORY OF DOCUMENTS TO BE REVISED PER ABOVE DECISIONS	10. ALTERNATIVE DECISIONS ON FUTURE OF PROJECT																
<table style="width: 100%; border: none;"> <tr> <td><input type="checkbox"/> Project Paper</td> <td><input checked="" type="checkbox"/> Implementation Plan e.g., CPI Network</td> <td><input type="checkbox"/> Other (Specify) _____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Financial Plan</td> <td><input type="checkbox"/> PIO/T</td> <td>_____</td> </tr> <tr> <td><input type="checkbox"/> Logical Framework</td> <td><input type="checkbox"/> PIO/C</td> <td><input type="checkbox"/> Other (Specify) _____</td> </tr> <tr> <td><input checked="" type="checkbox"/> Project Agreement</td> <td><input type="checkbox"/> PIO/P</td> <td>_____</td> </tr> </table>	<input type="checkbox"/> Project Paper	<input checked="" type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify) _____	<input checked="" type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	_____	<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____	<input checked="" type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____	<table style="width: 100%; border: none;"> <tr> <td style="width: 33%;">A. <input type="checkbox"/> Continue Project Without Change</td> </tr> <tr> <td>B. <input type="checkbox"/> Change Project Design and/or</td> </tr> <tr> <td style="padding-left: 20px;"><input checked="" type="checkbox"/> Change Implementation Plan</td> </tr> <tr> <td>C. <input type="checkbox"/> Discontinue Project</td> </tr> </table>	A. <input type="checkbox"/> Continue Project Without Change	B. <input type="checkbox"/> Change Project Design and/or	<input checked="" type="checkbox"/> Change Implementation Plan	C. <input type="checkbox"/> Discontinue Project
<input type="checkbox"/> Project Paper	<input checked="" type="checkbox"/> Implementation Plan e.g., CPI Network	<input type="checkbox"/> Other (Specify) _____															
<input checked="" type="checkbox"/> Financial Plan	<input type="checkbox"/> PIO/T	_____															
<input type="checkbox"/> Logical Framework	<input type="checkbox"/> PIO/C	<input type="checkbox"/> Other (Specify) _____															
<input checked="" type="checkbox"/> Project Agreement	<input type="checkbox"/> PIO/P	_____															
A. <input type="checkbox"/> Continue Project Without Change																	
B. <input type="checkbox"/> Change Project Design and/or																	
<input checked="" type="checkbox"/> Change Implementation Plan																	
C. <input type="checkbox"/> Discontinue Project																	

11. PROJECT OFFICER AND HOST COUNTRY OR OTHER RANKING PARTICIPANTS AS APPROPRIATE (Names and Titles)	12. Mission/AID/W Office Director Approval			
Timothy Miller Project Manager	<table style="width: 100%; border: none;"> <tr> <td style="border-bottom: 1px solid black;">Signature <i>John Sanbrailo</i></td> </tr> <tr> <td style="border-bottom: 1px solid black;">Typed Name John A. Sanbrailo</td> </tr> <tr> <td style="border-bottom: 1px solid black;">Date 5/14/84</td> </tr> </table>	Signature <i>John Sanbrailo</i>	Typed Name John A. Sanbrailo	Date 5/14/84
Signature <i>John Sanbrailo</i>				
Typed Name John A. Sanbrailo				
Date 5/14/84				

(Continuation sheet)

8.A. project; the National Research Support Unit was not implemented; the Education Program received less emphasis than originally planned; Special National Programs were added; and the project was delayed almost one year while NCSU assisted INIPA in developing its nationwide Integral REE Program.

Evaluation Findings

A mid-term evaluation of the REE Project was carried out between January 7 and February 4, 1984 by a five-person team, selected with assistance from BIFAD and contracted by Experience, Incorporated. The team concluded that the project was progressing toward achievement of the project purpose and end-of-project status at a good rate.

1. Project Achievements

- a) The project has provided the conceptual basis and technical assistance (from NCSU) which INIPA has used to develop its nationwide Integral REE Program of \$121.0 million. (This was not in the PP).
- b) Project outputs are beginning to come on stream after only one year of project implementation.
 - (1) Eighteen CIPAs are organized.
 - (2) Eight regional and three central service laboratories are being developed.
 - (3) Five NPPs have been organized and are functioning.
 - (4) Five RRCs are in place.
 - (5) Farmers are adopting new technologies.
 - (6) Research and extension management and coordination has improved.
 - (7) UNA faculty and students are participating in research at some CIPAs.
 - (8) Training has taken place.
 - (9) Increased collaboration between AID, BID and IBRD is helping INIPA and UNA with their Integral REE Program.

2. Project weaknesses

- a) The institutions in the REE system need greater and more sustained GOP support, including timely and adequate counterpart funds, increased salaries for professionals in agriculture, and autonomy from political manipulation.

- b) Management and administration are major constraints to more effective research, extension and education programs.
- c) The education program is not sufficiently integrated into the system and an Education Advisor has never been hired.
- d) Roles and goals are not adequately defined.

3. Evaluation Recommendations

The evaluation team made a series of recommendations, as summarized in pages 4-11 or discussed at length in pp. 74-96 of their final report.

The two major recommendations are to:

- a) Extend the first phase of the project by two years.
- b) Begin preliminary planning for a second phase.

4. Post-Evaluation Actions

After the evaluation was completed, the Project Committee members in USAID held a meeting to review the recommendations contained in the report and discuss their implementation. It was decided that Annex I of the Project Agreement, the LOP Financial Plan, and the LOP Implementation Plan should be revised.

MID-TERM EVALUATION OF THE USAID
RESEARCH, EXTENSION AND EDUCATION
PROJECT IN PERU
(USAID Project No. 527-0192)

by

Morris D. Whitaker, Team Leader
Dan C. Galvan, Extension Specialist
David W. James, Research Specialist
George W. Norton, Agricultural Economist
Jose Valle-Riestra, Research Management Specialist

for

Experience, Incorporated; and USAID*

March 2, 1984

Logan, Utah

* Completed under AID Contract Number PDC-1406-I-24-1142-00, with Experience, Incorporated.

TABLE OF CONTENTS

	<u>Page</u>
PREFACE AND ACKNOWLEDGEMENTS	iii
KEY TO ACRONYMS	vi
I. EXECUTIVE SUMMARY	
A. Introduction	1
B. Project History	2
C. Major Conclusions	2
D. Principal Recommendations	4
II. PROJECT BACKGROUND	
A. Project History	12
B. Description of the Proposed Project	13
C. Unforeseen Factors Affecting the Project	16
D. Subsequent Changes in the Project	19
E. The Economic and Social Environment and its Effect on the Project	24
III. PROGRESS TOWARD PROJECT PURPOSE	
A. Introduction	28
B. Description of the Integrated REE Project	29
C. AID REE Project Inputs	31
D. Research and Extension	38
E. The Education Program, and Training in Support of Research and Extension	55
F. National REE Management/Administration	60
G. New Project Elements	69
IV. CONCLUSIONS AND RECOMMENDATIONS	
A. Project Viability and Appropriateness	74
B. Research	78
C. Extension	83
D. Education, Training and Human Capital	86
E. Administration and Management of the REE	90
F. Institutional Performance	92
G. INIPA's Growth and Development	94
V. APPENDICES	
A. Scope of Work and Logical Framework	99
B. Evaluation Methodology	111
C. Data on Integral REE Program	120
D. Schedule of Technical Assistance	131
E. Thesis Topics: REE <u>Becarios</u> at UNA	136
F. Evaluation Team: <u>Resumes</u>	140
G. Newspaper Article: National Service Laboratories	143
H. Feasibility of Agricultural Research System Review for Peru	145
VI. LIST OF LITERATURE REVIEWED	149

PREFACE AND ACKNOWLEDGEMENTS

This is the final evaluation report of the mid-term evaluation of the U.S. Agency for International Development's Research, Extension, and Education project (no. 527-0192) in Peru. The evaluation -- carried out in Peru between January 7 - February 3, 1984 -- was done by a five person team comprised of Drs. Morris D. Whitaker, Team Leader; Dan C. Galvan, Extension Specialist; David W. James, Research Specialist; George W. Norton, Agricultural Economist; and Jose Valle-Riestra, Research Management Specialist. The evaluation was carried out by Experience, Incorporated, under an IQC contract with AID and under auspices of the BIFAD which had recommended the team members to AID, and Experience, Incorporated.

The evaluation was carried out in full collaboration with AID, INIPA, and NCSU. The terms of reference and associated work plan which had been developed jointly by them were modified slightly after the team arrived to accomodate more division of labor among team members in visiting various project field sites and in writing the draft report. Preliminary versions of various chapters of the draft report were shared (with AID permission) with key people from INIPA and NCSU, and a preliminary report was made to the Minister of Agriculture at the mid-point and a final report at the end of the evaluation. Comments from these people were incorporated into the draft report which was left with the mission, and comments were invited from INIPA, NCSU, and AID on the draft report for consideration in preparing the final report. Extensive written comments on the draft have been received from 11 different people in AID, INIPA, and NCSU. These comments were very helpful in improving the report by correcting errors of fact and interpretation, and providing new, complementary data.

The report still likely contains errors of fact, judgement and probably omissions, and any such errors are obviously the responsibility of the team, and should not be ascribed to those who provided critical comments. There are clearly many individuals closely associated with the project, who have much greater in-depth knowledge of and insights about various aspects of the project than any of us could expect to obtain in only one month. These are the people most likely to discover remaining errors. We would ask these readers to consider that the value of our contribution lies in our comprehensive perspective, our disciplinary/problem focus, our background experiences in development, and our lack of vested interest in any programmatic changes associated with the evaluation. Hopefully, the utility of this approach will more than compensate for any remaining errors.

The final report represents a consensus of opinion among team members regarding the conclusions and recommendations. The team was remarkably united in its interpretation of the data we examined and reached a unanimous viewpoint regarding the success of the project and problems constraining progress. Consequently, no minority report was necessary.

One element of the scope of work -- a revised recommended implementation plan for the remainder of the project -- was deleted by the AID liaison officer for the evaluation, Mr. David Bathrick, in consultation with the project manager, Mr. Timothy Miller, and the Team Leader, Dr. Morris D. Whitaker and other team members. There were three reasons for dropping the requirement of an implementation plan from the scope of work. First, the recommendations of the evaluation report for an extension of the project, for additional technical assistance, and for participant training required some decisions on AID's part before a meaningful revised implementation plan could be developed. In short, the parameters needed to be clearly set before such an undertaking, and AID was not in a position to make these decisions prior to completion of the evaluation. Second, INIPA's Operative Plan for 1984 was not yet ready while the team was in Peru (and is still not available as of the date of this report). The Operative Plan for 1984 is an implementation plan, which, when ready, can be reviewed in light of this evaluation and appropriately modified. This, however, also will require AID to set parameters for the project based on this evaluation. (The Operative Plan for 1984 is for the Integral REE program which combines AID, BID, World Bank and other donor financing. One problem in developing a revised implementation plan for AID is disaggregating the AID financial components from INIPA's donor program.) Third and finally, the scope of work was overly ambitious for the time allowed and trade offs had to be made regarding the completion of other elements of the scope of work. Given reasons number 1 and 2, the decision was made to drop the revised implementation plan.

The team collectively and individually are in debt to several institutions and a large number of people for their support and assistance to us while carrying out this evaluation. Principal institutions which provided direct support and assistance to this effort include Experience, Incorporated, INIPA, AID, NCSU, and CIP in Peru, and NCSU and AID/W in the United States. We also recognize the support of our home institutions -- Utah State University, CIP, Texas A&M, and Virginia Tech. The team expresses our appreciation for the time extended to us on two separate occasions by Mr. Juan Carlos Hurtado Miller, Minister of Agriculture and Food and for his personal interest in the evaluation. The team also is especially grateful to Mssrs. John Sanbrailo, David Bathrick and Tim Miller, USAID, Drs. Victor Palma and Alfredo Montes, INIPA, and Drs. Lawrence Apple, Arthur Coutu, and Dale Bandy, NCSU, for their careful, thoughtful preparation of the scope of work, itinerary, and logistic support throughout this evaluation. These people and their staffs were clearly well prepared and went the extra mile in assisting us and helping us throughout the evaluation. The special effort of Miss Monica Ezeta, who worked many extra hours to prepare the draft before our deadline is a fine example of this. Special thanks are also due to Dr. Richard Saywer of CIP who not only released his Deputy (Jose Valle-Riestra) to serve on this team, but provided other logistic support during the evaluation. Finally, we would like to thank the many other Peruvian, AID, and NCSU colleagues who were supportive and helpful to us during our stay in Peru. While we refrain from mentioning

them by name for fear of leaving someone out, we are most appreciative of the very professional way in which our site visits and interviews were prepared and executed, and for the many courtesies and kindnesses which were extended to us. We truly appreciated the warm, cordial reception we were accorded throughout our visit, and hope to have an early opportunity to reciprocate.

Morris D. Whitaker
Logan, Utah
March 2, 1983
for the evaluation team

KEY TO ACRONYMS

- AID : U.S. Agency for International Development Mission in Lima, Peru.
- AID/W : AID Washington.
- APID : Agricultural Planning and Institutional Development. AID project of \$17.0 million with five major components approved in August 1983.
- BID : Banco Interamericano de Desarrollo. Interamerican Development Bank.
- CATIE : Centro Agronomico Tropical de Investigacion y Ensenanza. Tropical Agriculture Center for Research and Teaching. Turrialba; Costa Rica.
- CENCIRA : Centro Nacional de Capacitacion e Investigacion para La Reforma Agraria. National Center for Training and Research for Agrarian Reform.
- CESPAC : Center for Audio-Visual Training. Centro de Servicios de Pedagogia Audiovisual para la Capacitacion.
- CIAT : Centro Internacional de Agricultura Tropical. International Center of Tropical Agriculture. Cali, Colombia.
- CIMMYT : Centro Internacional de Mejoramiento de Maiz y Trigo. International Center for Maize and Wheat Improvement. El Batan, Mexico.
- CINAF : Institute for the Expansion of the Agricultural Frontier.
- CIP : Centro Internacional de la Papa. International Potato Center. La Molina, Lima, Peru.
- CIPA : Centro de Investigacion y Promocion Agraria (INIPA). Center for Agricultural Research and Extension.
- DID : Department of Irrigation and Drainage (MAF). Departamento de Riegos y Drenaje.
- DEIA : Direccion Ejecutiva de Investigacion Agropecuaria (INIPA). Executive Directorate for Agricultural Research.
- DGASI : Department of Water, Soils, and Irrigation (MAF).
- ECASA : Empresa Comercializadora de Arroz, S.A. (GOP). Rice Marketing Enterprise.

- ENTEL : National Telecommunications Study. Empresa Nacional de Telecomunicaciones del Peru, S.A.
- ESAN : Graduate School of Business Administration. Educacion Superior de Administracion y Negocios.
- GOP : Government of Peru.
- IARC's : International Agricultural Research Centers. Centros Internacionales de Investigacion Agricola.
- ICRAF : International Council for Research in Agro-forestry. Consejo Internacional para la Investigacion Agro-forestal. Nairobi, Kenya.
- IDB : See BID.
- IEE : Proyecto de Investigacion, Extension y Educacion (INIPA-AID). See REE.
- IIAP : Instituto de Investgaciones de la Amazonia Peruana, Iquitos.
Institute of Research of the Peruvian Amazon.
- INDDA : Instituto Nacional de Desarrollo Agroindustrial. National Center for Agroindustrial Development.
- INIA : Instituto Nacional de Investigacion Agropecuaria (MAF research agency joined with NES, CENCIRA, and CENAMA in 1980 to create INIPA). National Institute of Agricultural Research.
- INIPA : Instituto Nacional de Investigacion y Promocion Agraria. National Institute of Agricultural Research and Extension.
- INFOR : Instituto Nacional de Forestal y Fauna. National Institute of Forestry and Fauna.
- IVITA : Instituto Veterinario de Investigacion de Tropico y Altura. Veterinary Research Institute for the Tropics and High Altitudes. Univ. de San Marcos (Lima, Pucallpa, Huancayo).
- MAF : Ministry of Agriculture and Food. Ministerio de Agricultura y Alimentacion.
- MEF : Ministerio de Economia, Finanzas y Comercio. Ministry of Finance and Commerce.
- NCSU : North Carolina State University. Universidad de Carolina del Norte.
- NES : National Extension Service (Refers to the several extension-related units of MAF that were joined with INIA in 1980,

along with CENCIRA and SENAMA that were to create INIPA).
Servicio Nacional de Extension.

- NP : National Programs (INIPA). Successor term to NPP now used by INIPA. Programas Nacionales.
- NPP : National Production Programs (INIPA). Programas Nacionales de Produccion.
- OA : Oficina de Administracion (INIPA). Administration Office.
- OCT : Oficina de Capacitacion Tecnica (INIPA). Training Office.
- ONERN : National Office for the Evaluation of Natural Resources. Oficina Nacional de Evaluacion de Recursos Naturales.
- OP : Oficina de Planificacion (INIPA). Planning Office.
- PAP : Presupuesto Analitico de Personal (INIPA). Personnel Analytical Budget.
- PEPP : Proyecto Especial Pichis Palcazu. Special project "Pichis Palcaza."
- PP : Project Paper. Documento Descriptivo del Proyecto (USAID).
- PSA : Programa Sectorial Agropecuario (BID). Agricultural Sectoral Program.
- PTTSM : Proyecto de Transferencia de Tecnologia y Semilla Mejorada (BID). Improved Seed and Technology Transfer Project.
- Pliego : Top priority budget line item of Peruvian Government.
- REDINAA : Red de Investigacion Agraria para la Amazonia. Amazonian Agricultural Research Network (six nations).
- REE : Research Education and Extension Project (INIPA - AID). See IEE.
- RFTP : Request for technical proposals (AID).
- RRCs : Regional Research Centers (REE).
- RSLs : Regional Service Laboratories.
- SENAMA : National Service for Agricultural Machinery. Servicio Nacional de Maquinaria Agricola (INIPA).
- SMR-CRSP : Small Ruminants CRSP (University of California, Davis--AID/W). Proyecto de Pequeños Rumiantes.

- Tahal : Israeli consultant group working on extension in INIPA.
Consultores Israelis en Extension.
- TROPSOILS-
CRSP : NCSU Tropical Soils Program - Yurimaguas. Programa de Suelos
Tropicales - Yurimaguas.
- T & V : Training and Visit (an extension philosophy/methodology)
often utilized in World Bank projects.
- UNA : Universidad Nacional Agraria - La Molina. National Agrarian
University.
- UNAP : Universidad Nacional de la Amazonia Peruana - Iquitos.
National University of the Peruvian Amazon.
- UNAS : Universidad Nacional de la Selva, Tingo Maria. National
University of the Jungle.
- UNPRG : Universidad Nacional Pedro Ruiz Gallo.
- USAID : See AID.

I. EXECUTIVE SUMMARY

A. Introduction

This report contains an outside evaluation of the U.S. Agency for International Development/Peru (AID) Research, Extension and Education (REE) Project No. 527-0192. The evaluation was carried out in Peru during January 7 through February 3, 1984 by a five-person team working under an AID indefinite quantity contract with Experience, Incorporated.¹

The purpose of the AID 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; and (b) provide for a continued flow of varying levels of agricultural technology which meet the needs of small and medium-sized farmers, as well as those of the associative enterprises.²

The project is the first phase of a longer term effort to strengthen Peru's REE system according to AID's project paper.³

The project outputs were to be the formation of: (1) five National Production Programs (NPPs) for corn, rice, potatoes, small grains (wheat and barley), and grain legumes (edible beans); (2) six Regional Service Laboratories (RSLs); (3) five Regional Research Centers (RRCs); (4) a National Research Support Unit; (5) an Education Program; and (6) a National REE Management Division.

The principal inputs to be provided by the project were: (1) technical assistance from a U.S. Title XII (agricultural) university; (2) selected operational support costs; (3) salary supplements; (4) training; and (5) vehicles and equipment.⁴

The purpose of the evaluation is:

... to obtain an assessment of the appropriateness of the basic project design, the effectiveness of project activities particularly technical assistance in carrying out project objectives, the progress achieved by INIPA in developing the capability to carry out its functions, and the identification of the principal problems and constraints impeding achievement of project success and alternative solutions to the problems identified.⁵

B. Project History

The project was approved by AID in March 1980 and the project agreement signed in August 1980 with an implementation target of October 1980. However, the project was not implemented until January 22, 1982, when AID signed a technical assistance contract with North Carolina State University (NCSU), a delay of 15 months. The delay was due principally to (1) the organization of National Institute of Agricultural Research and Extension (INIPA) from various extension organizations (NES, CENCIRA, and SENAMA) and the National Institute of Agricultural Research (INIA) (formalized in March 1980); and (2) AID's unusually slow procurement process (the request for technical proposals (RFTP) was not issued until July 1981 and NCSU was not selected until late November 1981); and (3) delays in Government of Peru (GOP) compliance with some of the conditions precedent (the last of which was finally met in April 1983).

Several unrelated factors not anticipated in the project paper each have had a major impact on the project. Included are: (1) the creation of INIPA with the merger of INIA, the NES, CENCIRA, and SENAMA; (2) the changes in INIPA's leadership; (3) adoption of the Training and Visit (T & V) extension methodology by INIPA; (4) new major, complementary REE projects financed by the Interamerican Development Bank (IDB) and the World Bank; and (5) bad weather in 1983 with drought in the Southern and Central Sierra and floods in the Northern Coast.

These factors have affected the project in a variety of ways including: (1) development of a nationwide INIPA REE effort with AID, IDB and World Bank funding (referred to hereafter as INIPA's Integral REE Program to distinguish it from AID's much smaller but seminal project); (2) utilization of the conceptual approach and most of the elements of USAID's project in INIPA's Integral REE Program; (3) substantial linkages between INIPA and the International Agricultural Research Centers; (4) some modifications and changes in the elements of USAID's project such as integration of research and extension at Centers of Research and Extension (CIPA's); no National Research Support Unit, or National Management Unit; reduced emphasis on the Education Program; the addition of special National Programs (NPs) for the Selva, Sierra, and Agricultural Economics;⁶ and (5) a delay of almost one year (to late 1982) in implementing the elements of AID's project while NCSU assisted INIPA to develop its Integral REE Program.

C. Major Conclusions

The AID Research, Extension and Education Project (No. 527-0192) is making good progress toward and the achievement of the project purpose and end-of-project status. There have been two major achievements--the first not programmed in the project paper and the second in conformance with project objectives. First, the project has provided the conceptual basis and technical assistance (from NCSU) which INIPA has used to

develop its nationwide, Integral REE Program of \$121.0 million--far beyond the \$15.0 million in the AID project. Second, project outputs are beginning to come on stream, even though the Integral Program has been under implementation only for about one year.

Project accomplishments and outputs which are clearly emerging or are in place include: (1) eighteen CIPAs that integrate research and extension functions, organized at sites roughly corresponding to department boundaries; (2) eight Regional and three Central Service Laboratories (RSLs) in process of being developed as a NP at selected CIPAs with new equipment provided by the project already on hand and buildings designated (see Appendix G); (3) five NPPs organized and functioning with headquarters at five CIPAs, elements at most other CIPAs, functional linkages to the relevant IARCs and CRSPs, and special backstopping from CIP; (4) five RRCs in place at the principal experiment stations in each of the CIPAs which are headquarters of the NPPs; (5) clear evidence that farmers are beginning to adopt improved technologies as a direct result of the NPPs and that researchers are working on constraints identified through the NPPs; (6) especially good progress in NPPs for potatoes, rice, and corn; with cooperating farmers now growing foundation seed, and some certified seed; (7) improved coordination and management of research and extension and clear evidence of a unity of purpose and esprit de corps among INIPA staff, both at headquarters and in the field; (8) participation of faculty and students at National Agrarian University (UNA) in research at some CIPAs as part of the RRCs and NPPs and long-term training and salary supplements for UNA faculty; (9) a relatively large number of people in long-term training and a significant level of long and short-term training that has been held or is programmed to begin shortly to support the research and extension elements of USAID's project; (10) three additional NPs with a broader systems approach which have been planned and are about to be implemented (the Sierra, Selva, and Agroecconomics Programs); (11) two other AID projects--Agricultural Policy and Institutional Development (APID), and Plan MERIS, which are complementary to AID's REE project, and which directly address weaknesses identified in this evaluation; (12) the integrative and management role the IARCs have played with NCSU assistance in the successes of the NPPs and management of INIPA's Integral REE Program; and, (13) very effective assistance and support from AID and NCSU in collaboration with BID, and the World Bank in helping INIPA and UNA to conceptualize, develop and implement the REE project and INIPA's Integral REE Program.

The principal problems which constrain the development of a more effective REE system and increased use of improved technologies in Peru's agriculture are generally financial/management/administrative in nature, rather than technical. There are several areas in which improvements can be made in AID's project, and two project outputs which have not been developed as follows: (1) the institutions in the REE system need greater and more sustained GOP support including timely and adequate counterpart funds, increased salaries for professionals in agriculture, and autonomy from political manipulation; (2) management and administration are still major constraints to more effective research, extension and education

programs; (3) the role of research and extension components needs to be more carefully defined with a clear division of labor and purpose; (4) the education program has not become fully integrated into the REE system although greater progress now is being made toward this end; (5) the position of Education Advisor in the NCSU contract was never filled which we believe has adversely affected the education program; (6) the need for technical assistance is more critical than ever since Peruvian professionals have been spread more thinly than envisioned in the project paper; (7) project documentation needs to be updated to accommodate some substantial changes which have not yet been documented; (8) the research focus is too narrowly concentrated on variety selection; (9) the capacity for experimental design and analysis of research data is deficient; (10) extension workers are not sufficiently involved in some NPPs with researchers carrying out both the research and the extension functions; (11) extension specialists are vital to a successful REE program, but positions remain unfilled because of discriminatory salary laws; (12) the T & V extension system which was adopted as a model by INIPA has limited application to the conditions of Peru and is not being widely adopted or utilized; (13) INIPA's infrastructure for management and administration, especially computer hard and software, is inadequate; (14) all major institutions associated with the project--AID, INIPA, and NCSU--have experienced significant levels of turnover in key staff; (15) NCSU's staffing of long-term positions needs to be improved, as only 52 of 96 person months programmed for January 1982-January 1984 have been provided; (16) INIPA's administrative structure does not provide for clear lines of research and extension direction from headquarters to the CIPAs, NPPs and experiment stations; (17) the National Management Unit which was to include UNA, INIPA, and MAF participation has apparently been allowed to languish even though the concept of overall coordination and management is unquestionably important; and (18) the National Research Support Unit has not been developed although this appears to be necessary as INIPA develops and matures.

D. Principal Recommendations*

1. Project Viability

a. AID. Extend the first phase of the project by two years and provide additional funds for the technical assistance that was used to help INIPA coordinate and program the World Bank and BID loans.

* The principal agencies to which each recommendation is addressed are identified at the beginning of each recommendation. Other agencies which are also implicated are identified in the detailed recommendations in Chapter IV. When INIPA is identified, it should be understood that NCSU should provide technical assistance.

b. AID. Review and amend project documentation to reflect material changes in conditions and provide a revised implementation schedule.

c. AID, others. Begin preliminary planning for a second phase of INIPA's Integral REE Program. AID should take the lead in meeting with representatives of BID, World Bank, CIP (and other IARCs), the CRSPs, and other principal minor donors and propose a joint task force for preliminary planning. We suggest the following approach be considered:

1. A single joint project;
2. A mechanism for joint management;
3. A minimum of five years for the second phase; and
4. A division of labor with AID providing technical assistance, training and operations budget support, and the Banks providing assistance for physical capital (vehicles, equipment, etc.).

We also suggest that the following conditions precedent be sought:

1. increased, more reliable and sustained GOP funding;
2. improved salaries for Peruvian agricultural scientists;
3. an insulation of INIPA and UNA from political influence;
4. an emphasis on INIPA's professional orientation; and
5. an improved agricultural policy climate (price policy, credit, trade, etc.).

d. AID, others. Identify alternatives for long-term funding of INIPA's operations costs, utilizing a special study. We suggest AID consider the use of PL 480 proceeds as a source of counterpart funding for AID, BID, and World Bank projects supporting INIPA's Integral REE Program for the recommended extension of Phase I, and for Phase II of AID's project. We also suggest AID carefully consider the use of development assistance funds for operations budget support over the longer term per AID/W's Policy Paper for Food and Agriculture.

2. Research Program: Phase I Extension

a. INIPA. Continue to rely heavily on the IARCs as sources of genetic materials together with technical assistance for selecting breeding lines.

b. AID, INIPA. Provide for greater involvement of UNA and selected regional universities in research in the REE system. UNA should be moved from a tangential position to a participatory position in the Integral REE Program. The output would be an increased amount of INIPA and university research and an increased number and better quality of graduate students.

c. INIPA, AID. Fortify the small grains research program. This would include added resources for barley and oats because of their economic significance to small farmers.

d. INIPA, AID. Develop a national research support unit which would: (1) establish a peer review system; (2) develop a centralized research facility for costly and highly specialized research equipment; (3) organize national research reporting conferences; (4) instigate and coordinate research with other agencies, public and private; (5) organize a national research council; and (6) provide for a germplasm bank in areas complementary to banks of the IARCs, and for indigenous non-conventional food, forage, and fiber crops.

e. INIPA, UNA, AID. Develop a national agricultural technical library at UNA and make its resources available to all research and extension workers.

f. INIPA, AID. Develop a computer/applied statistics center for analysis of research data, and processing of management/administration data. The center should include staff trained in applied statistics, and in processing of management data.

g. INIPA, AID. Form strong linkages between INIPA, and AID's APID project through the Agroecconomics Unit to enhance policy analysis, associated dialogue, formulation of revised policy, and its implementation. The Agroecconomics Unit should also assist INIPA's Jefatura with research budget allocation issues, and should bring expertise on agricultural development issues to the national policy dialogue.

3. Research Program: Phase II

a. INIPA, AID. Broaden INIPA's research program to include the development of research capabilities other than varietal selection and breeding, such as soil and crop management practices, soil fertility and plant nutrition, integrated pest control, plant physiology, plant pathology, post harvest pest and storage losses, irrigation, especially on-farm water management (including drainage systems), and livestock/forage with emphasis on small ruminants and rangelands in the Sierra, and large ruminants and improved pastures in the Selva.

b. INIPA, AID. Develop plant breeding expertise and germplasm banks that will complement that of the IARCs. Since the IARCs' products are readily available, local plant breeding capabilities should not substitute for the services of the IARCs.

c. INIPA, DGASI, ONERN. Integrate agencies involved in Water/Irrigation Research into Peru's REE system, with INIPA taking the initiative to open a dialogue on coordination of currently diverse efforts. Special consideration should be given to on-farm water management, Sierra and arid zones, and the Selva.

4. Extension Program: Phase I Extension

a. INIPA. Define the integrative role of research and extension specialists at the CIPA level. The base document for the NPP in rice correctly states the concept. Integration of research and extension within their proper roles is of utmost importance.

b. INIPA. Clarify the lines of extension supervision from the national director of extension level through the CIPAs to the zone offices. The role of Extension Supervisor should be clarified and strengthened.

c. INIPA, World Bank. Continue to adapt and modify the T & V extension system to the realities of Peruvian agriculture, with a broader focus on technology development and selection as well as the extension method. The T & V system should be continued in its pure form only if local infrastructure, equipment, budget support, and geography permit this system to function (perhaps the North Coast). The remaining areas of the country should utilize more pragmatic variants of or alternatives to T & V consistent with local resource constraints .

d. INIPA, AID. Fill vacant positions and provide necessary salary supplements to hire people who are critical to carry out the objectives of the NPPs (especially extension specialists). Steps should be taken immediately to achieve equal compensation for equal training and experience, for all INIPA personnel (Ing. Agronomos assigned as extension specialists currently receive lower salaries than if assigned as agents or researchers).

e. INIPA. Upgrade existing technological packages for commodities outside of the five NPPs with existing new research information to meet the needs of farmers.

f. INIPA, CESPAC. Contract with CESPAC for specific training of extension workers and for audio-visual extension aids since CESPAC has the capability of providing high quality assistance.

g. ENTEL, INIPA. Evaluate the cost-effectiveness of the extension teleconference system of ENTEL as a basis for improved management communication and for extension-outreach training programs.

5. Extension Program: Phase II

a. INIPA. Develop new technological packages for crops and live-stock not included in the five NPPs and associated training programs for extension workers. Special emphasis should be given to small ruminants and forages in the Sierra, and large ruminants and pastures in the Selva.

b. INIPA. Facilitate the collaboration of extension with the private sector since it can provide a significant extension function. INIPA should increase its efforts to work with the private sector

(producer groups, supply industries, and processing-marketing firms), and other public agencies (such as ECASA and the Agricultural Bank) serving agriculture.

6. Education Program: Phase I Extension

a. INIPA, AID. Complete a manpower needs assessment with careful attention given to salaries for agricultural professionals working in the REE system. The assessment should be led by INIPA's proposed Human Resources Management and Development Unit with appropriate support from AID, NCSU, and other donors.

b. AID, NCSU. Provide a long-term education advisor to INIPA through the NCSU team with the principal assignment of strengthening and supporting the Education Program of AID's project, and advising INIPA and UNA on recommendations a, and c - g, below.

c. INIPA, AID. Establish competitive INIPA research grants program at UNA for faculty, including stipends for students and variable research support costs (from AID, BID, or World Bank funds).

d. INIPA, AID. Establish a domestic thesis research support program for all participants studying abroad so they can return to Peru and carry out their research in situ.

e. INIPA, AID. Program additional funds for long-term participant trainees, who would leave for long-term training as current participants return.

f. INIPA. Carry out formal evaluations of short-term training courses.

g. INIPA, AID. Provide management training for Director and second-level staff. This should maximize the effectiveness and efficiency of the INIPA's integral management process.

7. Education Program: Phase II

a. AID, BID, World Bank, UNA. Strengthen the faculty and undergraduate program at a selected number of regional universities. Efforts should be made to coordinate the research and undergraduate theses of students at regional universities with the NPPs.

8. Management/Institutional Performance:Phase I Extension

a. INIPA, UNA. Form a national-level steering committee for the REE system in order to integrate efforts between the Agricultural and Education Sectors. This unit need not be an executive body, but should

provide philosophy (policy) and feedback to both sectors, and integrate their efforts in order to find complementarity and avoid duplication.

b. INIPA, AID. Review and improve management and organization of research and extension. Find ways to provide direct lines of command from the Chief, Deputy Chief and Executive Directors (Jetatura) to the research and extension activities at the CIPAs, and to reduce the span of command of the Chief of the Institute (AID's APID project may provide help in this area).

c. INIPA, MAF, MEF, CIP. Formalize CIP administrative support provided to scientists from sister centers and other international institutes. This support should be made official by the GOP in order to guarantee continuity of the important role played by these scientists and CIP.

d. AID, INIPA. Provide additional support to INIPA's financial management units in order to guarantee adequate monitoring, comptrolling, accounting and oportune rendering of financial statements. The quantity and quality of personnel, computers, and other equipment should be increased and upgraded (APID's Management Component proposes to do this). The computer center recommended in 2.f. above should provide computing services for management as well as for research scientists.

e. AID, NCSU, INIPA. Modify NCSU's reporting requirements based on meetings between AID, NCSU, and INIPA to clarify the purpose of reports and their frequency.

9. Institutional Performance: Phase I Extension

a. AID, INIPA, NCSU. Develop a management strategy to minimize the impact of turnover in key personnel, and to provide for an institutional memory. Consider developing a "common" set of the files and records which are kept up-to-date and available for all to utilize. All should make a special effort to assure longer term involvement of key personnel, especially NCSU, on a more timely basis.

b. NCSU. Provide long-term advisors for a minimum of two years, with more timely replacement, in order to reduce costs and assure greater productivity.

10. INIPA's Growth and Development: Phase I Extension

a. INIPA, AID. Develop an Office of International Cooperation and Development to identify, develop, coordinate, and integrate development assistance from public, private, national and international sources. Special emphasis should be given to seeking independent sources of funding for sustaining INIPA's operations over the longer term.

b. INIPA, AID. Develop and implement a strategy for educating Peruvians about high social returns to public investment in REE, in order to develop a domestic constituency for INIPA.

END NOTES

- 1 Team members included Drs. Morris D. Whitaker, Team Leader; Dan C. Galvan, Extension Specialist; David W. James, Research Specialist; George W. Norton, Agricultural Economist; and Jose Valle-Riestra, Research Management Specialist (see Appendix F for a brief resume of each team member).
- 2 USAID, Agricultural Research, Extension and Education, Project Paper, Project Number 527-0192, Washington, D.C., March 1980, p. 1.
- 3 Ibid., p. 2.
- 4 Ibid., pp. 3-6, and 20-34.
- 5 See Appendix A, PIO/T No. 527-0166-3-40003, p. 2 of 13.
- 6 National programs (NPs) is the generic term INIPA now uses to describe the original five commodity focused NPPs, plus the RSLs, and the Selva, Sierra, and Agroeconomic programs (nine programs in total). In this report, NPP will be used to describe the original five commodity programs, and NP to describe the other four programs.
- 7 AID/W, AID Policy Paper: Food and Agricultural Development, Washington, D.C.: U.S. Agency for International Development, 1982, p. 11.

II. PROJECT BACKGROUND

A. Project History

In December 1979 a baseline study of Peru's research, education and extension (REE) system was completed under the direction of an executive committee chaired by the National Institute of Agricultural Research (INIA), with joint U.S. and Government of Peru (GOP) financing, and consultant services from North Carolina State University (NCSU).¹ The study concluded that the REE system of Peru, which had developed into a highly productive national system by the late 1960's, had deteriorated substantially in the ensuing decade with the loss of much of its human capital, budget support, and viability. The baseline study presented a series of general and specific recommendations for renovating and rejuvenating the REE system with emphasis on developing a strong, well-trained staff and on integrating research, extension, and education institutions into a functional system with linkages to farmers, industry, and the international network of agricultural science.

On February 12, 1980, the U.S. Agency for International Development (AID) Mission in Peru submitted a project paper (PP) containing a proposal for strengthening Peru's REE system, which was approved by AID's Administrator on March 21, 1980.² The project provided \$2.0 million of grant funds, and \$9.0 million of loan funds to the Ministry of Agriculture and Food with INIA to serve as the implementing agency. The GOP agreed to provide \$4.0 million of local currency funding for a total project of \$15.0 million.

In August 1980 the GOP signed a Project Agreement (PROAG) with AID and the project was ready to be implemented on schedule in October 1980.

A series of exogenous factors, however, delayed formal implementation of the project. First, in 1980 the GOP began to study a plan to reorganize INIA which finally was combined with the National Extension Service (NES) in March 1981 to create the National Institute of Agricultural Research and Extension (INIPA). Second, the uncertainty surrounding INIA's future during this period made it more difficult for it to focus on developing, in conjunction with AID, a scope of work for procuring a Title XII university as contractor to provide the technical assistance. This was compounded by AID's unusually slow bureaucratic process. The request for technical proposals (RFTP) was not issued until July 24, 1981, almost a year after signing the PROAG. NCSU was selected as contractor on November 19, 1981. Third, the GOP did not comply on schedule with conditions precedent to the PROAG and associated loan agreement, principally because of the first two factors (the last condition precedent was met in April 1983). In this regard, AID had the principal management responsibility to assist INIA in meeting the conditions precedent in a timely manner.

The Contract with NCSU was signed on January 22, 1982, almost 18 months after the signing of the PROAG and six months after AID had initiated the procurement process for Title XII technical assistance.³ This substantial delay resulted in INIA/INIPA not having access to project resources for at least one and one-half and probably two full agricultural years. The implementation plan of the PP called for the PROAG to be signed by April 15, 1980, with Title XII advisors to arrive six months later (October 1980) and a five-year project life. The implementation schedule was delayed by at least 15 months, but the project is slated to terminate, according to the PP schedule, in the third quarter of FY 1985, with NCSU's contract ending early in the second quarter of FY 1985 (January 14, 1985). Holding to the termination date in the NCSU Contract and the loan disbursement schedule when implementation was delayed substantially is inconsistent with the logical framework of the project.

B. Description of the Proposed Project⁴

The broad sector 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."⁵

According to the PP:

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; and (b) provide for a continued flow of varying levels of agricultural technology which meet the needs of small and medium-sized farmers, as well as those of the associative enterprises.⁶

The PP indicates that "The project emphasizes the development of an integrated REE system ..."⁷ The project outputs were to be the formation of: (1) five National Production Programs (NPPs) for corn, rice, potatoes, small grains (wheat and barley), and grain legumes (edible beans); (2) six Regional Service Laboratories; (3) five Regional Research Centers; (4) a National Research Support Unit; (5) an Education Program to strengthen higher education institutions serving agriculture (especially UNA); and (6) a National REE Management Unit.⁸

The principal inputs to be provided by the project were: (1) technical assistance from Title XII (agricultural) university; (2) selected operational support costs; (3) salary supplements; (4) training; and (5) vehicles and equipment.⁹

1. Extension Program

The PP proposed as its Extension Program to develop five National Production Programs (NPPs) and six Regional Service Laboratories (RSLs) focused on the principal commodities which were being imported and thus contributing substantially to foreign exchange deficits. The concept was to bring together the most qualified extension workers, researchers, and other technicians from other agencies and universities in a NPP headquarter and several satellite locations in the principal producing regions. The approach was to quickly identify existing technologies and carry them to farmers in the shortest possible time in order to significantly increase production and have "... quick impact ..." ¹⁰ The NPPs were to be supported by six RSLs to supply initially soil and water analyses, and later, plant and animal tissue analyses to farmers on a fee basis, through extension agents. The PP describes the NPPs and the RSLs as comprising the extension element of the project, although this appears to be an artificial division since the NPPs are expected to engage in "... commodity specific applied research ...", and the RSLs would undoubtedly be used by researchers as well as farmers. ¹¹

2. Research Program

The PP proposed a Research Program comprised of five Regional Research Centers (RRCs) and a National Research Support Unit.

The five RRCs were each to be located at a satellite location of one of the NPPs in order to carry out applied research on problems identified in the process of the NPP's carrying existing technologies to farmers. According to the PP, "This approach is based on the premise that Peru can take advantage of a large body of fundamental scientific principles and know-how built up in other countries over the years." ¹² Hence the project does not support basic research. The project also provides for the establishment of a National Research Support Unit with expertise in such areas as genetics, plant pathology, entomology, natural resource management, etc. This unit was to provide specific research information, coordinate interregional transfer of research information, conduct research beyond the capacity of regional centers, and for commodities not included in the initial NPPs in order to provide for future expansion of the NPPs. Thus, in the integrated REE system research would be carried out at three levels--at the NPPs where researchers "... will develop the extension packages based on identified production constraints and existing, technical information ...", ¹³ at the RRCs where researchers would continually improve the extension packages by conducting applied disciplinary research; and at the national level as described above.

3. Education Program

The PP proposed an Education Program to strengthen the National Agrarian University (UNA) by providing graduate training abroad for

several of its faculty members, short-term training of faculty, equipment, technical assistance, and support costs. The Education Program was focused on strengthening higher educational institutions (especially UNA) and integrating them into research and extension efforts to develop a national REE system.

The PP also provided for major training inputs in the Research, Extension, and Education Programs of the project and at all levels from in-service training to Masters and Doctorate training abroad. The principal institution for providing training, however, was to be the UNA at La Molina, which was to provide substantial training in intensive short courses, for longer terms up to one year, and for M.S. graduate degrees. (UNA later (in 1983) expressed its preference to concentrate on graduate training and indicated it was not set up to provide short courses.)

4. National Management Unit

Finally, the project proposed to establish an REE National Management Unit in Lima. It is described as a "... key element ..." of the project "... to direct all activities included in the REE system ..."14 It was to be located in Lima and be comprised of representatives of INIA (now INIPA), the National Center for Training and Research for Agrarian Reform (CENCIRA), the universities, the Ministry of Agriculture and Food (MAF), and other institutions as deemed necessary. According to the PP:

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.15

There is no detailed description of the REE management unit in the body of the PP but the logical framework indicates \$156,000 of AID funds, and \$110,000 of counterpart funds were to be set aside for this purpose.

5. First Phase of Longer Term Effort

The project is the first phase of a longer term effort to strengthen Peru's REE system in accordance with the findings of the baseline study. According to the summary in the PP:

... the baseline study identifies objectives over a 15-year planning period which will provide for 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 the Project the focus will be on the production of crops which are GOP political priorities ... In the longer term a follow-on project could cover additional products ... The proposed Project is, therefore, the first phase of a broader program, (italics added).¹⁶

C. Unforeseen Factors Affecting the Project

Several unrelated factors not anticipated in the PP each have had a major impact on the project. Included are: (1) the creation of INIPA with the merger of INIA, the NES, CENCIRA, and SENAMA; (2) the change in INIPA's leadership; (3) adoption of the Training and Visit (T & V) extension methodology by INIPA; (4) new major, complementary REE projects financed by BID and the World Bank; and (5) bad weather in 1983 with drought in the Southern Sierra and floods in the Northern Coast. Each of these factors are discussed in turn.¹⁷

1. INIA-NES Merger

The GOP began in 1980 to study the possibility of merging the research functions of INIA and the extension functions of the NES. These discussions culminated in the creation of INIPA in March 1981. One result was to contribute to a delay in the implementation of the project (the PROAG was signed in August 1980 but not implemented until January 1982). A second problem was the confusion and uncertainty associated with the newly created INIPA as it developed its nationwide system of Centers of Agricultural Research and Extension (CIPAs) and associated policies, procedures, management structure, and staff assignments. In short, the AID project was subject to delay, reinterpretation, and a modified set of INIPA policy objectives, organizational and administrative structure, and operational procedures from those anticipated in the project paper.

2. The Change in Leadership

With the creation of INIPA came a change in leadership of the national research and extension system, which resulted in substantial changes in organization, scope and priorities, and a different perspective about the REE project than existed among the leaders of INIA and the NES. The new leadership of INIPA had not participated in the conceptualization of the PP or in the underlying baseline study, and according to reports to this team from several sources was not as supportive of the role accorded to UNA in AID's PP as the focus of the Education Program, as a formal part of the National Management Unit for REE, or as part of the National Research Program as INIA's leadership had been. Subsequently, the role and resources planned for UNA have been changed and reduced from those originally proposed in AID's project (although they are to be replaced by a World Bank loan to UNA). The

National Management Unit, per se, does not exist, has not received much support, with little effort made to develop it. INIPA manages research and extension, while UNA manages education (including its research components) and there is no formal integration of management of research, extension and education as proposed in the PP (in the form of a National Management Unit).

3. Adoption of T & V

Shortly after its initiation INIPA adopted the T & V extension system as a model for the country. A World Bank project in REE provided some impetus for the adoption of T & V (this project is discussed below). The principal protagonists for T & V, however, appear to have been INIPA's new director, and national extension director. As a result T & V was adopted as a model for the entire country and initially implemented in 12 of 18 CIPAs (which basically conform to Department boundaries), including the CIPAs where the AID project is being implemented. Technical assistance for T & V was provided by an Israeli Government firm with World Bank funding. The PP had not discussed preference for any particular extension model but had to accommodate to the T & V system in the planning and early implementation of the NPPs. Many within INIPA, AID, NCSU, and the World Bank have found with experience however that the T & V system generally is not very adaptable to Peru's conditions. Moreover, T & V's excessive emphasis on physical routine results in limited concern about the development of new or improved technologies and which ones are to be transferred. The director of INIPA and the director of extension who advocated the system have been replaced, and the technical assistance for T & V is being more sharply focused in the North Coast CIPA's where the World Bank's project is focused and where greater infrastructure exists. INIPA appears to have adopted a more flexible approach to extension and the rifts and divisions created within INIPA by attempting to impose T & V are healing, although some problems still remain.

4. New, Major World Bank and BID Projects

Two new major projects to support development of Peru's REE system were developed and approved during the period between the approval of AID's project (March 1980), and its implementation (January 1982). A sector-wide BID Project for \$55.0 million (loan) with \$26.0 million for INIPA was approved in late 1981, and a World Bank project for \$40.0 million (loan) and a matching \$40.0 million (counterpart) in September 1982. Both projects were focused on developing and strengthening Peru's REE system and had essentially the same purpose as the AID project. Moreover, they each provided funding support through INIPA (BID's funding comes through the Programa Sectorial Agropecuario of MAF to INIPA). Thus, the combined total of loan, grant, and counterpart funds for the REE system was \$121.0 million (see Table 1).

TABLE 1

Donor Assistance to INIPA for Development of Peru's REE System

Agency	Loan	Grant	Counterpart	Total
1. USAID	\$ 9.0	\$2.0	\$ 4.0	\$ 15.0
2. World Bank	40.0	---	40.0	80.0
3. BID	26.0	---	---	26.0
4. Total	<u>\$74.0</u>	<u>\$2.0</u>	<u>\$44.0</u>	<u>\$121.0</u>

Because of timing the AID project did not anticipate the BID or World Bank project (no mention is made of them in the PP). The World Bank project, however, took into account both the BID and AID projects. Moreover, it anticipated that USAID would provide the technical advisor to the Chief of INIPA as part of the World Bank project. In the words of the World Bank staff report:

An advisor would be provided to the Chief of INIPA. His main role would be to provide strong support to developing INIPA's institutional capabilities as a research and extension service organization. The draft terms of reference for this position are attached as Annex 3; USAID would finance this position. The adviser would pay particular attention to the meshing of support for INIPA from the government budget and international and other agencies into unified national programs. He would also have an important role in coordinating the internationally recruited specialists, with the overall objective of strengthening the professional environment to expedite research within INIPA, (*italics added*).¹⁸

USAID structured meetings with BID and World Bank officials during late 1981 to discuss coordination and possible integration of their separate efforts with INIPA and the role of NCSU's Chief of Party as advisor to INIPA Chief for the World Bank Project (according to verbal reports to the team from both USAID and NCSU)). However, official AID records are silent on the World Bank's proposed, AID-financed advisor to INIPA's Chief, which is unusual. In any case, INIPA leadership assigned the NCSU Chief-of-party the role of Advisor to the World Bank project by memorandum in August 1982. As a result, the Chief of Party and NCSU advisors helped in developing a national level operational plan for improving the REE system, which integrated the AID, World Bank, and BID projects in a holistic approach and eliminated duplication of effort and overlapping jurisdictions in the individual projects.¹⁹

Thus, the World Bank and BID projects had three fundamental effects on USAID's project. First, they diverted NCSU from concentrating on implementation of the USAID project for almost a year, while NCSU provided major advisory services to developing for INIPA the Integral REE Program under INIPA's auspices, with support from AID, BID, and World Bank project elements.²⁰ Second, the basic goal and purpose of the USAID project, and its conceptual approach were applied to the entire REE System in Peru, rather than just a limited geographic focus. AID was able to extend its conceptual approach far beyond the scope of its relatively small contribution in terms of funding. Finally, some components of AID's project were dropped or deemphasized, such as the National Management Unit, and the National Research Support Unit, while others were modified or expanded, such as the NPPs, the Regional Research Centers, new NPs, and support to UNA.

5. Bad Weather

A series of floods on Peru's North Coast, and drought in the South and Central Sierra have set back the NPPs in rice, and potatoes, respectively. The drought has been especially damaging with reports of seed potatoes being consumed in some areas. Because of the impact research and extension efforts in the NPPs to increase the production of these crops has been constrained. However, good weather this year (1983-84) has resulted in preliminary forecasts of a record rice crop in the Selva, and substantial production increases in the Sierra.

D. Subsequent Changes in the Project

The unforeseen factors which were discussed immediately above have affected the project in a variety of ways, some of which have been alluded to. The most important of these are discussed in this section.

1. INIPA's Nationwide Integral REE Program

One major change in the AID Project is that it has become part of a nationwide integral REE program under joint AID/World Bank/BID/GOP financing (referred to throughout this report as INIPA's "Integral REE Program" to distinguish it from the "AID REE Project"). The AID project has been integrated into the National system of CIPAs that incorporate most of the elements, concepts, and priorities proposed in the AID project but go beyond them in scope and refinement in the Integral REE Program. The NPPs, RRCs, RSLs, and training are features of a nationwide \$121.0 million program instead of the \$15.0 million AID project with its more narrow geographic and site focus.

2. Integration of Research, Extension and NPP's at CIPAs

A second change was the physical integration of the NPPs, RRCs, and RSLs within CIPAs. CIPAs have been developed for every department (in some cases more than one department is involved). There are now 18 CIPAs which are each integral units comprising research, extension, RSLs in some cases, and elements of the five NPPs, RRCs, and other special projects. Funding support from each of the major donors is provided for a subset of the CIPAs but the inputs are coordinated and integrated from the national level by INIPA with technical assistance from NCSU. Principal inputs in each CIPA include equipment and vehicles, operations budget, salary supplements, training, and technical assistance. The result is a uniform, nationwide effort with an integration of donor support that incorporates most of the elements and concepts in the USAID project.

3. No National Research Support Unit

One difference in the research component as it exists in the Integral REE Program from that proposed in the USAID project is no firm plans for a National Research Support Unit, per se.* This unit was to be comprised of a set of experts in such areas as entomology, natural resources, etc., to backstop work at the proposed RRCs although the PP is somewhat vague on how this support unit was to function and its relation to other project elements. One factor in not implementing this unit appears to be the spreading of Peru's professional agriculturalists across 18 CIPAs rather than the much more limited focus proposed in the AID project. Concomitantly, 50 such specialists have been placed in long-term training. In short, there simply are not enough qualified people to staff the National Research Support Unit. Moreover, the speciality areas proposed for the National Research Support Unit are programmed, in most cases, into CIPA level research activities, especially in the NPPs. This approach, however, seems much more labor intensive. An explicit rationale for not implementing the National Research Support Unit has not been provided by INIPA or NCSU as far as we know. Moreover, it appears to have not been implemented in the form proposed in the PP as a result of attention to more pressing priorities, and the human capital constraint, rather than from a clear, conscious decision to do so.

4. No National REE Management Unit

The AID project proposed to develop formally a National REE Management Unit, but this has not occurred and no plans exist for

* No one we interviewed expressed any clear plans for the National Research Support Unit, and there were several divergent opinions about whether it should be implemented or not, and what form it should take.

implementing this concept as far as we know.²¹ The unit was to have included participation from INIA, UNA, and MAF among others. Its purpose apparently was to set policy (with regard to the AID REE Project) and provide coordination although the AID PP contains almost no detail on this point, and the ensuing AID-GOP Loan Agreement, are silent about the National REE Management Unit although reference is made to it in the AID-NCSU contract and one NCSU quarterly report, where it was suggested that INIPA's planning office assumes the functions proposed for the National Management Unit.²² The lack of emphasis on this element of the AID project again appears to be the result of more pressing priorities, and a difference of opinion over the role of UNA in the REE system (explored in more detail below) rather than a conscious decision not to implement the unit. We believe the concept of REE management which integrates the institutions comprising the system into a national level policy and coordination process is basically valid and merits careful discussion and consideration.

5. Reduced Emphasis on UNA

The AID project proposed that UNA would become an integral part of the REE system including full participation in management (as part of the National REE Management Unit), and by receiving support for library acquisitions, equipment, operations, budget support, salary supplements, and training. The National REE Management Unit has not been implemented (as noted above) and the level of support to UNA has been reduced from that programmed in the AID PP and ensuing loan agreement, although some support is being provided.

The reduced emphasis on UNA is at least partially due to differences of opinion between INIPA's previous director, and faculty members at UNA regarding the role and viability of the other's institution. An especially difficult problem was that of defining UNA's role in short-term training. Also UNA had received a separate World Bank loan and INIPA viewed the loan as a substitute for at least part of the support that had been provided for UNA in the AID project. The result is that INIPA coordinates and manages the research and extension elements of the REE system, while management of higher education is in the hands of UNA and other educational institutions (which are not discussed in the PP). The coordination of higher education (formal and informal) in the REE system is done, de facto, on an ad hoc basis. The situation, however, seems to be improving. Faculty at UNA are more confident in the viability of INIPA and are much more supportive of its new director, Dr. Victor Palma, who was appointed in August 1983. Support has been provided to UNA by the AID project for salary supplements (in support of NPPs and selected graduate faculty), graduate training for faculty in the U.S., and other operations expenses. INIPA personnel are being trained at UNA and there is a positive collaborative working relationship between INIPA and UNA. The need still exists, however, to more fully integrate UNA into the National REE system. The possibility of improved working relationships between INIPA and UNA should be utilized to focus more directly and collaboratively on a strategy to do so.

6. Shift in Technical Assistance from Education to Agricultural Economics

The position of long-term education advisor (provided for in AID's contract with NCSU, along with long-term research, and extension advisors) has been dropped, and the position of agricultural economist added. The position of long-term education advisor has never been filled, although NCSU has provided substantial amounts of recurring short-term advisory services in education. The fact that the position of long-term education advisor was not filled meant that the education program as one of the three main elements of the REE system did not receive the same attention as the Research and Extension programs, especially early in the life of the project. This may have contributed to the tendency to limit UNAs participation in the REE. In any case, education has not received the same priority as research and extension and the position of long-term education advisor has been eliminated. At the same time, several special projects and economics issues have emerged in INIPA and an agricultural economics position has been added (these special projects will be discussed below).

7. Addition of National Programs with a Systems versus Single Crop Focus

Three new National Programs have been developed within INIPA (in addition to the five NPPs and the RSLs) that are characterized by a systems orientation, rather than the single crop focus of the NPPs. Included are the Selva Program, the Sierra program, and the Agricultural Economics program. These three plans have one common theme--the need for a more systems oriented approach that considers the broader socio-economic environment in designing research and extension programs. The addition of these three projects also reflects the broader base of support inherent in the integral project (with World Bank and BID funding).

8. Technical Assistance from NCSU for Coordinating and Programming World Bank and BID as well as AID Resources

The AID project proposed technical assistance for implementing the AID project per se, especially in the five principal areas where the five commodities in the NPPs were produced. The focus was to have been on extension, applied research, and education efforts to quickly increase production, and start applied research on problems for which existing technologies were not available. Instead, NCSU technical assistance initially was diverted to helping INIPA conceptualize, coordinate, integrate and reprogram the grant, loan and counterpart funds from World Bank, BID and AID into the Integral REE Program.

9. Delay in Implementing AID's Project

The decision of INIPA to combine the World Bank, BID, and AID projects into the Integral REE Program resulted in a substantial delay in implementing the various elements of AID's project, especially the NPPs. NCSU advisors were basically occupied in the conceptualizing-integrating-reprogramming effort at the national level from the arrival of Dr. Arthur Coutu in January 1982 until late into the fourth quarter of CY 1982. While some inputs had begun to flow, especially training, implementation of the NPPs really began in earnest in June 1983, although extensive planning had started in late 1982.

The development of INIPA's single nationwide Integral REE Program resulted in a delay in implementing AID's project of about 12 months from the date of signing its contract with NCSU, in addition to the slippage of 15 months from the date the project was originally slated to begin (October 1980). Thus, the project was more than two years behind schedule when it was finally implemented. It had expanded, however, to a \$121.0 million effort instead of a \$15.0 million project with a limited geographic focus. Moreover, the Integral REE Program was founded on the conceptual approach in the AID project, and patterned substantially after it. In our opinion, the benefits to Peru from the integral approach far outweigh any negative effect from not implementing the AID project according to its original schedule, especially given the longer term focus of the AID project and its proposed second phase.²³

10. Linkages to the International Agricultural Research Centers

The development of INIPA's Integral REE Program resulted in a research-extension model which purposefully and clearly defined the role and integration of international agricultural research centers (IARCs) in support of Peru's REE system. AID's PP had proposed linking the IARCs to the REE system but did not propose how this was to be done. INIPA with NCSU assistance developed a model for five NPPs (in the course of developing the Integral Program) which appears to be very viable. Long-term advisors from the IARCs are named as co-leaders of the NPPs and serve as an institutional link. The IARCs provide genetic material for variety selection and carry out breeding work and crossing. They also provide the training of Peruvian scientists at IARC headquarters, and technical assistance for short-term training in Peru. The IARC leader assists the Peruvian leader in variety tests and extension efforts including on-farm demonstrations. The approach appears to be unusually productive, especially in potatoes (CIP), rice (CIAT), and corn (CIMMYT).

11. Incorporation of CRSPs as part of INIPA's Integral REE Program

Of special importance to AID is the integration of the AID/W centrally funded Small Ruminants and Tropical Soils Collaboration Research Support Programs (CRSPs) as important components of INIPA's Integral REE program. As a result, these CRSPs are now more highly

complementary to the AID REE project and are elemental components of a broader natural REE system.

They can be especially important for the new NPs since they potentially can provide backstopping for much of the research (in the same way as the IARCs backstop research for the NPPs) with the Tropical Soils CRSP backstopping the Selva program, and the Small Ruminants CRSP the Sierra program.

E. The Economic and Social Environment and its Effect on the Project

1. Inflation

A weak national economy, the difficulty of reducing the complex of administrative procedures put in place by the previous government, and recent political unrest have hindered the AID project since its inception. Peru experienced an inflation rate of approximately 125% in 1983. The failure of wages to keep pace with inflation has meant that salaries of Peruvian nationals working in the REE system have fallen significantly in real terms.

2. GOP Support for the REE

The attempt by the GOP to bring spending more closely in line with revenue, to manage its debt at a time of falling export earnings and the resulting de facto low priority accorded to agricultural development in spite of its high priority in the new Constitution has resulted in drastic cuts in the operating budgets of government agencies serving agriculture. This has affected the Integral REE Program through delays in release of counterpart funds required under the AID, BID and World Bank loan agreements. For example, the AID contract called for logistical support to NCSU for office furniture, telephones, vehicles, supplies, etc. from GOP funds. When these were not forthcoming, due in part to the economic crisis, the project was delayed until AID contract funds were authorized for this purpose. The impasse in release of other counterpart funds was not resolved until use of PL480 Title I funds was authorized, reflecting the lack of priority given to agricultural research, extension, and education by the GOP. This lack of priority is especially troublesome in light of the severe deterioration of Peru's agricultural REE system during the seventies. Peru's expenditures for agricultural research declined an average of 4.5 percent annually from 1978-1980 and the growth rate of agricultural production was stagnant. In 1980, Peru spent only 0.33 of one percent of agricultural gross domestic product on agricultural research compared to 0.92 percent in Latin America as a whole. By contrast, Brazil spent 1.15 percent of the value of agricultural GDP on research in 1980 and experienced an average increase of 5 percent annually in agricultural production during the seventies.

3. Terrorism and Staffing

Political unrest exemplified by terrorist activities in Southern Peru and in Lima has received substantial news coverage in the United States. This may have created difficulties for NCSU in recruiting staff, particularly for long-term positions. According to reports from NCSU staff, five of six candidates interviewed for the recently vacated research coordinator position apparently were influenced to decline the offer by a perceived threat to family security.

4. Policy Restrictions

A variety of policy restrictions which impinge on the agricultural sector influence the project through their effects on the demand for new technologies. For example, the Rice Marketing Enterprise (ECASA), a GOP agency, has a monopoly for purchasing rice at a fixed support price. This approach to marketing has distorted producers' incentives and the allocation of resources in agriculture. The support price has been changed periodically and at least for a time appears to have been below the cost of production and the world market price, while at other times it has been above the world price.²⁴ Furthermore, pricing policies have resulted in regional differences in producer incentives. Prices are fixed at approximately the same level throughout the country resulting in substantial transportation subsidies for rice produced in the Selva where costs of production also are lower. This has encouraged rice production in that area relative to the cost.

Public policies affecting inputs also influence the demand for results of agricultural research, extension and education. It appears that credit needs of farmers for input purchases are not adequately being met because of cumbersome loan procedures. This may be due to the use of subsidized credit by the Agrarian Bank of Peru which, along with low payback rates, has caused decapitalization within the agricultural banking system.²⁵ While the team senses that public policies affecting the agricultural sector have influenced the REE project, the extent of their impact is difficult to assess.

A government freeze as a result of IMF austerity requirements on regular positions (nombrados) has also affected the AID project because only nombrados can obtain scholarships for study abroad under GOP auspices. As a result most new personnel in the REE project under BID, World Bank and AID funding have been hired on contracts to avoid the hiring freeze. Not only are such people ineligible for training abroad, but they are in a very tenuous employment situation where their job security is reduced. This suggests they may be lost to the REE system in the longer term unless the situation is remedied.

END NOTES

- 1 Peru, Ministry of Agriculture and Food (MAF), National Institute of Agricultural Research (INIA), and U.S. Agency for International Development (USAID), Baseline Study of the Peruvian Agricultural Research, Education and Extension System, Lima, December 1979.
- 2 USAID, Agricultural Research, Extension and Education, Project Paper, Project Number 527-0192, Washington, D.C., March 1980.
- 3 A project coordinator for INIPA was hired with GOP (counterpart) project funds in December 1981 which may also be viewed as a starting point of the project.
- 4 As proposed in USAID, Agricultural Research, Project Paper, pp. 3-36, Annex II, Exhibit 2.
- 5 Ibid., p. 1. Note that the terms goal, purpose, outputs, and inputs used in this section have very specific meanings in USAID's parlance and programming process. The project is expected to contribute directly to achievement of the sector goal but not necessarily result in achieving the goal by itself. In contrast, the project is expected to result in achievement of the project purpose by generating or producing a set of project outputs. Finally, project inputs are combined in various ways spatially and temporally to produce the outputs, which collectively contribute to or comprise the full achievement of project purpose and help to achieve the broader sector goal. The description of the project which follows should clarify and illustrate these concepts.
- 6 Ibid.
- 7 Ibid., p. 3
- 8 Ibid., pp. 3-6
- 9 Ibid, pp. 20-34
- 10 Ibid., p. 23
- 11 Ibid., p. 22
- 12 Ibid., p. 28
- 13 Ibid.
- 14 Ibid., p. 3
- 15 Ibid., p. 4
- 16 Ibid., p. 2

- 17 Socioeconomic factors affecting the project are discussed in Section II.E below.
- 18 The World Bank, Peru: Agricultural Research and Extension, Staff Appraisal Report, February 26, 1982, p. 17. INIPA had encouraged the World Bank to accept the concept of an AID-financed advisor and make it specific in the World Bank project.
- 19 USAID was apparently ambivalent about this and initially wanted NCSU to proceed to implement the USAID project, rather than devote major time and effort to the integration of the three separate donor projects, which created a dilemma for NCSU. The Mission later moderated this position as the advantages of the broader approach became more apparent. See NCSU's "Progress Report for the period January 22, 1982 to March 31, 1982" (submitted as A. J. Coutu's Trip Report); and "Progress Report for the period April 1, 1982 - June 30, 1982," by Dale Bandy for the only written record we could locate on this matter.
- 20 NCSU began this integration effort on January 22, 1982 with the arrival of Dr. Arthur Coutu as Interim Chief of Party, who was replaced by Dr. Dale Bandy in April 1982 as Interim Chief of Party after Dr. Coutu injured his back. Dr. Bandy was replaced by Dr. Pedro Sanchez in August 1982 who became the Chief of Party. During the period January - August 1982, most of Coutu's and Bandy's efforts went toward the reprogramming effort as their quarterly reports indicate, although some effort was directed toward the implementation of AID's REE project. Dr. Sanchez continued this emphasis during the fall of 1982, but began to focus more effort on developing the NPPs as part of the Integral Program. Thus, there was a transition toward implementation of the Integral REE Program (including AID's components) in the third and fourth quarters of 1982. But the NPPs did not really begin to function until well into 1983.
- 21 A Comite Coordinador del Proyecto IEE was formed with INIPA, UNA, and NCSU membership to serve as the National Management Unit. The Comite has never functioned because of inter-institutional conflicts.
- 22 NCSU, Progress Report for the Period January 22, 1982 to March 31, 1982 (Coutu's Trip Report).
- 23 See USAID, Agricultural Research, Project Paper, p. 2.
- 24 David Orden, Duty Greene, Terry Roe, and G. Edward Schuh, "Policies Affecting the Food and Agricultural Sector in Peru, 1970-1982: An Evaluation and Recommendations," Department of Agricultural and Applied Economics, University of Minnesota, December 1982. (Mimeographed draft of report prepared for USAID.)
- 25 Ibid.

III. PROGRESS TOWARD PROJECT PURPOSE

A. Introduction

This chapter analyzes the progress being made in achieving the purpose of AID's project. First, INIPA's Integral REE Program is described, delineating the contributions of the individual donors. Second, inputs through AID's project to INIPA's Integral REE Program are compared to those programmed in the AID project paper (PP) and the degree to which expected outputs are coming on stream for each of the four major components of AID's project--extension, research, education, and the management unit--is described. Third, there is a discussion of the new project outputs--the Agroecconomics, Sierra, and Selva Programs. Finally, we give our judgement of the progress made in achieving the AID project purpose on the basis of this comparison of planned and actual inputs and outputs.

The discussion in this chapter is conditioned by two factors--the artificial distinction among extension, research and education as presented in the PP; and a flaw in the logical framework of the PP. The division of research, education and extension in the PP does not pose a problem for the analysis in this chapter. The division, however, may give the impression that agricultural research, extension and education are relatively independent and separate activities when, in fact, they are interrelated and comprise a highly complex, interactive system. Consequently, the presentation which follows uses the format of AID's PP in treating the elements of the REE system as if they were independent, mainly for consistency and purpose of exposition. Research and extension are dealt with in the same section, however, to highlight their interdependence.

A flaw in the logical framework of the project imposes a constraint on the input-output approach described above. The principal problem is that the input section of the logical framework matrix shows the AID and GOP dollar levels for five major items: extension, research, education, REE management unit, and technical assistance. Technical assistance, however, is an input to the other four project elements and it is not distributed among them in the plan. Furthermore, INIPA and AID accounting reports do not provide a basis for measuring the flow of the detailed input categories (equipment, vehicles, training, technical assistance, salary supplements, etc.) to the four major project components.

As a consequence of these constraints, this chapter assesses the degree to which outputs are starting to appear for the separate program elements, but compares programmed and realized inputs in a more aggregated fashion. More detail is provided on input allocations where it is available.

B. Description of the Integrated REE Project

As noted in the previous chapter, NCSU technical assistance has played a key role in helping INIPA coordinate, integrate, and reprogram the grant, loan, and counterpart funds from the World Bank, BID, and AID to develop INIPA's Integral REE Program.

INIPA is divided geographically into 18 CIPAs which have integrated and coordinated extension and research functions and whose boundaries coincide largely with departmental lines. The three donors agreed to provide support for the 18 CIPAs along geographical lines as shown in Figure 1, principally for the classes of inputs proposed in AID's PP-- vehicles, equipment, operation funds, training, salary supplements, and technical assistance. The World Bank provides funds for the five northern CIPAs, AID provides funds for the center and Selva CIPAs, and BID provides funds for the remaining CIPAs located primarily in the South, although there is some overlapping of funding support within some CIPAs. For example, BID also supports activity in the Amazon area of CIPA X, while AID provides some support to CIPA XIV, and AID, BID, and World Bank provide support to CIPA XI. In addition AID provides the technical advisors (through NCSU) for assisting INIPA's headquarters with overall planning, coordination, and management.

The operational units of INIPA include 53 experiment stations and sub-stations, 36 promotion zones, 227 extension agencies, and 115 extension sectors. A complete listing of CIPAs by source of support, as well as the locations of the experiment stations, sub-experiment stations, extension specialists, and extension agencies are shown in Appendix C. Four of the five NPPs are centered at USAID-supported CIPAs: the national corn program at Tarapoto, the Selva rice program at Tarapoto (the headquarters for coastal rice is at Chiclayo which is also the headquarter for the NPP in rice), the legumes program at Ica, and the potato program at Huancayo. The cereals program is located at the BID-supported CIPA at Cuzco.

The RRCs which provide research support to these five NPPs are located at the principal experiment stations of the headquarter CIPAs for the NPPs. The other experiment and sub-experiment stations of the headquarter and other CIPAs also form a part of the research support to the NPPs as satellite sites (see Appendix C). Finally, the experiment stations of all the CIPAs are also involved in other research work which is complementary to the NPPs (such as the tropical soils work at Yurimaguas and small ruminants at Cuzco). It is clear that the integration of the various donor funds has enabled AID to have a much larger impact on the national REE system than it otherwise would have had.

Thus, the AID PP concept of a highly focused REE system at five sites has been expanded to a nationwide focus with 18 CIPAs which integrate research, extension and education. While the focus on the five NPPs (corn, rice, potatoes, small cereals, and edible legumes) has continued, the geographic focus has been broadened, the research

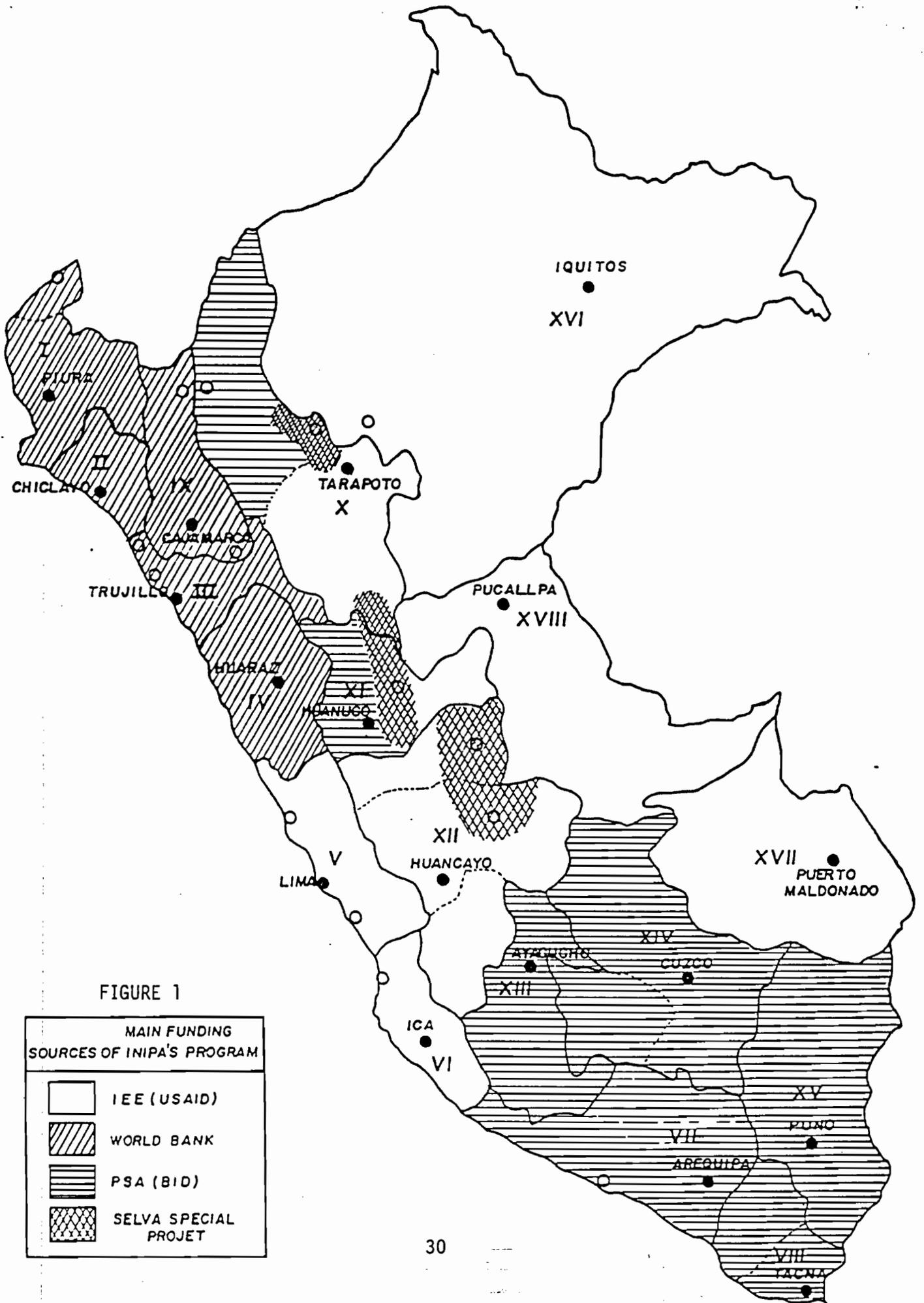


FIGURE 1

MAIN FUNDING SOURCES OF INIPA'S PROGRAM	
	IEE (USAID)
	WORLD BANK
	PSA (BID)
	SELVA SPECIAL PROJÉT

portfolio has been expanded, special area development projects are being implemented, and four other national programs (NPs) are under planning or implementation.

In addition to the five commodity programs, other NPs are the RSLs, the Agroecconomics Program, the Sierra Program, and the Selva Program. The latter three were not mentioned in the original PP, and add social science and farming systems elements to INIPA's Integral REE Program (these NPs are described in greater detail below). Each of the nine national programs has a base document which describes the objectives; priorities; work locations; strategies for research, extension and training; staff; operational budget; and the first year's work plan.

There are leaders and co-leaders responsible for technical direction of each program. The leaders are Peruvians employed by INIPA, while the co-leaders are technical advisors. The World Bank agreed to support seven international co-leader positions, BID agreed to additional support for the Agroeconomic Program, and AID agreed to continue its support through NCSU to INIPA Headquarters, and the Collaborative Research Support Programs (CRSPs) in small ruminants and tropical soils.¹ The co-leaders of the five national production programs are associated with the international centers (primarily CIMMYT, CIAT, and CIP).

The AID project also has fostered cooperation between INIPA and the special projects office of the Prime Minister, INADE, which has six Selva projects. It has assisted INIPA in integrating other sources of funds into its Integral REE Program including the AID-funded CRSP's; bilateral technical cooperation projects with Israel, Canada, Germany, the Netherlands, and Switzerland; and projects from multilateral agencies such as the Interamerican Institute for Agricultural Cooperation (IICA) and the Research Network for Amazonian Agriculture (REDINAA). The latter organization, which coordinates research in six countries, in the Amazon region, received substantial assistance from NCSU at the conceptualization stage and in obtaining grant funds.

The other major institution impacted by the Integral REE Program is the UNA which plays the major role in graduate training. AID monies have supported masters level training during 1982-84. World Bank is slated to provide substantial support at UNA over the next four years.

C. AID REE Project Inputs

1. Programmed versus Actual Expenditures

The logical framework in the AID REE project paper provides funding implementation targets by aggregate program categories for each year of the project. A comparison of programmed and actual project expenditures from INIPA records is provided in Table 2 by calendar years. Because the technical assistance contract was not signed until January 1982, there were no AID disbursements for 1981. In 1982, there were no disbursements

TABLE 2
 Programmed and Actual Expenditures by AID and the GOP for AID's REE Project
 (Thousands of Dollars)

Program	1981		1982		1983		1984		1985		GRAND TOTAL		
	Programmed	Expended	Programmed	Expended	Balance								
I. Extension Program													
A. National Production Programs													
- AID	942	---	752	---	601	1,235	481	---	385	---	3,161	1,235	1,926
- GOP	101	300	127	127	159	400	200	---	248	---	835	827	8
B. Regional Service Labs													
- AID	220	---	176	---	141	455	113	---	90	---	740	455	285
- GOP	63	25	79	79	99	10	124	---	155	---	520	114	405
II. Research Program													
A. Regional Research Centers													
- AID	345	---	275	180	220	757	176	---	141	---	1,157	937	220
- GOP	93	275	117	117	147	300	183	---	230	---	770	692	78
B. National Research Support Unit													
- AID	367	---	294	198	235	534	188	---	150	---	1,234	732	502
- GOP	45	100	56	56	70	200	88	---	111	---	370	355	14
III. Education Program													
- AID	175	---	139	132	111	140	89	---	71	---	585	272	313
- GOP	29	---	37	37	46	10	56	---	74	---	242	47	195
IV. Management Unit													
- AID	47	---	37	---	29	29	24	---	19	---	156	29	127
- GOP	13	---	17	17	21	21	26	---	33	---	110	38	72
V. Technical Assistance													
- AID	400	---	400	369	350	600	350	---	200	---	1,700	969	731
- GOP	45	---	45	45	40	---	40	---	20	---	190	45	145
SUBTOTAL—AID	2,496	---	2,073	879	1,687	3,750	1,421	---	1,056	---	8,733	4,629	4,104
SUBTOTAL—GOP	300	700	478	478	582	941	717	---	871	---	3,037	2,119	918
TOTAL—AID + GOP	2,895	700	2,551	1,357	2,269	4,691	2,138	---	1,927	---	11,770	6,748	5,022
Contingencies of Inflation	550	---	580	40	615	428	710	---	775	---	3,230	468	2,762
	3,435	700	3,131	1,397	2,884	5,119	2,848	---	2,702	---	15,000	7,216	7,784

Source: INIPA Records, provided by Dale Bandy, Chief of Party, NCSU Mission to Peru.

for the Extension Program or Management Unit, but major portions of the programmed Research, Education, and technical assistance budgets were spent.² In 1983, every major program except the Education Program and the Management Unit overspent the budget programmed in the project paper by approximately a factor of 2 to 3.5, making up for the lack of expenditures in 1981. Cumulative expenditures of AID funds through December 1983 are currently at 75 percent of the cumulative programmed level.

One major inconsistency is noted for the record. Substantial expenditures are recorded for the National Research Support Unit in 1982 and 1983, and modest expenditures for the National Management Unit from both AID and GOP sources. These units, however, do not exist, and there are currently no plans for implementing them according to reports to this team from USAID, INIPA, and NCSU. Apparently these expenditures are misclassified and we are not certain as to what program element they actually supported.

Peruvian counterpart funds met or exceeded projections for every year in the aggregate and cumulative GOP expenditures were 147 percent of those programmed through December 1983. Aggregate numbers are misleading, however, because they do not indicate the timing with which funds were released. Substantial problems have existed in the REE project in obtaining the timely release of budgeted counterpart funds. The AID mission played a key role in securing the eventual release of those funds.

A listing of AID cumulative expenditures under the REE project as provided by USAID/Peru Controllers Office is shown in Table 3 by calendar years. There are several discrepancies between Tables 2 and 3, for which no explanations have been provided but which may be due to differences in accounting procedures. The most prominent is the relatively large divergence between accumulated AID expenditures as reported by INIPA (\$4.629 million) and by AID (\$3.439 million) for the same period. Another interesting discrepancy is AID's report that \$13,647 was spent for technical assistance in 1981, with none being reported spent by INIPA (the technical assistance contract was not signed until January 1982). Moreover, the AID report lumps all technical assistance expenditures under the National Management Unit (which does not exist) while INIPA reports technical assistance as a separate line item. Neither report apportions technical assistance as an input to the major program elements.

The AID report does provide greater detail on apportionment of inputs among major project elements as compared to the INIPA report, but the data may be incomplete or misclassified. For example, training is reported in Table 3 for the National Research Support Unit (which does not exist) but none for the RRCs, which we know have received long and short-term training.

Thus, neither report permits us to clearly identify the magnitude of each of the various classes of inputs expended by major program element and sub-element.

TABLE 3

ACCRUED EXPENDITURES OF AID
LOAN & GRANT UNDER THE USAID REE PROJECT

(527-T-073)
(527-0192)

	AS OF 12/31/81	AS OF 12/31/82	AS OF 12/31/83
I. <u>Extension Program</u>			
A. <u>National Production</u>			
IA ₁ Technical Assistance			
IA ₂ Training		\$131,743	\$112,600
IA ₃ Commodities			486,762
IA ₄ Support Costs		25,000	638,032
B. <u>Regional Laboratories</u>			
IB ₁ Training			
IB ₂ Commodities			372,144
IB ₃ Support Costs			5,707
II. <u>Research Program</u>			
A. <u>Research Center</u>			
IIA ₁ Technical Assistance			
IIA ₂ Training			
IIA ₃ Commodities			190,282
IIA ₄ Support Costs		17,500	384,695
B. <u>National Research Support</u>			
IIB ₁ Technical Assistance			
IIB ₂ Training			6,561
IIB ₃ Commodities			
IIB ₄ Support Costs			25,163
III. <u>Education</u>			
III ₁ Technical Assistance			
III ₂ Training			42,539
III ₃ Commodities			
III ₄ Support Costs			24,379
IV. <u>National Management Unit</u>			
IV ₁ Technical Assistance	\$ 13,647	542,178	1,129,800
IV ₂ Support Costs			20,735
IV ₃ Office Furnishings			
TOTALS	<u>\$ 13,647</u>	<u>\$716,421</u>	<u>\$3,439,399</u>

SOURCE: AID/Peru, Controllers Office

2. Technical Assistance

Detailed expenditure data are not available by input categories such as vehicles, equipment, facilities, salary supplements, operations budget support, training, and technical assistance for the Research, Extension, and Education Programs, and their sub-elements or for the Management Unit. Partial information on training is available and is reported in the education section below.

Technical assistance (TA), both long and short term, is a major input to the other program categories. The key personnel listed in the NCSU contract document were as follows:

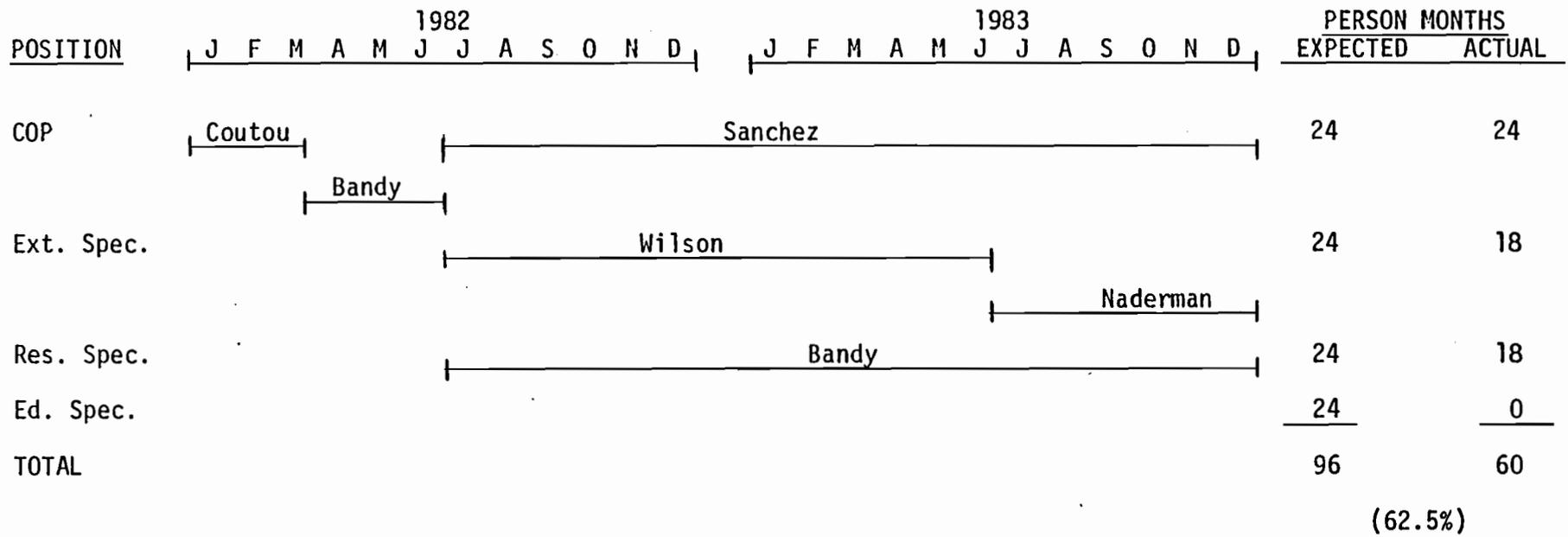
Campus Director: Dr. J. Lawrence Apple
Assoc. Campus Director: Dr. A. J. Coutu
Chief of Party: Dr. Pedro A. Sanchez
Extension Program Leader: Dr. George Naderman
Research Program Leader: Dr. Grant Scobie
Education Program Leader: Dr. Eddie Echandi

The Campus Director and Associate Campus Director position have been filled as listed. The Chief of Party position was filled with two interim people (Dr. Coutu--January 1982, and Dr. Dale Bandy--April 1982) until Dr. Sanchez arrived in August 1982. Dr. Sanchez left as Chief of Party in December 1983 and was replaced by Dr. Bandy. The Extension Program Leader position was filled by Dr. George Wilson in mid-1982 (six months behind schedule) and Dr. Naderman arrived in mid-1983. The Research Program Leader position was filled by Dr. Bandy in mid-1982 (also six months behind schedule) when Dr. Scobie did not become available as planned. The Research position has been vacant since Dr. Bandy became Chief of Party in December 1983 but reportedly will be filled soon. The Education Leader position was never filled and eventually changed to an agricultural economist position which was filled beginning January 1, 1984. In total, NCSU has provided 52 person-months of long-term advisory services through December 31, 1983, compared to a programmed level of 96 person-months for the same period (see Appendix D, Table 3).

Figure 2 is a flow chart of NCSU long-term project personnel for two calendar years as reported orally by the associate campus coordinator, which indicates that NCSU fulfilled 62% of its commitment to long-term staff assignments in Peru. (It will be noted that there is some discrepancy between the data of Figure 2 and those summarized above from Appendix D. It is believed that the official historical records are subject to question; the problem of incomplete and tardy project documentation has been referred to elsewhere.)

In addition to the long-term TA, NCSU provided short-term assistance as follows: in 1982, 7.93 person-months involving 10 faculty; in 1983, 14.86 person-months involving 14 faculty, 6 of whom had more than one TA

FIGURE 2. PROJECT STAFFING CALENDAR - NCSU CONTRACT



assignment in Peru (Appendix D, Table 1). The length of short-term duty ranged from 0.17 to 2.97 person-months with an average of 0.74 person-months per visit. There was a total of 30 short-term TA trips during the two-year period. As of December 31, 1983, NCSU had fulfilled about 36% of the 63 person-months of short-term TA specified in the contract.

Other short-term TA was provided by the IARCs: 9 people worked a total of 9.1 person-months during the two years with more than 90% of this occurring in 1982. In this category of activity, NCSU provided in-country logistical support while the IARCs themselves covered salaries.

In total, therefore, there were about 92 person-months of TA, both long and short term. The total Integral REE Program is the product of this TA. The record indicates that most of the IARC TA occurred during the first year (1982) when the target crops were being selected and the NPPs designed. It was also during this period when implementation of the AID/NCSU REE project was being delayed while BID, World Bank, and other minor donor projects were being integrated. The majority of the NCSU short-term TA occurred during the second year (1983) which was the time of NPP implementation.

It is not possible to clearly segregate the individual research and extension TA inputs for reasons already given; the research/extension components were specifically designed to be tightly coordinated. This has led to problems discussed below in monitoring and managing research and extension functions. The most visible elements of education TA are the establishment of international and local beca programs, and the selection of persons to fulfill these becas.

The interim Chiefs of Party played vital roles in helping INIPA to (1) conceptualize the integral program with other donor inputs and (2) design and implement the NPPs. The designated Chief of Party continued the strong precedent and guided INIPA in personnel selection and implementation of the NPPs. The substitute Research Specialist, both because of his preceding long-term experience in Peru and his service as acting Chief of Party played a major stabilizing role in expediting project establishment and direction. He was especially effective in setting up plans of work and itineraries of the numerous short-term advisors and in expediting their assignments while in country. The Chiefs of Party and research advisor must be credited with integrating the IARCs in the NPPs. The substitute long-term Extension Advisor had the difficult task of helping INIPA adapt the T & V extension system, which was superimposed on the REE system somewhat arbitrarily. The compromise reached in terms of the role and area of activity for T & V was undoubtedly the best that could be expected under the circumstances. The designated Extension Advisor is seen presently as fulfilling the important task of helping to define the responsibilities at different levels of extension leaders and of developing management and monitoring guidelines and of providing management training for extension leaders. Short-term educational advisors have been particularly important in the education area where approximately 11 months of short-term assistance has fulfilled some of the duties programmed for the long-term education

advisor, although there has been a tendency to focus training as an input rather than on the Education Program.

Inputs provided by World Bank and BID to the Integral REE Program are also significant although both donors have dispersed to date far less than the amounts programmed. This is due to the failure of Peru to meet conditions precedent to their loan agreements or to provide counterpart funding on a timely basis. BID spent roughly \$4.0 million during 1982-83, including \$1.4 million for research support, \$2.2 million for extension support, \$0.3 for training support, and \$0.1 million for seed production. The World Bank has spent approximately \$2.0 million with the major part coming in the second half of 1983, while the GOP has provided \$1.9 billion soles of counterpart funding for the World Bank project (about \$760 thousand). World Bank monies spent prior to 1983 mainly provided technical assistance in extension under a contract between the World Bank and Israel.

D. Research and Extension

1. Conceptual Overview

Research and extension within INIPA are most easily evaluated as a single operation because they are so intimately associated in terms of goals, purposes, project outlines, work plans, and personnel. In the organizational structure, research and extension functions are separated, but in fact research people are dedicating a large portion of their efforts to extension activities. Sometimes research is being done in collaboration with extension personnel and other times it is not. The degree of cooperation is partly related to personalities within the system as well as the professional development of individuals in both extension and research.

Despite their intimate association, there is a need to clearly separate the functions of research and extension so as to understand their respective roles in technology development and transfer. Having a clear understanding of their unique roles is prerequisite to managing and evaluating each function. It is also necessary for understanding how and where they interface and how to obtain the highest level of efficiency from their shared elements.

Separating research and extension for purposes of administration and evaluation also facilitates the job definition and professional development of the individuals involved. In INIPA there seems to be considerable confusion as to the specific function of extension as presently constituted. In addition, there is little information processing and storage facility such as manuscript review (technical and editorial details), nor adequate printing plant, or library within INIPA. Neither the researchers nor their plans of work convey an awareness of publication as an important element in the finalization of a research project.

Research produces information. Information here refers to knowledge and understanding of natural and behavioral phenomena and interactions. When new information comes forth which indicates that certain factors can be managed to favorably alter natural or behavioral processes, then technologies or institutions are developed or changed to utilize the information.

It is important that research results be published, for example, in scientific journal articles, or experiment station bulletins and circulars. This provides communication among researchers and helps ensure that the research is relevant and not redundant. In the process, understanding grows over time and bases of research objectives and methodologies expand. In terms of our definition, research results are not "information" until they have passed the acid test of critical peer review.

Publications are also important to the research director, who is frequently responsible for directing activities of scientists outside of his own area of expertise. For example, a director may have established himself as an effective researcher in plant nutrition and have on his scientific staff plant breeders, entomologists, soil physics, and irrigation researchers. A researcher who publishes, demonstrates to his director that his peers acknowledge that his scientific work is acceptable. Consequently, research publication is an indispensable tool to a research director in evaluating the productivity of his staff.

Extension transfers information, often in the form of improved technologies, to farm managers who apply it to suit their needs. Extension involves teaching. As such, it utilizes various kinds of teaching devices to convey information. These include public meetings, workshops, radio and TV sessions, and result demonstrations. The latter may show both the method of a fertilizer application, for example, and the results as determined by measured yields. A result demonstration is an important link between research and extension.

Field trials can and should be done by either research or extension but preferably through collaboration of the two. The major direction or leadership for a given trial will be assumed by extension if the field trial is principally a demonstration of management practices already well understood. An example is a soil tillage operation for corn that conserves moisture, provides for uniform seeding depth and uniform germination, the result of which is better and quicker stand establishment and decreased weed problems from uniform shading.

The researcher will logically assume the leadership role for off-station research plots and field trials when the experimental designs are structured to clarify interactions between two or more controlled variables. Sometimes applied research and result demonstrations will be done by an individual having a split assignment, say 50 percent research and 50 percent extension. In this instance, the professional would be liable to directors from both sides of the system.

Two-way communication is built into the jointly managed field plot research and demonstration program because the researcher can observe management problems in a broadly distributed sample of field conditions. The result demonstration can be used by the extension specialist to "fine tune" recommendations provided by research to maximize the usefulness of the new technology to farmers.

The concepts in this overview will be amplified in the analysis that follows on individual factors of research and extension. The particular factors reviewed are specified in the Terms of Reference and in the Plan of Work. The order of presentation does not imply any ranking or prioritization of the separate factors.

2. Research and the National Production Programs

One of the major outputs of the Integral REE Program has been the establishment of National Production Programs (NPPs) in each of five commodities, namely potatoes, corn, rice, edible legumes, and small grains. Each NPP has an associated Regional Research Center together with extension specialists to communicate the RRC results to farmers via extension agents and sectoristas (para-professionals). Table 4 summarizes the NPP locations, associated RRCs and the number of sub-stations within each RRC and the number of professional researchers and extensionists.

The Integral REE Program includes a NP of service laboratories (RSLs) with three central service laboratories at La Molina, Yurimaguas, and Chiclayo and eight regional service laboratories located at Cuzco, Huarez, Arequipa, Cajamarca, Tarapoto, Tingo Maria, Huancayo and Puno. The service laboratories are designed to perform diagnostic soil fertility tests and plant analysis.

Five RRCs were programmed in the AID project to provide research support for the respective NPPs. These five centers have been established and their locations coincide with specific CIPAs where the respective NPPs are headquartered. These are within regions of the country where the individual target crops are dominant in the local agricultural system. The locations of RRC headquarter stations and associated CIPAs are shown in Table 4.

It will be noted from Table 4 that some commodity research programs are centered at two locations as governed by the predominant crop-cultural system in the region. Visits by the evaluation team were made to all RRCs except rice at Chiclayo and soft corn at Cajamarca.

The respective number of researchers in Table 4 includes all those assigned to the commodity program nation-wide. One anomaly exists in the distribution of researchers among the RRCs: at Andenes, the RRC for small grains, there are only two researchers working on small grains out

TABLE 4

National Production Program Headquarters, Associated Regional Research Centers
and Satellite Research Sites, and IEE Professional Staff

NPP	Location	Associated CIPA	RRC Headquarter Station	Satellite ¹ Research Stations	National Staff		
					Researchers	Extension	
						Specialists	Agents
Rice	Chiclayo (coastal region)	II	Vista Florida	16	47	12	57
Rice	Tarapoto (Selva region)	X	El Porvenir				
Potato	Huancayo	XII	Santa Ana	23	32	26	78
Corn (hard dent)	Tarapoto	X	El Porvenir	28	33	18	96
Corn (soft)	Cajamarca	IX	Cajamarca				
Small Grains	Cuzco	XIV	Andenes	13	23	7	51
Grain Legumes	Chincha	VI	Chincha	25	48	10	57

¹ Summarized from Appendix C. Includes some main stations for one commodity that are serving as sub-stations for other commodities.

of twenty-three nationwide. On the other hand, the potato and corn sub-programs at Andenes have four researchers each. The evidence indicates that the INIPA research commitment to the small grains NPP is still evolving.

The number of NPPs being implemented in each of the 18 CIPAs ranges from two to five as determined by the significance of given crops within the CIPA area. As an example, the rice NPP is not found in the Sierra. INIPA provides for communication of research results from a given RRC to all CIPAs where the associated NPP is applicable.

It should be noted that whereas Integral REE Program funding covers the NPPs and associated RRCs, the experiment stations receive funding from other sources to cover a much wider range of agricultural research activities. Examples of some of these noted by the review team were:

El Porvenir - pastures, dairy, beef, and tropical fruits

Santa Ana - small animals (rabbit, guinea pig), pastures, forage

Chincha - cotton, grapes

Andenes - quinoa, dairy cattle, alpaca, sheep, cacao, coffee
(Andenes is principally a sierra research center but since part of Huancayo lies in the upper selva some tropical crops research is administered here.)

Technical assistance is given to every RRC/NPP from the IARCs. The Tropical Soils, and Small Ruminants CRSPs also contribute. This assistance takes two forms. First, a representative of the IARC serves as Co-Leader (under World Bank funding) in the NPP. This Co-Leader provides continuous liaison between the IARC and the INIPA NPP. Second, the IARC supplies crop breeding lines and cultivars for local evaluation and selection. Furthermore, they provide comprehensive technical backstopping and training to the NPPs. Training is carried out at IARC headquarters, and IARC advisors assist INIPA in short-term training courses in Peru.

Objectives pursued in the variety programs include, in addition to high yield, resistance or tolerance to diseases, insects, frost (high elevation crops), aluminum toxicity (selva crops), as well as photoperiod adaptation and quality appeal to local tastes. It should be pointed out that factors other than genetic potential (such as soil fertility and moisture control, weed control, and certain diseases and insects) receive much less emphasis in outreach activities of the IARCs. These kinds of research must be designed and implemented by the RRC (see part D.8 below for an amplification of this point).

3. INIPA Research Management

Research management or direction in INIPA is exercised at two levels. Research policy and strategy is fixed at the national level as exemplified by the selection of crops to be emphasized in the NPPs and the assignment of NPP leadership to particular RRCs. On the other hand, research tactics, as exemplified by scientific objectives and methodology, are decided at the local level. In an important sense therefore research within INIPA is very much decentralized. This is to be encouraged as a means of developing personal initiative and independent scientific performance. Nevertheless, it also implies or requires an adequate level of training and experience by the CIPA Director. It is evident also that tactical direction from Lima on diverse research topics and under diverse ambient conditions would not be feasible even for the most experienced researcher. At the tactical level there is a CIPA Director, NPP Leader and Co-Leader and Experiment Station Director.

The division of labor between these director positions is very clear in theory. The CIPA Director has administrative responsibility; the NPP Leader has technical responsibility; and the Experiment Station Director and his staff are the executors of research. In actual practice, however, the division of labor and responsibility among these authorities is not clear and seems to vary among NPPs and RRCs. Evidently, inputs of individual directors are related to their maturity, experience, and level of training. In its present state of development INIPA is a very young organization. It is expected that the quality of research guidance and support will vary considerably among NPPs until experience and research skills are at a uniformly mature level.

4. Research Facilities

Research facilities at all RRCs include some laboratories and greenhouses but most research activities are in the field. Field research is done on-station at the main station and also at sub-stations. The latter range from two to five among the RRCs and are distributed across each NPP area. On-station research is overwhelmingly related to crop improvement including screening trials, plant breeding and seed multiplication for farmer distribution.

The amount of off-station research, i.e., experiments located on private farms, varies from fairly modest amounts in some RRCs to some fairly extensive and sophisticated field experiments in others. Off-station research is a prerequisite for developing information on soil management (fertility, moisture, tillage, etc.) and for several kinds of weed, disease and insect studies.

The relative proportion of an experiment station's program conducted off-station is one indicator of the comprehensiveness of its overall program. Based on this indicator, the RRCs varied from poor to very good.

5. Quality of Research

The present quality of research at the different stations is intimately related to the technical assistance being provided. As indicated previously, the IARCs supply breeding lines and cultivars used in breeding and screening trials. In general, this kind of research is fairly intensive and it is evident that rapid progress is being made at nearly all RRCs with respect to crop variety improvement. Quality of research outputs on all crop growth factors other than genetic potential is difficult to assess because INIPA is too young and the research programs too new. Not enough time has elapsed to allow for the preparation of research reports. As one example, the annual research progress report for 1983, the first full-scale year for the overall program, was not available at any RRC for the evaluation team's perusal. The NPPs are much too immature to expect any definitive scientific reports of research accomplishments. Limited insights into forthcoming reports are available in some recommendations being relayed orally to extension workers. Early indications are that experimental design, analysis, and interpretation of results are badly in need of critical review. There also is a clear need to strengthen the capacity for experimental design, and to develop improved computational capacity for analysis of data.

Three examples will illustrate the point. First, general recommendations were made for 30-40 kg N/ha for dry edible bean production in an arid zone. Second, 180N, 180P₂O₅ and 180K₂O as kg/ha were being recommended for potatoes in a sub-humid zone. It is highly unlikely that either of these are optimal recommendations either in terms of gross yield or economic returns. No actual research data were provided as background for these recommendations. Third, a 2X3X3 incomplete factorial (seven N-P-K fertilizer combinations) experiment was conducted on irrigated potatoes in the arid zone. The results were analyzed and interpreted to show that K fertilizer gave a yield increase. Close inspection of the data, which were presented in poster form, indicated that in fact there was no response to either N, P, or K. Practically speaking, the experiment yielded no information. The indications are clear: research direction at the tactical level is needed as well as peer review of technical reports of experimental results to assure quality control of experimental design, and analysis and interpretation of research results.

6. Need for Written Research Reports

The role of report writing in preserving and transferring research results needs more emphasis. This includes the entire gamut from the inception of a research project to its termination. Additional help should be given at the tactical level on preparation of project proposals, project outlines; detailed plans of work and comprehensive annual or more frequent progress reports (some progress is being made for

the 1984 campaign--see below). The latter serves as a communication link between the researcher and his directors.

The comprehensive research report, an internal station document, is the foundation upon which technical and semi-technical publications are based. INIPA should work toward more and better quality written reports which should include two or more of the following as part of the project plan of work: technical journal articles and experiment station bulletins both of which are subject to peer review; or experiment station circulars and folders for quick release of intermediate project results. The latter could include popularized (newspaper) articles. All items prepared for direct public consumption might be co-authored with the extension counterpart. Extension specialists have access to technical reports from which they prepare extension circular and leaflets. These extension publications may or may not be co-authored by the researcher. In any case the original source of the extension information is well documented.

Significant planning has been carried out by INIPA with NCSU assistance to strengthen written reports. For example, INIPA's Plan Operativo for 1984 sets up the format for reporting every research and extension activity that is to be conducted in a CIPA. This is just now in the process of implementation.

7. National Research Support Unit

The National Research Support Unit has not been developed as of the date of this evaluation and there are no concrete plans to do so. The team believes the Unit can play an important role in facilitating research and that it should be supported and developed.

8. INIPA and the International Research Centers

A significant amount of the research currently being done by INIPA is transferred by the international research centers (IARCs) CIMMYT, CIAT, and CIP and implemented with their technical assistance. The IARCs have specific impacts on the nature of the research carried out by INIPA both in terms of research objectives and methodologies. Because of the far-reaching influence of the IARCs, it would be well to outline specifically what they do and what they do not do in the information development and transfer process.

The IARCs are first and foremost germ plasm banks that emphasize research on genetic improvements for specific crop types. Part of their outreach function is performed by sending breeding lines or cultivars to a collaborator in a developing country. The breeding lines and cultivars are screened under local ambient conditions and selections are made based, for example, on disease resistance, length of growing season, photoperiod, and, ultimately, consumer preference. The IARCs frequently provide back-up support in the form of suggestions for field plot design,

size of plot, number of replications, sampling method, and the analysis and interpretation of the results. The IARCs give some guidance on soil and crop cultural practices such as pest and disease control and fertilization and in introduction of small scale mechanization, although less emphasis is given to these latter topics.

Frequently breeding lines are selected for return to the IARC where further genetic mixing is performed for development of specific combinations of crop characteristics. The overall thrust leads to selection of locally screened lines for field trials on farms and for seed multiplication for general distribution.

As indicated, suggestions on management factors other than variety selection come from the IARCs in general terms and there is less actual research emphasis on these factors. Indeed, the IARCs cannot be expected to take responsibility for some kinds of investigations because of the need to study each locality (soil/climatic-regime) as a unique system. Accordingly, the burden of research on management factors other than variety selection must be recognized and assumed by INIPA. In general, the concept of interaction as it relates to plant growth factors needs to be investigated under site specific conditions. For example, it is general knowledge that corn requires nitrogen and soil moisture for growth and development. Research which is designed to prove that nitrogen and water are indeed vital should be avoided. On the other hand, research should be designed and implemented that elaborates on the interactions among these growth factors and which shows the optimum combination of soil fertility and soil moisture levels together with the methods of controlling these levels for best crop performance.

When management factors are fine tuned or precisely controlled, the genetic potential of the crop, which may have been high for general farming conditions, may be challenged. Thus, studies on interactions among all of the crop growth factors including genetic potential are justified.

9. Research, the National Agrarian University, and the REE System

INIPA is not a self-regenerating system in the sense that it must "go outside" to recruit agricultural professionals to staff its research and extension positions. On the other hand, on-going research conducted by faculty at UNA is indispensable if these teachers are to establish themselves as leaders in science and resource development, and also to train students who are bona fide scientists. Some research is being conducted by UNA faculty, but the level of financial support needs to be increased and coordination improved with the RRCs and NPPs.

The UNA (and to a lesser extent other public and private universities) is developing agricultural expertise at a limited pace. There is a need to fortify and expand the capability of the UNA and other selected universities to raise them to the level of efficiency needed to meet Peru's needs. Since science and technology development depend on

and also fortify education, the universities must be integrated more explicitly into the national REE system.

The present scholarship (beca) program within the Integral REE Program is a significant step in the right direction. It supports graduate students and faculty advisors in the research programs needed for the Master of Science degree.

10. INIPA and Irrigation Department

INIPA does not include soil and water management (irrigation and drainage) in any of its research programs except in a very casual way. This is one of the weaknesses of a commodity research orientation because the commodity tends to be researched en vacuo rather than as part of a farming system.

The MAF supports a Department of Water, Soils and Irrigation (DGASI) and an Institute for the Expansion of the Agricultural Frontier (CINAF), both of which in recent years have carried on some on-farm water management studies including the agronomic aspects of irrigated crop production. In addition, the National Office for the Evaluation of Natural Resources (ONERN) has responsibility in the area of water resources.

INIPA did not exist when the on-farm water management work was being done. It is not certain that DGASI would have been collaborative in irrigated crop research and demonstration even if INIPA had been viable at the time since historically there was little interaction between predecessor agencies.

There is a critical shortage of information related to water resource development and on-farm water management in Peru. These factors loom large in the irrigated arid and sierra regions of Peru and also the paddy rice areas of the Selva. Irrigation, drainage and on-farm water management research and extension capability could be developed through a collaborative program conducted by UNA, DGASI, ONERN, and INAF with INIPA.

In this regard the Plan MERIS program funded by AID and the GOP may provide a basis for greater collaboration as it now focuses more on these important issues. The Plan MERIS includes water resource development in two provinces (Cajamarca and Tacna) through construction of storage reservoirs, diversion dams and canals. It also includes some on-farm water management, i.e. irrigated crop production, research and extension functions. Casual inspection by the review team indicates that the latter efforts are limited and somewhat marginal in effectiveness.

11. Extension and the NPPs

(a) Potatoes. The NPP in potatoes with its headquarters at CIPA XII seems to be the best organized and executed program. The participation

of researchers and extension specialists in carrying out field trials is a cooperative effort. The technological packages being prepared by the researchers and specialists are the most complete. Extension agents and para-professionals are being trained using research work both on and off the experiment station. Technological packages are further being modified by extension specialists and agents to fit individual areas as needed. It appears that some farmers have been reached by extension personnel with new technologies generated by this NPP. Examples also were cited of extension personnel learning from farmers.

(b) Rice. The NPP in rice with its National Headquarters in CIPA X (Selva rice) and CIPA II (coastal rice) has a very aggressive variety improvement program. However, the level of participation of extension specialists in the total program is below that of the potato program. The rice researcher is extending research information to individual farmers and his work is being used to train extension personnel. We reviewed the technical package prepared for the rice variety CICA 8 and found it to be quite complete. It is being widely distributed and its impact should be measurable in the next one or two crop cycles. The rice program is clearly reaching farmers and is producing the fastest returns in the form of increased yields and production of any of the programs.

The research work at the Experiment Sub-Station Nueva Cajamarca in Alto Mayo is being used to train extension personnel. The research work at the sub-station is being used more effectively by extension personnel than the work at El Porvenir Experiment Station near Tarapoto. Extension workers are directly working on field trials in cooperation with research personnel and are using result demonstrations very effectively with farmers. Farmers appear eager to receive the information being taken to them through various extension methods. A small number of farmers were contacted in CIPA X and they were using improved varieties (mainly CICA 8) and associated cultural practices. It is worth noting that a major effort is being made to introduce small mechanical equipment to reduce the large amount of hand labor currently needed to produce rice in a labor deficit area.

(c) Corn. The NPP in corn with its national headquarters in CIPA X (hard dent varieties) and CIPA IX (soft or flour varieties) is just beginning to generate information that Extension Personnel can transfer to farmers. A new hard dent corn variety, Marginal 28 Tropical, was released during our visit to the experiment station, but there was little evidence of extension specialist involvement in this program. The NPP in corn has, however, the largest number of extension workers of any NPP (Table 4).

(d) Edible Legumes. The grain legumes NPP with its national headquarters in CIPA VI probably is further behind than the others. There is a question about consumer acceptance of the bean varieties coming from CIAT. The researchers and extension specialists are working together, principally in beans to produce technological packages, and are working with farmers to produce basic seed.

(e) Small Grains. The NPP in small grains with its national headquarters in CIPA XIV is making some progress although there are many problems which still exist such as lack of personnel, vehicles, equipment, etc., in getting this program started. The work however, is well underway now and by September 1984 there should be a technological package for extension personnel to extend to farmers. Extension work is now being carried out within this NPP with producers in cooperation with researchers but technological packages are still being developed.

12. Demonstration Sites.

Five demonstration sites were part of the output to be established and operated in support of the NPPs (see Appendix A, Logical Framework Matrix). It was observed during our visits to the regional research centers that many more than five demonstration sites were established within the headquarter CIPAs as well as across other CIPAs (see Table 4 above). Demonstration sites provide a linkage between research and extension and the basis for informing farmers about new research developments. Training of specialists, extension agents and para-professionals is being done at these sites.

13. Farmers with Improved Production Technology.

The team observed several farmers using improved production technologies developed in the NPPs in rice and potatoes--a substantial achievement since the NPPs have been under implementation for little more than a year. Moreover, there is definitely a momentum in the NPPs and the team believes a relatively large number of farmers will begin to utilize improved varieties and production practices from the NPPs over the next 2-3 years, especially in rice, corn, potatoes, and small cereals. The numbers of farmers currently using improved technological packages developed under the NPPs are difficult to estimate but are believed to be modest. A system has not been implemented to obtain feedback so as to measure whether farmers are using the recommendations.

Table 5 lists the number of rice farmers contacted in CIPA X according to extension method and gives some idea of the magnitude of the extension effort.³

14. Overall Effectiveness of INIPA Extension.

The REE system has the beginning of an extension service that, when fully in place, should be capable of transferring the technology generated by the five NPPs. Adequately trained specialists at the Master of Science level, however, are not available in many critical positions. Extension agents also are not available for many extension positions that are crucial to the execution of the extension component. The transfer of technology has not reached the magnitude needed to increase substantially the national production of all five NPP commodities.

TABLE 5

Extension Contacts with Rice Farmers in CIPA X

Extension Methods	Number Conducted	Farmers Contacted
Methods demonstration	446	1,985
Meeting with farmers	61	1,140
Result demonstrations	40	40
Field days	21	<u>746</u>
		3,911

The preparation of technical reports or bulletins such as the one for Rice, CICA 8; and Corn, Marginal 28 Tropical are good examples to be emulated in other areas. However, there is still much to be done in this area.

Coordination of researchers with specialists and agents in extension appears to be good in at least two NPPs (potato and rice). To achieve an early and sustainable impact on production, this coordination of effort and priorities is especially important. Commodity and certain subject-matter specialists in extension should have a key role in this coordination because of their contribution of technical competence, training, supervision and evaluation.

Preliminary indications are that a substantial impact can be made in production of potatoes, rice, corn, and small grains in the very near future. Production of foundation seed by collaborating farmers was observed in Selva rice, hard dent corn, and potatoes, with concrete plans for seed multiplication in the NPPs, which will permit a modest expansion in production in the next crop cycle. This will result in a reduction in imports, and a more stable supply of food products for the urban population. Statistics on domestic production are not available to cover 1983, which is the first year that the national production packages were implemented.

One constraint that farmers generally mentioned when asked about using the new technologies was lack of credit. Another was the availability of seed for the new varieties being recommended. These types of constraints will have to be reduced if farmers are to be receptive to the new production technologies. Farmers appear eager to

learn, and the technological packages being developed appear to be appropriate for small farmers.

15. Special Problems with Extension.

Many vacancies exist at the extension specialist level since Ing. Agronomos assigned as extension specialists are reportedly paid a lower wage than for research positions so it is very difficult to fill the extension specialists positions with qualified people.

The salary differential needs to be eliminated and personnel at the specialist level need to be assigned and trained to work closely with their counterparts in research in order to improve the quality of training being given to extension personnel (the extension specialist is a critical linkage between research and extension). This will in turn improve the recommendations being made to farmers. The supervision of extension work at the CIPA level needs to be improved. The feedback from producers to extension and on to research occurs only in a few cases.

Present salary schedules of INIPA recognize the difficult assignment and working conditions of agents but do not recognize special qualifications or responsibilities of specialists and supervisors of extension. As a result there is a salary disincentive to specialists and supervisors in comparison with agents. This has resulted in some specialists being permitted to retain agent status, sometimes actually dividing their efforts between the two positions.

Specialists and supervisors have reported frustration with the transportation and general support received at the CIPA level. Participation of specialists in joint extension/research activities (verification plots, field days) is sometimes less than enthusiastic. Responsibilities of both specialists and supervisors in program planning and supervision appear to be poorly defined.

Substantial improvement in effectiveness of these two staff categories, in conjunction with proper functioning of zonal directors, is urgently needed.

16. Regional Service Laboratories

The project output called for six Regional Service Laboratories (RSLs). This has been expanded into a National Program (NP) with eight Regional Laboratories, three Central Service Laboratories and a National Training Laboratory at UNA.

Regional Service Laboratories are not in place at this time, but most of the new equipment is now in the country. Facilities are being prepared to house these laboratories at certain CIPA headquarters. The training laboratory is set up at UNA and was being used during this evaluation to train the technicians to operate all 8 RSLs and the 3

Central Laboratories. The laboratories are to be staffed with 19 specialists and 27 lab technicians, according to present plans.

17. Training and Visit System

The Training and Visit (T & V) system is an extension system that requires certain inputs be in place to function properly. Those inputs are personnel, transportation, equipment, and technological packages. The T & V system has interrelated components that make up the total system. There are some systems being called T & V that do not have all of the major components, and therefore are not legitimate T & V systems. The distinctive components of T & V that separate it from other extension systems are: direct line of supervision and training, fixed schedule of visits to contact leaders (model farmers), and closely supervised feedback and evaluation.

INIPA had adopted T & V as its extension model, but attempts to implement the approach have not been successful. In actual practice, INIPA extension is not structured using a direct line of supervision and training. The other major components of T & V are being followed only to a limited degree. CIPA directors and extension personnel have been very pragmatic in adapting the T & V system to the realities of Peruvian agriculture. In essence, T & V is not being utilized per se, and does not provide an appropriate model for INIPA to follow except, perhaps, for the North Coast area.

18. Agribusiness

There is currently no concerted effort to interact with the private agricultural service sector. There have been some contacts made with agribusiness firms that could develop into a working relationship. Agribusiness is involved in extension work as a regular part of every day business.

19. The Center for Audio-Visual Training

CESPAC (Centro De Servicios De Pedagogia Audiovisual Para La Capacitacion) is a special project of the MAF that was formed in June, 1981. Its function is to provide communication services, such as video tape cassette training packages, for organizations involved in agriculture. They are funded through the MAF, FAO, Government of Switzerland and service sales. Their technical capability is very high.

INIPA should consider contracting with CESPAC to assist with training of extension workers and for developing training materials for use with farmers.

20. Extension Teleconference System

An extension telecommunication project of ENTEL (Empresa Nacional De Telecomunicaciones Del Peru S.A.) with headquarters in Tarapoto has just started to function. This telephone conference system now has units in nine sites in the interior of Peru, plus a unit in Lima. This system has considerable potential as a training vehicle, if prior preparations are adequate. INIPA should collaborate closely with ENTEL and if the system proves to be cost effective, seek ways and means of adapting it to serve extension needs nationwide.

21. Quantitative Indicators of Research and Extension

The foregoing discussion of research and extension is summarized in Table 6 in which numerical values ranging from 1 (lowest) to 5 (highest) are assigned to certain factors in each of the NPPs. The order of presentation of the factors coincides with the discussion. This order, as indicated previously, contains no connotation as to ranking or priority among the factors.

Individual observations in Table 6 are clearly judgemental. It is believed, however, that errors of judgement are minimized in the matrix column and row totals. The relative standings of the individual NPPs, as reflected in the column totals, show that the potato program is strongest, followed closely by rice. The grain legume program is quite clearly the weakest. It is evident that a research management decision at the strategic level is called for: Is there a need to increase program inputs at some points to give them more technical backing, or would it be prudent to shift resources away from the less efficient programs for purposes of developing new national programs or to fortify those that are producing acceptable results?

With regard to row totals, which reflect the individual factors, the IARC technical assistance is most prominent. On the other end of the scale, research reporting is very weak and this is reflected in the technical packages. The technical packages could not be evaluated in detail because of lack of supporting documentation, both for the packages themselves and the research on which they were based. The integrated REE system will remain immature until the technology development and transfer process advances beyond oral dialogue.

The low status of the technical capability of the extension personnel in Table 6 reflects the training and professional development issues which have been emphasized repeatedly.

It was noted earlier that INIPA is a young and growing organization. It is highly probable that the elements of Table 6 will improve markedly during the next 18 to 24 months.

TABLE 6
 QUANTITATIVE EVALUATION OF OVERALL RESEARCH &
 EXTENSION SYSTEM IN INIPA

Evaluation Factor	National Production Program					
	Potato	Corn	Small Grains	Rice	Edible Legumes	Total (max=25)
Research outside of NPP target crop	4	4	4	4	2	18
INIPA commitment to NPP/RRC	4	3	2	4	3	16
Quality of TA from IARCs	5	4	4	5	2	20
Research facilities	3	3	1	3	1	11
Scientific capability of researchers	4	2	2	3	2	13
Research reporting	2	1	2	1	1	7
Research/extension collaboration	3	2	3	3	2	13
Improved technology packages	3	2	2	3	1	11
Demonstration sites utilized	5	4	3	5	2	19
Technical capability of extension personnel	3	2	1	3	1	10
Total (maximum = 50)	36	27	24	34	17	--

E. The Education Program, and Training in Support of Research and Extension

The AID project called for an Education Program to provide the institutional capacity to generate the human capital required for productive agricultural research, extension, and education institutions. Substantial resources for graduate-level and short-term training also were included in the REE project design. The existence of an on-going training program was specified in the logical framework as one of the indicators that the end-of-project status expected in the Education Program had been achieved. Progress in developing an education institutional capacity as well as the amount of training to date is described below.

1. Inputs to the Education Program

A total of \$585,000 in AID and \$242,000 in GOP funds were budgeted under the Education Program, exclusive of NCSU technical assistance. A major portion of this was intended to support the institutional capacity for graduate training at UNA. Amounts budgeted for facilities improvement, training equipment, library support, in-country training support, salary incentives, foreign training, and other salaries and facilities are shown in Table 7. While AID accounting procedures do not allow an exact accounting of expenditures by detailed line item, the amounts expended for foreign graduate training appears to be roughly on target for the second year of the project with four people in Ph.D. programs in the United States and one in Mexico. Money for facilities improvement, training equipment and support, and library support have not been spent since they were reprogrammed in INIPA's Integral REE Program to be provided via a separate World Bank Loan to UNA. Salary incentives to UNA faculty from AID's project have just recently started to flow on the same basis as provided to INIPA personnel.

On the technical assistance side, the position of long-term Education Program Leader position was never filled. The project was amended recently to allow substitution of an agricultural economist for the long-term education position. One short-term person (approximately seven months per year) has been provided by NCSU to coordinate post graduate training and a second short-term person provided to advise on training in relation to extension needs.

2. Training Inputs to the Research and Extension Program

A total of \$1,782,000 in AID and \$400,000 in GOP funds were budgeted for graduate level and short-term training as inputs in support of the Research and Extension Programs (see Table 8). Unfortunately, expenditure data were not available from AID or INIPA on training as an input to Research, Education, and Extension Programs, or the Management Unit. A total of 2,000 person/months of training (both short and long

TABLE 7

Amounts Budgeted for Education Program
in REE Project Paper (In Thousands of U.S. Dollars)

Item	AID Funds	GOP Funds	Total
Facility Improvement	20	10	30
Training Equipment	40	10	50
Library Support	95	12	107
Training Support	90	60	150
Salary Incentive	100	20	120
Foreign Training	240	30	270
Salaries and Facilities	<u>---</u>	<u>100</u>	<u>100</u>
Total	585	242	827

term) were programmed in the project paper including 40 people at the M.S. level at La Molina and 180 person/months of foreign training. There are currently 40 INIPA people at UNA working toward masters degrees under the AID project. Twenty people began their programs in April of 1982 and another 22 in the fall of 1983. Two of the first group have dropped out. One INIPA person is currently in a Ph.D. program in the United States (with four more slated to go) and an additional six people have undergone short courses at international centers.

A significant amount of short-term training appears to have occurred within INIPA under the REE project. In addition, World Bank, and BID monies have been used, particularly for T & V training of sectoristas. For example, 32 courses for 1,191 professional extensionists were held in 1982 and 21 courses for 630 extensionists in 1983. An administrative training course was financed by the World Bank in 1982. Other training utilized UNA faculty members at CIPAs. For example, four soils training courses of two weeks each were given by UNA in 1983. Courses also were held in integrated pest management. While detailed accounting of short-term training under the REE project was not possible due to the lack of summarized results, information provided by INIPA indicated that 73 training "events" were held in 1982 for 3,016 technical personnel from all sources of funds. Summary numbers for 1983 are not yet available. Sectoristas also receive some training. Four months of short-term technical assistance has been provided under the REE project for short training courses for research and extension personnel.

TABLE 8

Amount Budgeted for Training Inputs
to the Extension and Research Programs
in REE Project Paper (In thousands of U.S. Dollars)

Item	AID Funds	GOP Funds	Total
<u>Extension Program</u>			
National Production Program Personnel Training	1,200	120	1,320
Regional Service Laboratory Personnel Training	90	100	190
<u>Research Program</u>			
Regional Research Center Personnel Training	252	150	402
National Research Support Unit Foreign Training	<u>240</u>	<u>30</u>	<u>270</u>
Total	2,367	642	3,009

A training course was held during January 1984 for laboratory personnel with 34 participants. The training implementation plan for 1984 has not yet been released but preliminary documents list several short courses which were decided upon following a survey of extension and research personnel to assess training needs. For example, under the national rice program, four courses will be held: 1 on rice production under dryland conditions for 16 participants, 2 on irrigated rice production for 35 participants, and 1 on seed technology for 20 participants. Similar numbers and kinds of courses are planned for the other NPPs.

3. Progress in Achieving Purpose

For a variety of reasons, the Education Program has not received the concentrated effort that Research and Extension Programs have in the Integral REE Program. The fact that there has not been a long-term Education Program Leader and the lack of support for the library,

equipment, facilities improvement, and delays in providing salary supplements to the UNA faculty indicate the lack of attention devoted to the Education Program. Students are being trained, but it is not yet evident that the capacity to sustain on-going, quality educational programs has been achieved.

The process of institutionalizing a working relationship between UNA and INIPA is at a rudimentary state albeit in a current positive climate. The AID PP calls for close coordination between UNA and INIPA in the education area in order to develop an integrated REE system. The limited success to date can be attributed in part to past differences of opinion between UNA and INIPA, although the mechanism for obtaining this coordination may have been poorly conceived from the beginning. A coordinating committee comprised of UNA and INIPA representatives was organized but has ceased to function. Also, the lack of NCSU's long-term education advisor reduced the chances for coordination and communication, both with respect to program content and administration.

Development of a cadre of well trained agricultural scientists is crucial if Peru is to acquire the ability to sustain on-going training programs which can be adjusted as conditions warrant. Graduate students currently receiving M.S. training at UNA and Ph.D. training in other countries eventually may provide a nucleus of trained people to provide on-going training. There is some concern, however, that insufficient numbers of Ph.D. students are being trained to rebuild the quality of the faculty at UNA and fill key research and extension positions in INIPA. Five persons are receiving Ph.D. training abroad who are on the UNA faculty. Another five were to have been selected from INIPA but thus far only one has gone. It has been difficult to find people to send for this type of training because of inadequate academic preparation, the need for English, and because many of the best candidates are currently in key positions which makes their release difficult. Currently only four people employed within INIPA have Ph.D.s. This, given the size of Peru, its large number of farmers and its agro-ecological diversity, is by any international standard very low.

Selection of students to undergo M.S. training in the first year was based on CIPA director recommendations and there are indications that the best candidates were not necessarily selected. In the second year, criteria were developed by educational advisors to the NCSU project, candidates submitted credentials, and 22 students were selected out of 76 applicants. The role played by NCSU in improving the selection process should increase the likelihood that the best talent is being trained. Most of the students who entered M.S. training at UNA had to take remedial courses the first semester, which has delayed their progress in the program. Virtually all of these students received their undergraduate degrees at regional universities which suggests a need to strengthen the faculty and undergraduate programs at those institutions. UNA and INIPA also will have to work out an arrangement to allow the students currently undergoing masters training more than two years to finish their degrees.

NCSU has helped design the salary supplement schedule for professors. About one quarter of the professors at UNA receive these supplements. Even with the supplements, salaries remain very low in the university system, forcing many professors to devote part time to other jobs. This may be detracting from the quality and quantity of professor-student interactions, reducing the quality of the M.S. degree. Some students interviewed at UNA, however, praised the close degree of such interactions. Professors at UNA indicated that lack of research support, especially for travel, reduced their ability to adequately coordinate with NPPs in supervising students' theses. Some of these problems may be partially resolved by an INIPA/UNA Letter of Intent under which major professors have started to receive funding support for travel and a limited amount of research relative to M.S. students thesis projects in the NPPs.

Another serious problem looms in the future because of the low faculty salaries. Persons with graduate training, especially Ph.D.s, are relatively mobile and low salaries may result in persons trained under the REE project moving into private industry or to other countries. In fact, a number of Peruvians trained during the sixties and seventies who are currently working outside the REE system could be attracted back to agricultural research, extension, and education in Peru if salaries were raised.

Students supported by the REE project at UNA are working on thesis problems identified through discussions with INIPA (see Appendix E for a list of thesis topics). It has not proven to be an easy task to coordinate research topics of M.S. students at UNA with the needs of the national programs. NCSU has facilitated that process but a long-term education advisor might have been beneficial in this respect.

There is some question whether the curriculum at UNA is adequately structured to provide students with the information and tools needed to solve practical research and extension problems they will experience in the field. NCSU education advisors are working to improve the content of the program.

In-service training on the REE project is difficult to assess at this time since a relatively small amount of training was programmed for 1982 and the results for 1983 have not been summarized and evaluated. A major boost was provided to the in-service training component of INIPA by World Bank and especially by BID monies. Clearly the training of sectoristas, however, is suffering from the limited number of packages of improved technologies.

Training plans are prepared on an annual basis. The plan prepared for the first year (1982) also contained information for years two to five.⁴ It was prepared prior to the NCSU technical assistance component, but laid the groundwork for subsequent training programs. It lists topical areas and targets for numbers of courses and participants. Objectives in the plan were very general and stated in terms of increasing the technical competence of the people trained. The topical

areas identified for both short and long-term training appear reasonable. It is not clear how they were determined, but it appears that an effort was made to obtain training on a wide mix of agricultural disciplines and topics.

During the past year a survey of technical personnel was conducted to help determine future training needs. The results of the survey, however, have not yet been used to develop a detailed training plan for future years.

4. Complementary Resources for the Education Program

There are two proposed projects--one AID, and the other World Bank funded--which should substantially strengthen the Education elements of Peru's REE system. The World Bank project is a loan of \$18.0 million which will provide support to UNA for the kinds of inputs originally proposed in the AID project (library acquisitions, operations budget, vehicles, etc.). The AID support is one of five components of a \$17.0 million loan and grant project entitled Agricultural Planning and Institutional Development (APID). One element of the APID project provides for technical assistance to UNA from a Title XII University. This project will clearly support and strengthen the relatively weak Education Program of AID's REE project and is clearly needed and justified. We are concerned, however, that procurement of another Title XII university for the UNA element of the APID project will: (a) pose an unnecessary administrative burden on UNA and INIPA; and (b) not lead, necessarily, to stronger linkages between UNA and INIPA, and hence not result in a greater degree of integration of education with research and extension. The most pragmatic approach may be to amend the REE project to include the (APID) element for UNA, with NCSU to provide the technical assistance, which would address both these concerns.

F. National REE Management/Administration

It is not possible to follow the AID logical framework to discuss the subject of national REE Management. There is no way to identify quantifiable inputs and outputs to assess progress made in achieving project purpose with respect to management. We will thus focus this section on a general assessment of the current status of the national REE management unit, and on answering some of the questions asked in Articles III.B.2.d and III.B.3 of the evaluation's Scope of Work (see Appendix A).

1. The National REE Management Unit

The AID project paper states that a key element of the project is the creation of a National REE Management Unit to direct all activities included in the REE system. This unit was to be located in Lima and

comprised of various institutions within the agricultural sector and the Universities.

The project paper does not describe the nature of the REE Management Unit, but the contract with NCSU refers briefly to its composition. The unit was to have a Directive Committee composed of the Chief of INIPA, the two Executive Directors and the NCSU Chief of Party (Ex-Officio). It also refers to a coordinating committee composed as follows:

- a. One representative of the Chief of INIPA
- b. One representative of the Executive Director of research of INIPA
- c. One representative of the Executive Director of Promotion of INIPA
- d. One representative of INIPA for Education
- e. One representative of UNA for Education and
- f. NCSU's Chief of Party, Ex-Officio

At the time of this mid-term evaluation a comprehensive REE Management Unit has not been implemented. INIPA integrates a large part of the agricultural research and extension carried out in the country. Consequently a built-in research-extension management system is taking place within this institution. With the exception of the Universidad Nacional Agraria (UNA), and the Universidad Pedro Ruiz Gallo in Lambayeque, very few universities in Peru are doing any kind of significant agricultural research pertinent to the REE project.

The UNA is providing graduate training to INIPA professionals, but it is not participating in the management of the other components. Furthermore the curricula of UNA's graduate school are naturally organized to satisfy the several academic goals of the university but not necessarily to satisfy the requirements of AID's project. The research programs of the University are focused on different objectives and goals, and only in some cases do these overlap with the goals of AID's project. If there is to be graduate training focused on the specific needs of the research and extension priorities as determined by AID's project, it is obvious that the UNA should have greater participation in the planning and decision-making process of the project. This could be facilitated by implementing an REE management unit where the Director of the Graduate School (Director del Programa Academico de Graduados) participates as an ex-officio member of the Directive Committee.

It is quite evident that an REE National Management Unit has not been implemented formally or informally. Part of this role has been carried out by the NCSU advisors, but its main focus and responsibility has been coordination within INIPA with little influence over UNA. The evaluation team was informed that the Management Unit was not implemented chiefly because of a lack of communication between the former authorities of INIPA and the University. Although there were initial discussions between these two institutions regarding the management from the REE project, a deadlock was reached when INIPA claimed complete managerial control of the project and UNA demanded authority over its education

component. Optimism has been expressed recently regarding the possibility of joint management efforts as a consequence of recent changes in the leadership of both institutions. Hopefully this will lead to the creation of better coordination and greater integration of INIPA and UNA programs. This would be highly desirable since it would contribute to the consolidation of a genuine research, extension and education system which has not yet been implemented.

2. Overall Administrative and Management Support Systems

The Evaluation Team was informed that monitoring is one of the significant bottlenecks encountered by the NCSU contract staff as well as by INIPA's management. This is particularly true at the CIPA level due to the high degree of autonomy of their Directors, and because of the difficulty in communicating between headquarters and the CIPA, and within the latter. Technical and financial monitoring should be improved significantly if the Unit of "Quantitative Methods and Systems Development" which INIPA's management is contemplating creating, gives highest priority to the development of computerized project and budget control systems as management tools.

3. Progress toward a Comprehensive Managerial Organization

a. The role of North Carolina State University. It is very clear that NCSU contract team has played a fundamental role in the conceptualization and implementation of a comprehensive management and administration system which integrates INIPA's own responsibilities with those of the various special projects (AID, BID, World Bank). This is evidence of a great deal of flexibility and foresight, permitting the adaptation of the original design of the AID-funded REE project into its present role in programmatic and administrative integration, a role that has been accepted and welcomed by the other donors. From an administrative point of view, this is undoubtedly a significant achievement.

The impact of the NCSU contract team has been enhanced and facilitated by the decision of the previous Director of INIPA to integrate the responsibilities of the three long-term scientists into the administration of the Institute. He did not want "advisors" but people that would be involved in the daily decision-making process of INIPA. Thus, the Chief of Party was appointed as Associate Technical Chief, and the Extension and Research Program Leaders were appointed respectively as Associate Director of Extension and Associate Director of Research. These executive roles have given to the NCSU long-term staff greater integration and commitment to INIPA and, undoubtedly, a more significant impact.

From a management perspective, an undesirable factor in the implementation of the NCSU role has been the relatively high turn-over of the long-term personnel, the late arrival of the Chief of Party and

research and extension advisors, and the absence of an education program advisor.

b. The role of the International Agricultural Research Centers (IARCs). Although most of the impact of the IARCs in the REE project is directly in the areas of research, extension, and training; they also are playing an important role in management. The three IARCs located in Latin America (CIAT, CIMMYT, and CIP) participated actively in the preparation of the base documents that laid down the organization and strategy of the five NPPs. It was evident to the evaluation team that the co-leaders of these programs, appointed by the respective IARCs, are providing a significant leadership role and are well accepted by their Peruvian colleagues. Although the co-leaders are funded by the World Bank project, they are clearly working on a national level, and not restricted to the five CIPAs located in the Northwest, for which the World Bank project has special responsibility.

In addition to the administrative roles mentioned above, the International Potato Center (CIP) is sponsoring under the auspices of the GOP-CIP Agreement those scientists from the sister centers appointed as co-leaders of the NPPs, the present Chief of Party of the NCSU team, as well as all the foreign staff of the Tropical Soils and Small Ruminants CRSP. This collaboration from CIP provides the official status of these advisors in Peru on a long-term basis, as well as for the importation of their personal belongings and assigned vehicles. This service was requested of CIP by the Chief of INIPA and has been provided on an ad hoc basis to this point. The Minister of Agriculture has requested the Minister of Foreign Affairs to permit CIP to provide this service to INIPA on a regular basis but this has not yet been approved. CIP needs formal approval to continue its sponsorship of foreign scientists not directly working on CIP programs.

4. Administration and Management in INIPA⁵

The Chief of INIPA has changed recently (October 1983), the Deputy Chief was appointed in January 1983, and new Executive Directors of Research, and of Extension were appointed effective February 1, 1984. The Director of Administration is also a new person appointed as of January 1, 1984. Because of the recent nature of these appointments, it was not possible to determine the effectiveness of higher management of the Institute, although there is no doubt that the present Chief is a competent and effective administrator, and that the Deputy Chief has played a major role in helping to conceptualize the Integral REE program, in managing its implementation, and in providing stability during the transition from one Chief to another.

a. Administrative Structure. The Chief of INIPA has expressed to the evaluation team his concern about the present administrative structure of INIPA. He is in the process of introducing some important changes which will give more direct and clear responsibilities to the Deputy Chief and two Executive Directors and a more direct line of

command to the CIPAs. The present organizational structure does not provide direct authority of the Executive Directors of Research and Extension over their corresponding research and extension activities at the CIPA level, since the CIPA Directors report directly to the Chief of INIPA. The Chief of INIPA feels that himself, his Deputy Chief and the two Executive Directors should form a Jefatura (collegiate body) responsible for the management of the whole institute. The Chief of INIPA also mentioned his decision to put planning and budgeting functions more directly in the hands of higher management instead of in the staff level Planning Office.

The Team was informed by the Chief of INIPA that the administrative changes mentioned in the previous paragraph will be implemented by the creation of five units which will report directly to one or more members of the jefatura. These proposed units include:

1. Human Resources Management and Development
2. Management of Fiscal and Financial Resources
3. Quantitative Methods and Systems Development
4. Agroecconomics
5. International Cooperation

The areas of responsibility which will be assigned to these units are undoubtedly of considerable importance, and probably reflect the weakest points in the existing administrative structure. Nevertheless, the team is concerned with plans to have these proposed units report directly to the jefatura and especially to the Chief of the Institute.

Our principal concern is with the excessively large span of command of the Chief of INIPA. At the present, there are 26 people who report directly to him.⁶ From an administrative perspective, this is an inordinately high number. It might be better to locate some of the proposed new units under existing Offices or Directorates. For example, the units of Human Resource Management and Development, and of Management of Fiscal and Financial Resources could be placed under the Office of Administration. The units of Quantitative Methods and Systems Development, and of Agroecconomics could probably be created by upgrading the existing offices of Biometrics, and Agroecconomics, respectively.

Furthermore, the advantages of grouping the CIPAs on a geographical basis and placing them under the Executive Directors, which would then have a geographical responsibility, should be considered. A similar structure is currently being utilized by EMBRAPA in Brazil. This should lead to a more manageable span of command by the Chief and Deputy Chief of INIPA, and greater authority of the Executive Directors over the CIPAs. Again, our main point is that the four members of the jefatura need to have a manageable span of command--say 5-7 people reporting to

each of them--in any reorganization or creation of new units. The jefatura might consider as their joint function to set policy, goals, objectives and related guidelines.

b. Lack of Adequate Job Description. The Team noted that there are various positions at INIPA that have no clear job descriptions. For example, the position of Research and Extension Supervisors at the CIPA level are not clearly defined and do not appear in the organizational chart of the Institute. The Director of CIPA X mentioned that the position of Research Supervisor clearly overlaps with the Director of Research of the Experimental Station, thus creating a source of conflict. The organizational changes to be introduced shortly should be a good opportunity to attack these problems.

c. Budgeting and Rendering of Accounts. The budgeting process of INIPA is a complex one. The GOP requires extremely detailed budget headings and line items in formats which were not designed for extension or research purposes. Consequently, in many cases these headings or items do not reflect the nature of the actual expenditures. An enormous amount of time is spent in preparing budgets using these formats, as well as in transforming figures of actual expenditures to the "official" budget lines. Budget preparation tends to be inaccurate as there is a tendency to overbudget since the Ministry of Finance usually introduces severe cuts (not necessarily reflecting technical priorities). Furthermore, disbursements of operating funds are usually delayed and made towards the end of the year. These characteristic patterns make budgeting difficult, ineffective and inaccurate.

Budget preparation starts in the respective CIPA and is finalized by the Planning Office at Headquarters. At the CIPA level the budgeting and rendering of accounts falls within the responsibilities of the Director and the Administrative Office. This Office has an adequate structural organization and is formed by four Units: Accounting; Personnel; Supplies; and "Tramites Documentarios." The Accounting Unit is actually a Controllers Office with the responsibilities of assisting in the preparation of the budget, keeping accounts and rendering financial statements. The accounting procedures are dictated by the Central Government and there is very little flexibility to change them. (AID's new APID project, in its Agricultural Policy Component will provide one long-term advisor, and several person months of short term technical assistance to MAF's Office of Sectoral Planning, which may help diagnose problems with GOPs accounting procedures and help rationalize them). The budget is finalized at Headquarters in Lima under the direction of the Planning Office.

d. Liquidation of Advances. This is also a very difficult procedure, a consequence of the accounting requirements imposed by the detailed and inflexible budget headings mentioned above. Furthermore, AID requires liquidation of 65 percent of previous disbursements before new monies are advanced. Thus, INIPA requests disbursement for estimated expenditures for the following three months, but AID approves the request only if 65% of the previous advance has been expended. This requires a

significant amount of paperwork, but is probably a necessary evil to guarantee adequate and opportune control of project expenditures.

e. Insufficient Staff and Equipment. Team members had the opportunity of discussing accounting with the Administrator and his staff at Headquarters and at the CIPA X in Tarapoto. They complained about their staff limitations in this unit, aggravated by the fact they they have to keep separate accounts for the REE, World Bank and BID projects, as well as for GOP funds and other special projects. Furthermore, the turnover of their clerical staff is very high as they cannot compete with the salaries offered by industry, local banks, etc. The Administrator also complained of insufficient equipment; i.e.: typewriters and calculators. The Administrator at Tarapoto is looking forward to the installation of the Ohio Scientific computer which they already have but cannot use due to significant voltage variations and current interruptions (voltage stabilizers/batteries are to be installed shortly).

f. Need for Computing Facilities. It is evident that the requirements for rendering of accounts imposes a heavy load on INIPA's administration and that computers should simplify this task significantly. The team was told in Lima by the officers in charge of the computer facilities that INIPA has ordered one WANG BS 45 minicomputer for Headquarters and 25 micros for the CIPAs. Furthermore, they informed us that they will program their own accounting software in order to accomodate the accounting procedures and characteristics required by the Peruvian Government, and that this task should take them around six months. Knowing that excellent and versatile accounting programs are available, this may be an unnecessary effort, particularly under the present circumstances where there is a heavy demand and urgency for rendering of accounts and project control.

It was quite evident to the team that INIPA, at Headquarters and the CIPAs, need an effective computing system, to improve management and administration (accounting, budgeting, personnel, inventory) and analysis of research data. (Consequently this should be given high priority.) One of the problems of computing systems that are found in Peru is lack of adequate maintenance, particularly in the Provinces where electronics technicians (from WANG or other computer companies), are not available. INIPA should contemplate training a small cadre of electronics technicians specialized in the particular computer brand predominant in the Institute in order to provide adequate service to the computer network that will be established. The team was pleased to know that the scientist who organized the computer systems in Turrialba, Costa Rica, and in EMBRAPA, Brazil, will be shortly hired on a long-term contract to .pa provide leadership for the use of computers in scientific work, and in support services (such as accounting).

g. Commodity Procurements. Commodity procurement for the project is done through different routes depending on the nature of the items to be acquired. They are bought locally through the INIPA purchasing structure, through NCSU/Raleigh or using AID facilities. In general,

commodity procurement is slow either because the numerous bureaucratic requirements of the national system and AID, or due to the natural time lags that result from importing goods from abroad.

h. INIPA's Ability to Utilize the NCSU Contract Team Effectively. It is clear that INIPA is utilizing the contract team quite effectively. The first evidence of this was the decision by the former Director of the Institute to appoint the team members as associate staff. During the permanence of the evaluation team in Peru, it was quite evident that the contract team was fully integrated within INIPA's structure and were active participants in advising and assisting in the planning and decision-making process of the Institute. A good illustration of the adequate utilization by INIPA of the Contract Team is the recognition shown for their contributions to the INIPA program. This was done publicly by the field staff on various occasions during our trip to the jungle stations. Furthermore, the former Chief of Party was awarded with the "Orden del Merito Agricola" in recognition to his contribution to Peruvian agriculture.

i. INIPA's Ability to Coordinate Roles of Multiple Donors and other Institutions. The former leadership of INIPA insisted on an integrated program under the Institute, not separate AID, BID, and World Bank programs. This attitude was instrumental in the reorganization of AID's original REE project and in the consequent implementation of the other programs. Likewise, the former Chief's knowledge of the International Centers may have been an important element in conceptualizing and planning the important roles of the IARCs in the NPPs. During the period of this evaluation the coordination of roles of the various institutions involved was quite evident. The conspicuous exception was the weak linkage with the universities.

5. Adequacy of GOP Budgetary Support to INIPA

One of the issues which arose during our visits to INIPA, both at Headquarters and at the CIPAs, was the subject of insufficient counterpart funds available for the implementation of the various projects executed by INIPA. It was mentioned repeatedly that the severe austerity demanded by the International Monetary Fund made it almost impossible to satisfy the needs of the projects to the extent that was originally planned. It should be mentioned that in the case of the REE project, this problem has been partially solved through the use of GOP funds generated from sales of PL 480 commodities.

The team also noted that the salaries paid by INIPA are insufficient to attract and retain well-trained, capable agricultural professionals. The AID project is implementing a scheme of salary supplements for INIPA and UNA personnel participating in the project, and it is understood that loan funds assigned for these salary supplements will be gradually phased out with a concomitant increase in the counterpart contribution. Various INIPA officials with which the team discussed this issue expressed severe pessimism on the possibility of implementing this strategy under the

current financial conditions of the country. The effectiveness of INIPA in the long term will depend on the quality of its staff. It is therefore very important for the success of AIDs project and INIPA that the Government of Peru provides, as soon as possible, an adequate salary scale for agricultural professionals; a scale that will retain the staff presently being trained in Peru and abroad and, if possible, attract some of the numerous professionals that have left the country during the previous government. The importance of the agricultural sector to the economy of the country in maintaining social stability should more than justify this effort and the related investment.

It should be mentioned that INIPA's 1984 approved budget illustrates an apparent decision by the GOP to give higher priority to the agricultural sector. The headings for "goods" and "services" have been increased 131% and 162% respectively; figures which are higher than the actual inflation rate for 1983 (125%). This is of considerable importance since the inflationary increase authorized by the Ministry of Finance for the preparation of the 1984 budget was only 60%.

The situation with the hiring of personnel is different. Government agencies are not permitted to hire new staff. INIPA's office of Administration has lost 15 officers due to retirements, but cannot replace them. Paradoxically, INIPA cannot remove unwanted or unneeded personnel due to the existence of a Labor Stability Law.

6. INIPA's Ability to Tailor Research and Extension to the Agroclimatic and Socio Economic Conditions of the Country

The creation of only five commodity programs suggests a decision to establish firm priorities for the activities of INIPA. This takes into consideration the limited professional and financial resources of the country. Given the available supply of research results at the international centers; the importance of rice, corn, potatoes, beans, and cereals in the diet of low-income Peruvians; the large quantity of scarce foreign exchange being spent to import basic food commodities; and the need to focus research and extension on potentially high impact, quick-return areas, the selection of the five NPPs seems adequate. Rice, potatoes, and cereals are staple foods in Peru, and have significant social importance. There is presently a need to import rice and wheat. Beans and other grain legumes (menestras) have been traditionally popular foods and research and extension oriented towards increased production and availability of grain legumes is certainly a desirable priority.

From an agroclimatic and economic point of view the selection of national programs for rice, potatos, grain legumes (beans), and corn is reasonable. Furthermore, with the exception of rice, the andean region was the center of origin of these crops and the high jungle area offers excellent agroecological conditions for the growing of rice. The cereals program is another issue. Peru may not have a comparative advantage for producing wheat. The main justification for the inclusion of wheat in the cereals program appears to be the issue of national food security.

Also, wheat provides income and food for a large number of peasants of the highlands, and domestic wheat production results in savings of foreign exchange by reducing imports.

The adequate agroecological conditions of the jungle region, and the importance of livestock production in the highlands suggests the desirability of an INIPA pastures/livestock program. Nevertheless, the existence of expertise and organized research programs in this area in the universities may illustrate an intelligent decision not to duplicate efforts.

Unfortunately the avoidance of duplication of efforts was not evident with corn research. Since the early fifties UNA has had the leadership role with corn research and development. UNA's Programa de Maiz (corn program) has worked on a national level, and in close coordination with the private sector. Its impact has been felt primarily in the coast and sierra, but has also developed, in collaboration with CIMMYT, materials adequate for the selva. During a visit to the UNA it was evident to the team that the Programa de Maiz had excellent human and physical resources which were not being tapped by the Integral REE Program and the NPP for corn. The team was told that this was a consequence of friction between the previous leadership of INIPA and UNA discussed earlier in this chapter. It is clear that efforts should be made to integrate the INIPA and UNA corn Programs.

G. New Project Elements

The AID project paper placed little emphasis on the farm-household unit and the socio-economic factors which influence the acceptance of new technologies. It stressed five individual commodity programs and the development and dissemination of component technologies for those commodities. It has become evident to INIPA as well as the donor community, however, that a modest program of systems-oriented research, extension and education is essential even if REE priorities are placed on technical components for major commodities. Farming systems, particularly in the Sierra, are highly complex and must be understood if acceptable technologies are to be developed for farmers. In addition, many commodities in those systems are outside the national production programs. Furthermore, information is needed on costs of production, credit needs, marketing problems, etc., to feed into pricing, credit, and other policy decisions made by the Ministry of Agriculture which in turn influence the demand for new technologies. Three new NPs have been added to the REE project--an Agroecconomics Program, a Selva Program, and a Sierra Program--as a result of such considerations. The basic objectives and brief assessments of these NPs is provided below.

1. Agroeconomics Program

Some agroeconomic analyses--mostly cost of production and marketing case studies--were conducted within INIPA prior to the formal creation of the Agroeconomics Program which began work January 1, 1984. These studies lacked depth, however, and were seldom presented in a form which was useful for subsequent decision making. In 1983, NCSU and AID decided to convert the long-term education position, which was never filled, to an agricultural economics position, a candidate was interviewed in August 1983, and he began work in January 1984. A program document describing the Agroeconomics Program was written during 1983 and approved in November 1983.

The new Agroeconomic Program as described in the program document will concentrate on microeconomic analysis.⁷ Most of its effort will be devoted to analysis of production and marketing systems and farm businesses. Other efforts will be directed toward policy analysis and collaborating with the new policy analysis unit in the Ministry of Agriculture, supported by AID's APID project. A third area of work will involve disseminating information to farmers and coordinating with the National Agrarian Bank on a supervised credit program. According to the document, 1984 studies will be conducted to delineate agroclimatic zones in Peru and to study limiting factors in rice and corn production in the Selva. The latter will include an analysis of supply of inputs, cost of production, economic value of varieties and technologies in corn, location of mills, transport costs, use of by-products, and credit needs of farms and agro-industries.

The new Leader and Co-Leader have moved rapidly to structure a unit which will contain four components--research, extension, training, and statistics. Five people with masters degrees are being stationed at regional locations (Tarapoto, Chiclayo, Huancayo, Cuzco, and Ancash). There also are approximately 50 people with less training scattered throughout the seven CIPAs.

The Leader and Co-Leader of the Agroeconomics Program are very capable, as are the individuals selected to oversee the four major subunits. The Agroeconomics Program has been designated to provide leadership for GOP inter-agency committees for commodity development. The program will also play a key role in providing economic analyses to assist INIPA's management in research resource management and allocation. The Co-Leader--a Ph.D. Agricultural Economist--has been asked to be a member of the steering committee for creating an Agricultural Policy Analysis Unit in the MAF and will provide an important linkage with that group. In this regard AID's proposed APID project (which, as one of its five components, provides technical assistance and other inputs to help create and develop MAF's policy unit, support for a Division of Economic Studies in MEF, and support for monitoring and evaluation capability of the Agricultural Sector planning office) is highly complementary and supportive of INIPA's Agroeconomic Program and vice versa.

Five training courses will be held in 1984 emphasizing farm records and planning in INIPA's agroeconomic unit. An effort has been initiated to get the CIPA personnel together with the Agricultural Bank, ECASA, and ENCI personnel so that factors that affect the demand for technology are coordinated with factors affecting technology supply.

The agroeconomics unit is too young to assess its performance, but its plans are reasonable and its leadership highly capable. Its emphasis on microeconomic analysis is correct and its coordination with the proposed policy unit in the MAF very important. The Sierra and Selva programs described below will rely on the Agroeconomics Program for assistance in farming systems research.

2. Sierra Program

The concept of Sierra Program was developed in 1983 to bring a farming systems approach to REE efforts in Peru's Andean Region. It will be initiated in early 1984 and the process of identifying a Co-Leader is underway. The Base program document lists objectives of identifying and evaluating farming systems; identifying limiting factors to increasing agricultural production; identifying, adapting, evaluating, and transferring technologies appropriate for the social and cultural setting; generating basic biological and economic information to improve agriculture in the region; and training of professionals and farmers.⁸

The Sierra Program will focus part of its efforts on crops not included in the national production programs and on livestock, especially small ruminants. It will contain components for pasture and forage improvement and soil and water conservation. The base document suggests significant interactions with the Agroeconomics Unit.

The concept of a Sierra program is a good one and the research and extension objectives appear reasonable. The program is very ambitious and will necessitate a careful determination of priorities. The Small Ruminants CRSP is expected to provide major technical assistance to the Sierra program. Close cooperation with the socioeconomic unit at CIP also will be useful. One benefit of the program is that it provides an umbrella under which other donors interested in assisting the Andean Region can tie into the national REE system.

One can question the capability of INIPA to carry out such a complex program at this time, given the relatively limited human capital base. This is a concern at the Leader and Co-Leader level where these key people are probably spread too thin. However, technical assistance and support from the Small Ruminants CRSP should help address the problem of limited INIPA human capital.

3. Selva Program

The Selva Program, developed in 1983, and due to begin in early 1984, also will have a systems focus, although less so than the Sierra Program.⁹ It will be concerned with increasing food and forestry products and with rational land use and soil productivity in the Selva. It has an objective of improving transport, credit, and marketing systems. Much of the REE efforts on the Selva Program will deal with commodities outside the five national production programs. It is concerned with stimulating the use of dual-purpose cattle (milk and meat), and perennial crops. Major training and evaluation programs are envisioned in addition to research.

The concept of developing a Selva Program is a good one. The Selva is the largest and least developed region in the country, but one that will require a well-structured REE system to avoid degradation of the fragile ecosystem.

The difficulty of transporting products from the low population density Selva to final markets will require careful consideration in the development of new technologies under the program. The Selva, like the Sierra Program, will provide an umbrella for multiple donor support, and will require substantial support from and integration with the work of the agroeconomic unit.

The Selva program has one weakness which requires attention. The mechanism or administration structure for coordinating the support of various donors has not been clearly defined. This is probably the weakest part of the Selva program, but the part which will largely determine the success of the program.

END NOTES

- 1 Thus, World Bank funds are supporting the principal technical assistance at the five NPPs even though four of the NPP headquarters are principally AID funded.
- 2 As noted above, technical assistance is really an input which should have been distributed among major project elements. The financial reports repeat the flaw found in the PP (because they follow the PP logical framework).
- 3 These figures are based on an internal evaluation done by CIPA X staff for 1983.
- 4 Programa de Capacitacion, INIPA, November 1981.
- 5 The Management Support Component of AID's new APID project will provide 48 person months of long-term technical assistance to INIPA to help improve management and administration.
- 6 Eighteen CIPA Directors, Deputy Chief, two Executive Directors, Internal Controller, Administrator, Technical Communication Director, Director of Planning, and Chief of SENAMA.
- 7 INIPA, "Programa Nacional de Agroeconomia", Documento Base, Lima, Peru, October 1983.
- 8 INIPA, "Programa Nacional de Sistemas de Produccion Andina", Documento de Base, Lima, Peru, undated.
- 9 INIPA, "Programa Nacional de Selva," Documento Base, Lima, Peru, 1983.

IV. CONCLUSIONS AND RECOMMENDATIONS

This Chapter contains the evaluation team's conclusions about accomplishments of the project and problems constraining it, and the recommendations which we believe will result in greater and more rapid progress toward achievement of the project purpose, i.e. a highly productive, self-sustaining REE system in Peru. The presentation follows the outline in the scope of work (see Appendix A). The format is to present for each major element in the scope of work our principal conclusions which are broken into two sets: (1) accomplishments; and (2) problems. Our recommendations then follow for each conclusion or associated set of conclusions for the major element in the scope of work. Recommendations are directed toward the amelioration of problems we have identified and also are founded upon the accomplishments of the project, i.e., the accomplishments provide a basis for expecting recommendations to be effective in addressing remaining problems. In Section A below we make two major recommendations: (1) extend the first phase of the REE project by two years; and (2) begin preliminary planning for a second phase. The format for recommendations in subsequent sections is to divide them into two groups: (1) those to be implemented during the recommended two-year extension of the project; and (2) those to be implemented during the proposed second phase. For each recommendation we indicate the agency(ies) responsible for planning and implementing the recommendation and the time frame for such actions. Those recommendations which we believe require immediate attention are indicated as "highest" priority, although we believe all our recommendations are important, substantive, and if implemented, will result in improvements in the project.

A. Project Viability and Appropriateness

1. Accomplishments

a. The USAID Research, Education and Extension Project (No. 527-0192) is making good progress toward the achievement of the project purpose and end-of-project status.

b. One output not anticipated in the PP is the integration of the AID project, and BID and World Bank projects into INIPA's Integral REE Program of \$121.0 million--far beyond the \$15.0 million AID project. The team considers this to be a major achievement of INIPA, AID and NCSU, and well worth the initial delay in implementing the elements of the AID project.

c. A unique collaborative working relationship has been developed between the World Bank, BID, AID, and other minor donors as co-financiers of the Integral REE Program, and between these donors and the IARCs (especially CIP) and the CRSPs. This integral approach has resulted in a more efficient use of development resources for Peru's REE, and a better

division of labor among donors. The team considers this to be an important basis for more effective support in the future.

d. Substantial progress is being realized toward the achievement of project purpose, with principal project outputs coming on stream after only about one year of implementation and significant momentum toward end-of-project status, especially in the NPPs, the RSLs and to a lesser extent in the education program.

e. The mix of commodity programs proposed in the AID project--corn, rice, potatoes, small grains, and edible legumes--is appropriate given the large imports of the items, the large trade deficit, the importance of these crops to poor and middle-income consumers, and the substantial capacity to produce these crops domestically. Moreover, these commodities have been given the same priority in the Integral REE Program with concurrence by BID and World Bank advisors. Consequently, the five NPPs which were proposed for focused regional support in the PP now are nationwide with a much higher level of funding support than was possible in the AID project. The three new systems-focused NPs will broaden the single crop focus of the initial five NPPs and accommodate the reality of the more complex farm-enterprise systems, and socio-economic environment under which small farmers operate, assuming INIPA can marshal the requisite human capital and financial resources to fully implement these NPs.

f. Three components of USAID's recently approved APID project directly complement AID's REE project and INIPA's Integral REE Program in that: (a) APID's Agricultural Policy Analysis Component (through support for MAF's Agricultural Policy Analysis unit, MEF's Economics Studies Unit, and of MAF's Agriculture Sector Planning Office) is highly complementary to and integrated with INIPA's Agro-economic Program; (b) APID's Human Resources Development Component, (especially support for UNA) is congruent with the Education program of AID's REE project, with our judgement that the Education program needs more emphasis (see below), and with the proposed World Bank loan to UNA; and (c) APID's Management Support Component, especially provision of technical assistance to INIPA to strengthen management and administration is consistent with our judgement that inadequate management and administration are among the principal constraints to greater progress in developing a viable REE system (see below). The Information and Private Sector Components of APID are also complementary to AID's REE project.

2. Problems

a. The need for technical assistance in research, extension, and education is more critical than ever. Peruvian agricultural scientists have been spread thinly across 18 CIPAs rather than concentrated at the five sites originally proposed in the AID project paper. In addition, fifty-two people are now involved in long-term training.

b. The implementation of the AID project, per se, is behind schedule by about two years due both to problems in AID and the GOP which delayed selection of a contractor by 15 months until January 1982; and because of the approximately 12 months required for conceptualizing, reprogramming and coordinating of BID, USAID, and World Bank funds; yet the project is slated to terminate in early 1985 as scheduled in the implementation plan. The AID project expenditures from AID funds were at about 75 percent and long-term technical assistance was 54 percent of the programmed levels through December 31, 1983. Expenditures of GOP funds were at 147 percent of the programmed level for the same period.

c. There have been a number of substantial material changes from the original AID project which are inherent in the Integral REE Program. However, basic project documentation (PP, PROAG, NCSU's Contract) remains essentially the same as it was in 1980 when the USAID project was approved. While several modest changes have been documented such as extension of the project to permit long-term training, several major deviations from the PP, PROAG, and NCSU's contract have not been documented or formally approved. There currently are no plans to implement the National Research Support Unit (although the concept is under discussion in INIPA and AID) or the National Management Unit. Support for the Education Program has been reduced substantially, and the NPPs and Regional Research Centers have been developed as an integral part of CIPAs. The Regional Service Laboratories have been extended in number and organized as an NP, and three other NPs with a more system-wide focus--the Selva Program, the Sierra Program, and the Agricultural Economics Program--have been developed. These substantial changes require formal acknowledgement and documentation.

d. The institutional capacity of the REE system in Peru is still relatively fragile and tenuous (despite the significant progress under the AID project, and INIPA's Integral REE Program) and, as envisioned in the baseline study and PP, will require long-term, sustained donor support for a decade or more.

e. Peru's agricultural research, education and extension expenditures are quite low relative to other countries when measured as a percentage of agriculture GDP.

3. Recommendations

On the basis of these interrelated conclusions about accomplishments and problems we proffer the following recommendations:

a. Extend First Phase of Project (AID, INIPA, NCSU: Highest Priority; by September 1984). Extend the first phase of the project by two years through January 1987 and provide additional grant funds for the USAID technical assistance that was used to conceptualize, coordinate and reprogram the AID, World Bank and BID project funds.

b. Review and Amend Project Documentation (AID, INIPA, NCSU; Highest Priority; by August 1984). Review the project design and logical framework of the PP in light of changes and alterations inherent in the integral REE project and amend the PP, loan agreement, and NCSU contract to reflect material changes in conditions, to provide a revised implementation schedule, and to extend the first phase of the project per recommendation a, above.

c. Begin Preliminary Planning for Second Phase of Project (AID, INIPA, NCSU, other Donors; Start CY 84, continue through 1985 and 1986 as needed). AID should take the lead in meeting with BID, World Bank, CIP, CIMMYT, CIAT, other donors and the Tropical Soils and Small Ruminants CRSPs to propose a task force for preliminary planning for a second phase of INIPA's Integral Program, on the basis of expectations of a successful first phase AID project, and Integral REE Program and as called for in the Baseline Study and PP. We suggest that an inter-agency planning task force be appointed and that the following general approach be considered:

1. A single project be developed to which all donors would contribute;
2. That donors develop a mechanism for jointly funding and managing the project (so that INIPA and other host country agencies would be able to account to one fund rather than three or more different donors with different audit and accounting rules; and so that donor management could be more efficient and simplified);
3. That AID, BID, and World Bank seek to obtain through the use of conditions precedent:
 - a. more reliable, sustained GOP funding support;
 - b. improved salaries for Peruvian agricultural scientists;
 - c. an INIPA more insulated from political influence, with a more stable professional orientation;
 - d. an improved policy climate (e.g. with more appropriate price, and credit policy); and
4. That the second phase be planned for a minimum of five years; and
5. That consideration for second-phase emphasis be given to: genetic research and breeding in areas complementary to the efforts of the IARCs, especially in the unconventional crops where IARC support is limited or non-existent; supporting research such as soil fertility, plant nutrition, entomology, plant pathology, water management and weeds; increased research and extension work in small ruminants and rangelands/pastures in the highlands, and large ruminants and improved pastures in the Selva; research on seed technology, post harvest storage and processing, and strengthening the higher educational system (see recommendations in Sections B., C., and D. below).

d. Identify Alternatives for Long-term Funding of INIPA's Operations (AID, INIPA, Other Donors; Highest priority; Planning CY 84, Implementation during Phase I Extension and in Phase II). Identify alternative mechanisms for supporting INIPA's operations costs in both the immediate future and in the longer term, recognizing the nearly intractable fiscal crisis of the GOP in the short term and the very difficult problem in the longer term. We recommend a special study be commissioned to identify independent sources of funding which could be earmarked for INIPA. We also recommend AID consider the use of PL 480 proceeds as a source of counterpart funding for both AID, BID, and World Bank projects supporting INIPA's Integral REE Program for the recommended extension of Phase I and for the recommended Phase II of AID's project. We also recommend AID carefully consider programming development assistance funds for operations budget support for the proposed extension and for Phase II per policy guidance in AID/W's Policy Paper for Food and Agriculture.¹

B. Research

1. Accomplishments

a. The five RRCs programmed in AID's project have been developed as an integral part of the five NPPs, and are coordinating a national network of researchers focused on the crops of the five NPPs.

b. The IARCs are an integral part of the NPPs and are currently backstopping much of the research at RRCs that is supporting the initial progress noted in the NPPs (the Canadian project in Puno also is providing substantial backstopping in wheat research). Domestic research, per se, currently comprises a small proportion of the research activities of any of the NPPs/RRCs, but it is increasing and as current research plans are implemented there will be more balance (the NPP in potatoes now has relatively more domestic research than the other NPPs). The RRCs are wise not to try and duplicate the work of the IARCs and Canada in supporting the NPPs, and fortunate that so many viable crop lines are available for testing.

c. One important result of the AID REE project is the incorporation of AID/W's Small Ruminants and Tropical Soils CRSPs as key components of INIPAs Integral REE program and their enhanced complementarity to the REE project. These two CRSPs also have the potential to provide backstopping for research in the new Sierra and Selva NPs, respectively, in the same way the IARCs have backstopped the five NPPs.

d. There is some division of labor in research within the NPPs. For example, in the NPP for Selva rice, the Alto Mayo Experiment Station is selecting for disease resistance, Yurimaguas for tolerance to acid soils, and Tarapoto for labor-saving cultural practices, with selected lines being tested at each of the three sites in order to isolate varieties that are widely adapted to the region.

e. There is considerable research being done at experiment stations that lie outside of the NPP thrust. Other Integral REE Program resources are going into these other programs such as CRSPs, special projects, etc. Examples of such research include large and small animals, tropical fruits, tropical soils, forages and pastures, grapes, cotton, quinoa, tarwi, etc. With the exception of cotton, grapes, and coastal forages, these crops and livestock are now being integrated into the Sierra and Selva programs which will be implemented in 1984.

f. The International Potato Center (CIP) has played a major facilitating role in providing a mechanism for accessing the resources (human and otherwise) of the other international centers and other international resources in support of the Integral REE Program, in addition to the excellent work they are doing in the NPP for potatoes. This has been an important factor in the degree of success achieved in these programs but to date has had to be carried out on an informal, ad hoc basis.

g. The new NPs (Agroeconomics, Sierra, and Selva programs) are a positive development and are likely to play an important integrating role in the research program.

2. Problems

a. The principal research focus of the RRCs in corn, rice, small grains, and edible legumes is on variety selection for yield, disease and insect resistance, with only limited supporting research being done on associated problems such as soil fertility, water management, weeds, and other factors. These variety selections are focused on the production problems that are currently the most limiting constraints. The potato RRC has a broader research program.

b. The level of human capital in the RRCs and INIPA's Research Division is extremely small. Most of the progress in the RRCs is due to the well qualified and highly motivated Leaders and Co-leaders (in all the NPPs) and their linkages to and the support they receive from the IARCs and CRSPs. Unfortunately the next level of human capital is quite limited, although this will be eased somewhat as the fifty-two people in long-term training return to INIPA. However, the level will still be below the level of the pre-military government, and a loss of any one of the Leaders or Co-leaders could severely constrain the progress in the NPPs.

c. The research role of UNA in the NPPs and the RRCs needs to be better defined and reinforced. The research professors represent a considerable resource in addition to their role as advisors to graduate students but education and UNA specifically have not been as fully integrated into Peru's REE system as envisioned in the PP.

d. Research interfaces with extension through off-station field trials and demonstration as part of the NPPs. Both researchers and extensionists should be involved with the field work and the major leadership and management role should be determined by the relative emphasis on research (information development) versus extension (information transfer). Most NPP activity is extension related some of which is being carried out by research workers. This leads to confusion among extension (and research) workers as to their explicit function.

e. The National Research Support Unit has not been developed and there currently are no concrete plans or consensus on its role or what this unit should comprise. We believe the concept is still viable and requires more focused attention.

f. The capacity for experimental design, and for analysis of research data are inadequate. Critical peer review of experimental design and analysis of data needs to be improved, as does computational capacity.

3. Recommendations for Proposed Project Extension

a. Continue to Rely on IARCs for Genetics Material (INIPA; 1984-86). In the short term (during proposed extension) continue to rely heavily on the IARCs, the CRSPs and Canada's Puno project as sources of genetic materials together with technical assistance for selecting breeding lines.

b. Provide for Greater Involvement of UNA in Research in the REE System (AID, INIPA; Highest Priority; by September 1984). It is recommended that the UNA be moved from a tangential position to a more participatory position in research in the Integral REE Program during the proposed extension of the project. The output would be an increased amount of INIPA and university research and an increased number and better quality of graduate students (see Recommendation D.3.b. below).

c. Fortify Small Grains Research (INIPA, AID; during next two years). INIPA should fortify the small grains research program. This would include added resources for barley and oats because of their economic significance to small farmers. The study being carried out by the Agroecconomics unit to determine whether wheat can be produced economically in Peru is important in this regard.

d. Develop National Research Support Unit (INIPA, Planning 1984; Implementation 1985). A National Research Support Unit should be developed which would:

1. Establish and implement a pre-publication review system and national and international peer review of in-country technical reports.

2. Develop a centralized research facility or pool for purchase, construction and maintenance of costly and highly specialized research equipment.
 3. Organize and expedite national technical reporting conferences.
 4. Instigate and coordinate research with other public and private research centers such as UNA, regional universities, and private or cooperative research groups such as cotton, grape, sugarcane.
 5. Organize a national research council. The national research director could serve as executive secretary to this council. This council would evaluate the need for and allocate funding to cover research needs not presently addressed in the NPPs. Particular attention should be given to animals and animal products which currently represent a major source of cash income to small farmers.
 6. Develop a germplasm bank for those crops and areas which are complementary to the banks of the IARCs. Special attention should be given to basic food crops and non-conventional indigenous crops not adequately covered by the IARCs or other international banks.
- e. Develop an Agricultural Library (UNA, INIPA, AID; Planning 1984, Implementation 1985). Develop a national agricultural technical library at UNA and make these resources available to all research and extension people.
- f. Develop Computer/Applied Statistics Center (INIPA, AID, NCSU; Planning, 1984; Implementation, 1985). Develop and maintain a computer facility including both hardware and software for reduction and analysis of data. This facility would include a staff trained in applied statistics (experimental design and analysis of research data) and computer programming. The staff would be mobilized and available on call to research scientists (The same computer center could support the accounting, budgeting and other administrative functions of INIPA (see Recommendation E.3.d. below)).
- g. Form Strong Linkages with AID's APID Project through INIPA's Agroecconomics Unit (INIPA, AID, NCSU; 1984). Use the Agroecconomic Program to assist the leadership of INIPA with REE resource allocation issues, and to provide a strong linkage between AID's REE project and the several components of AID's new APID project in MAF, MEF, UNA, University of the Pacific (UOP) and within INIPA.

4. Recommendations for Proposed Second Phase

- a. Broaden INIPA's Research Program (INIPA, AID, other Donors; Planning in 1985; Implementation Post 1986). INIPA's research program should be broadened to include development of research capabilities other

than crop varietal selection and breeding, such as soil fertility and plant nutrition, entomology, plant pathology, plant physiology, and irrigation as related to on-farm water management. Also soil and water conservation, seed technology, and post-harvest storage, processing, crop and food preservation should be addressed. Additional resources should be allocated to livestock research--small ruminants in the Sierra, large ruminants in the Selva, and barnyard animals and fowl in both regions. In addition, marketing and market forecasting may be developed by INIPA as a service to producers in order to facilitate orderly production levels that avoid cyclic imbalances of supply/demand.

b. Develop Breeding Expertise and Germplasm Banks Complementary to IARCS (INIPA, AID, other Donors; Post 1986). For the long term (during proposed second phase), develop plant breeding expertise that will complement the IARCs, and a germ plasm bank for the crops not currently being backstopped by the IARCs. Since the IARCs' and CRSPs' products are readily available, local plant breeding capabilities should not substitute in total for the services of the IARCs.

c. Integrate Agencies Involved in Water/Irrigation Research into Peru's REE System (INIPA, MAF, AID, DGASI, INAF, ONERN; Planning in 1985-86, Implementation in Post 1986). It is recommended that agencies involved in water resource research and on-farm water management research be included as an integral part of Peru's REE system. INIPA should take responsibility for initiating dialogue on coordination of currently diverse efforts. There should be three facets to water research as part of Peru's Integral REE program:

1. On-farm water management: Information is needed on efficient distribution of irrigation water and soil moisture re-charge. This includes on-farm water control structures, irrigation scheduling, irrigation methods, and an evaluation of irrigation soil moisture interaction with soil fertility, crop type and variety, and pest management as these relate to irrigated crop production costs and returns.
2. Sierra and arid zones: study watershed management and other factors as related to water yield and sediment load; how to reduce sediment load as a major management cost in coastal irrigation districts. This applies to both canal system maintenance and on-farm sedimentation as it affects soil chemical and physical properties.
3. Selva: study water resources in terms of rivers and ground water potential and the relative merits of pumping ground water vs. river diversion and canal construction. Include sediment burden of river waters as a management issue. Also include seasonal fluctuation of river and ground waters vs. year-round supplemental irrigation for paddy rice and upland crops.

C. Extension

1. Accomplishments

a. The national production programs (NPPs) are beginning to function, with remarkable progress considering the short time they have been under implementation. Especially strong results are apparent in potatoes, rice, and corn; and acceptable results in small grains and edible legumes.

b. There is clear evidence that some farmers are beginning to adopt improved technologies as a direct result of the NPPs, and that researchers are beginning to work on constraints identified through the NPPs with the greatest research progress in potatoes and rice, and greatest farmer adaptation of improved technologies in rice.

c. The collaboration and division of labor between the NPPs and the IARCs is excellent with a major extension thrust being carried out by the NPPs with supporting research by the IARCs. The Co-leader of each program works under auspices of the involved IARC and provides a direct link to the international center.

d. The rapid progress in the NPPs for potatoes, corn, and rice is largely due to the involvement of the IARCs and their stock of available technologies (mainly in the form of improved lines and varieties). The lack of success in the edible legumes reflects the limited stock of technologies at CIAT (or elsewhere) for addressing the principal problem (root rot), and cultural preferences for beans for which there are no improved varieties.

e. Seed multiplication is beginning to occur in potatoes, rice, beans and corn with cooperating farmers now growing improved varieties as foundation seed.

f. There is a significant amount of extension work on non-NPP crops and livestock; e.g. dairy cattle, pastures and forages, guinea pigs, rabbits, sheep, quinoa, tarwi, grapes and cotton, which will be integrated in the NPs for the Sierra and Selva when they are implemented in 1984 (except grapes and cotton).

g. The Regional Service Laboratories have been planned and organized as an NP with three Central Service Laboratories, eight Regional Service Laboratories, and one Training Laboratory. The new equipment for these laboratories is all ordered and most has been delivered to Lima. The training laboratory is functioning with 34 INIPA personnel trained during January 1984 and the 11 service laboratories expected to be installed and functioning within six months.

2. Problems

a. The extension of research results in some NPPs is being carried out by researchers with only limited integration of and support from CIPA extensionists. In other areas extension is fully integrated and involved. For example the NPP for rice in the Selva has good integration and support from extension in the Rioja Zone, but much less support in the Tarapoto Zone. Extension and research are well integrated in the NPP in potatoes at Huancayo. An integrated research-extension effort in small cereals has just started in the Cuzco area. There is confusion and uncertainty over lines of authority and responsibility in the extension program.

b. A principal constraint to more effective extension work is the lack of well-trained extension specialists who bridge the gap between researchers and extension agents, and ultimately, farmers. The lack of specialists is at least partly due to lower salaries (by law) for Ingenieros Agronomos employed as extension specialists than for other alternative employment in INIPA.

c. Extension workers still are severely constrained by lack of operations funds, vehicles, etc., although those working within the NPPs are being supported by AID, World Bank and BID funds. All of these support items have been ordered but are not in place at this time with reports of slow provision of inputs (especially vehicles) from all donors including AID.

d. The NPPs may be having a negative impact on the morale of extension (and research and education) workers who are not a part of the NPPs and who, therefore, do not qualify for salary supplements, long-term training, or special operations budget support, and who do not share in the feelings of accomplishment that are evident among those within the NPPs. Extension specialists are also under constraints relative to research workers due to the base salary for this category of professionals within the Peruvian law on salaries (see C.2.b. above).

e. The T & V extension model has limited application to the conditions of Peru. It is not being widely accepted and utilized principally because of its almost exclusive concern on extension methodology with limited attention to the development and selection of important technologies to be transferred. It is also not being widely utilized because of the lack of requisite infrastructure and associated budget support. Most CIPAs have responded pragmatically to the rigidities of the present system and have modified it to fit local conditions.

f. There are only modest efforts to interact with the private sector to assist with extension service functions in the five NPPs. These efforts need to be increased.

g. There is currently very little agricultural economics input in the extension program.

3. Recommendations for Proposed Project Extension

a. Define Roles of Research and Extension Specialists (INIPA, NCSU; Highest Priority; July 1984). The integrative relationship of research and extension specialists at the CIPA level should be better defined. The base document for the NPP in rice currently states the concept as follows:

Integration of research and extension within the proper roles of each is of the utmost importance. To a large extent this should be achieved through increased reliance upon specialists of commodity and selected supporting subject matter areas at the zone or CIPA levels. The qualifications for this position should be clarified and should emphasize the experience, interest and subject matter training of the individuals in the positions. Responsibilities of the position should emphasize working effectively with agents and researchers to achieve technology adoption and progress by farmers. Agent and sectorista training is of key importance.

b. Clarify Lines of Extension Supervision (INIPA, NCSU; Highest Priority; October 1984). The lines of extension supervision from national executive directors through the CIPAs to the zone offices should be clarified. The responsibilities of extension supervisors should be clarified and strengthened to emphasize collaboration in program planning as well as supervision and evaluation.

c. Continue to Adopt and Modify the T & V Extension System to the Realities of Peruvian Agriculture (INIPA, World Bank, AID, NCSU; Highest Priority; July 1984). Consideration should be given to alterations in T & V, and alternatives to it for extension supervision of priority locations for agents and sectoristas, possibilities for reducing or relocating agents, and sectoristas, combining zones, etc. The T & V system, per se, should be continued only where local infrastructures, equipment, budget support, and geography are adequate to permit the system to function effectively. The remaining areas of the country should be instructed to utilize more pragmatic extension methods that fit the local resource constraints and conditions with a broader focus on technology development and selection of new technologies, as well as method of transfer.

d. Fill Vacant Positions and Provide Requisite Salary Supplements (INIPA, AID; Highest Priority; September 1984). Vacant positions that are critical to carry out the objectives of the NPPs (especially Extension Specialists) should be filled. Steps should be taken immediately to achieve salary recognition for technical competence, experience, and performance in all professional positions of INIPA. In the long run, this would probably require changes in the salary law regarding public employees, which will be very difficult and slow to achieve. To achieve the impact urgently needed from certain INIPA positions, temporary supplements to the base salary based upon the above justifications should be considered.

e. Upgrade Existing Technological Packages for Commodities Outside the NPPs (INIPA, NCSU; 1984-1985). Existing technological packages for commodities outside the NPPs should be reviewed, strengthened with existing new research information to meet the needs of farmers, and disseminated. Associated intensive short-term training programs for specialists and agents should be mounted on a high priority basis.

f. Contract with CESPAC for Specific Training of Extension Workers, and for Audio-Visual Extension Aids (INIPA, ESPAC; as requisite). CESPAC has the capacity to assist INIPA with training of extension professionals and para-professionals. It also has the capacity to produce, in collaboration with INIPA's researchers and extension workers, audio visual training aids--especially video tape cassettes--to illustrate technological packages, and cultural practices. These aids could then be used by extension workers to train farmers. We recommend INIPA contract with CESPAC for these services.

g. Evaluate the Cost Effectiveness of the Extension Teleconference System of ENTEL in Tarapoto (INIPA, ENTEL; 1984). The extension teleconference project of ENTEL (developed under AID support) can be used as a training aid by extension personnel. It may also be used as a means of rapid communications by INIPA headquarters personnel and field offices. The overall utility and cost effectiveness of this system should be carefully studied by the Agroecconomics Unit of INIPA and considered for possible replication.

4. Recommendations for the Proposed Second Phase

a. Develop New Technological Packages for Crops and Livestock Outside the NPP (INIPA, Post-1986). New technological packages in crops and livestock outside of the five NPPs should be developed, especially small ruminants and forages in the Sierra, and large ruminants and pastures in the Selva. The ongoing training program for extension workers should be strengthened and expanded to include these new areas.

b. Involve Private Sector in Extension (INIPA, AID, other Donors; Planning 1984-85, Implementation Post-1986). Efforts should be made to facilitate collaboration of extension with agroindustries as they may fulfill a significant extension function. Also, INIPA should increase its efforts to work with the private sector (producer groups, supply industries, and processing-marketing firms) and other public agencies (such as ECASA and the Agricultural Bank) involved in providing inputs to agriculture or in marketing.

D. Education, Training and Human Capital

1. Accomplishments

a. The UNA has become more involved in the Integral REE Program during the last year. Faculty are involved as advisors to graduate students carrying out research as part of the NPPs, and in providing

short and long-term training to INIPA personnel to strengthen the research and extension elements of the project despite a lack of funds for the Education Program, per se.

b. A relatively large number of people have been placed in long-term training (40 at UNA for M.S. degrees, 6 Ph.D.s abroad with 4 more to go, and six in training programs at international centers). This was done quite early in the project which has left a dearth of people to implement the ambitious Integral REE Program. In addition, a number of short courses have been held or are programmed to begin shortly.

2. Problems

a. Human capital, especially scientists at the Ph.D. and M.S. level is, and is likely to remain, the most limiting factor to a highly productive REE system. The Education Program, and training inputs in the Research, Education and Extension components of the project are extremely important to the development of a viable REE system. A change in salary policy, to pay salaries to professionals at a level that is competitive with alternative opportunities would likely result in a substantial infusion of human capital and in a relatively short time frame. Concomitantly, greater emphasis should be given to increasing the proportion of Ph.D.s in the REE system if Peru is to develop a science-based agriculture.

b. AID resources programmed for strengthening the Education Program have been reduced substantially with the understanding that a World Bank loan (separate from the Integral REE Program) would be used to provide for library acquisitions, equipment, vehicles, etc. AID project funds for the Education Program have been provided only for training, and for salary supplements (which are only beginning to flow). AID's proposed new APID project will provide some additional support for UNA mainly in the form of technical assistance.

c. The Education Program is not as well developed nor has it become as well integrated into the overall REE system as proposed in the AID project. Both UNA and INIPA somewhat resisted working more closely together early in the REE project. AID's APID project will not necessarily result in UNA being more integrated into Peru's REE system unless some mechanism is developed to tie UNA/APID with INIPA/REE.

d. The position of education advisor in the NCSU technical assistance team was never filled although described in the contract as a "key position", and was recently changed to part-time support of six to seven months per year focused on training inputs to research and extension elements of the project. We believe failure to provide this long-term advisor has been one factor in constraining the integration of education into the REE system, and to greater progress in the Education Program of the project.

e. INIPA, as most research institutions, is managed by scientists and agricultural professionals. Few of these staff have had the opportunity of being exposed to modern management training.

3. Recommendations for Proposed Project Extension

a. Complete Manpower Needs Assessment (INIPA, AID, BID, World Bank; Highest Priority; through 1984 and 1985 as requisite). INIPA, with AID, BID, and World Bank support should form a joint task force, develop a rationale and strategies for a manpower needs assessment for agriculture, and complete such a study. Careful attention should be given to salaries for agricultural professionals working in the REE system in Peru. (Much higher salaries are necessary if any of the gains made to date in the integral project are to endure (see also Recommendation A.3.c)). This task force should be led by INIPA's proposed Human Resources Management and Development Unit with appropriate operational and technical assistance support from AID, BID and World Bank. The Agroecomics Program should also be involved in this effort as should the proposed Policy Analysis Unit of MAF.

b. Provide Long-term Education Advisor to INIPA (AID, INIPA; Highest Priority; by October 1, 1984). A long-term education advisor should be provided to INIPA through the NCSU contract team. His principal assignment should be to strengthen and support the Education Program of the AID project, as well as help coordinate the training inputs of all the elements of the project (we believe AID, NCSU, and INIPA have confounded the Education Program (an output of the project) with training (an input in all the elements of the project)). He would also collaborate with UNA and APID advisors to improve UNA's graduate curriculum. He should be trained in an agricultural science and have a strong research and teaching background. He would be assigned to INIPA and advise and assist the Institute on the programs proposed in Recommendations D.3.c., D.3.d., D.3.e., and D.3.f. below. AID should also seriously consider amending the REE project and NCSU's contract to have NCSU provide the technical assistance to UNA proposed in the APID. This would provide a mechanism for integrating higher education more completely into Peru's REE system, provide for coordination and integration of effort between AID's APID and REE projects, and reduce the number of foreign entities involved in providing technical assistance to UNA and indirectly to INIPA.

c. Establish an INIPA Research Grants Program at UNA (INIPA, AID; Highest Priority; by January, 1985). A modest research grants program fitting national program priorities should be established by INIPA (with AID, BID or World Bank funding) for university faculty. Several small grants would be provided to university faculty on a competitive basis for research in areas of interest to INIPA. Grants would include stipends for students, research support costs, travel for major professor and student, supplies, and perhaps salary supplements and modest equipment needs.

d. Establish a Domestic Thesis Research Program for Participant Trainees (INIPA, AID; Highest Priority; by January 1985). A domestic thesis research program should be provided for all AID participants studying abroad. Funds should be provided for travel of the student and his major professor to Peru and return to design the research program (in addition to regular AID participant training support), and for the time of the major professor (up to one month) who would collaborate with university, INIPA, and NCSU colleagues in designing the research. Funds should also be provided for domestic travel and supplies.

e. Program Additional Funds for Long-term Participants (INIPA, AID; Highest Priority; Project Extension, Second Phase).

AID should program funds for additional long-term participant trainees. As a current participant completes his training and returns to INIPA or UNA, another should be sent for training (so as to not further decrease the number of trained people in the REE system). Emphasis should be on Ph.D. level training to move more quickly to a stronger science base.

f. Carry out Formal Evaluation of Short-term Training (INIPA, NCSU, October 1984). Formal evaluations should be built into all short-term training courses.

g. Provide Management Training to INIPA Staff (INIPA, AID; Planning, 1984; Implementation, 1985). INIPA should initiate a routine program to provide opportunities for Director-level staff to attend high-level short courses in management (such as the one offered by Cornell University). This should maximize the effectiveness and efficiency of the INIPA's integral management process. Second-level management training should be provided for four to six INIPA employees per year with a special program to be developed by ESAN (such training may be provided under AID's APID project).

4. Recommendations for Proposed Second Phase

a. Strengthen Several Regional Universities (AID, World Bank, BID, UNA, INIPA, Planning 1984-85; Implementation Post 1986). AID, World Bank, and BID should move to strengthen the faculty and undergraduate program at a selected number of regional universities. INIPA's long-term education advisor should assist in coordinating the research in the NPPs and NPs with undergraduate theses of students at regional universities with the NPPs.

E. Administration and Management of the REE

1. Accomplishments

a. AID, through its contractor NCSU has played a major role in helping INIPA to: (a) conceptualize and coordinate the integration of major AID, BID, and World Bank projects, and several smaller bilateral, and multilateral projects into the Integral REE Program; and (b) manage and administer the implementation of this large (\$121.0 million) and complex undertaking. INIPA's decision to integrate NCSU's team members into INIPA's administrative management structure and give them quasi-executive roles has undoubtedly enhanced the productivity of NCSU's technical assistance team.

b. The International Agricultural Research Centers have played an important role in the management of the REE system by participating in the planning of the NPPs, and by providing the Co-Leaders who are jointly responsible for the management and direction of the NPPs. (These Co-Leaders have been extremely effective, are highly respected by their Peruvian colleagues, and are working at a National level (although they are financed by the World Bank which is principally focused on the North Coast CIPAs). In addition, CIP has played a key supporting role by providing the employment status in Peru for the Co-Leaders from sister IARCs and for other international scientists working in the REE system, including the CRSPs and NCSU's Chief of Party.

c. The support services provided by NCSU and AID in providing inputs for the REE project seem to be functioning reasonably well. There is close coordination between AID and NCSU. The budgeting process appears to be adequate and procurement is reasonably efficient, although some inputs (notably vehicles) are behind scheduled delivery dates which is constraining progress in NPPs.

2. Problems

a. Financial, administrative and management factors, rather than technical factors, are the principal constraints to a more viable and effective REE system, subsequent adoption and utilization of improved technologies, and a more modern, science-based agriculture.

b. A National Management Unit has not been implemented and little priority is given to so doing. A coordinating committee comprised of UNA and INIPA representatives was organized but has not met for over 18 months. Research and extension are coordinated and managed within INIPA, but there is little coordination or management of education as an integral element of the REE system.

c. The reporting process is subject to question, with NCSU's reports not being adequate during the period April 1982 - December 1982. It appears that there is some confusion and uncertainty over the purpose

of reports with written identification of problems for improved management being confounded with report of accomplishments. Quarterly progress reports may be too often, while reports identifying problems for management consideration and solution may need to be made more often than quarterly.

d. Monitoring and management of the REE project at the CIPA and "Zonas de Promocion" level is inadequate because of communications constraints as well as for the interrupted lines of authority of the Executive Directors and the excessively wide span of command of the Chief of INIPA, his Deputy, and the Directors of Research and Extension.

e. INIPA's infrastructure for financial management, especially computational facilities and equipment is inadequate, especially at the CIPA level. Equipment, (currently adding machines) available per accountant is insufficient and personnel assigned to accounting, budgeting, purchasing, and inventory control have not always received pertinent training. Current plans to utilize computers for these management functions should be given highest priority.

3. Recommendations for Proposed Project Extension

a. Form National Steering Committees for REE System (INIPA, UNA, AID; Highest priority; October 1984). A National Steering Committee should be formed in order to integrate efforts between the Research/Extension and Education Sectors. This committee should not be an executive body, but should provide philosophy, policy, and feedback to both sectors; it should also integrate their efforts in order to find complementarity and avoid duplication. Initial efforts might focus on alternatives for integrating UNA's corn, wheat, and barley programs into INIPA's NPPs.

b. Review and Improve Organization and Management of Research and Extension (INIPA, AID; Highest Priority; October 1984). INIPA should review its organizational structure in order to find ways to provide direct lines of authority for setting and implementing policy from the Executive Directors of Research and Extension to the research and extension activities at the CIPAs, and to reduce the span of command of the Chief and Deputy Chief of the Institute. This should be done in a diagnostic study of organization and management and appears to be fully consistent with the mandate of the technical assistance to be provided INIPA in AID's new APID project in collaboration with NCSU advisors. The lines of authority from the Jefatura to the sectorista should more clearly specify the role of the Leader and Co-Leader of the NPPs, and the role and relationships of researchers and extension specialists.

c. Formalize CIP Support (INIPA, MAF, Ministry of Finance, CIP; Highest Priority; July 1984). The administrative support provided by CIP to scientists from sister centers and NCSU should be made official in order to guarantee continuity of the important role played by these scientists, and permit CIP to continue this important function.

d. Provide Additional Support to INIPA's Financial Management (AID, INIPA, other donors; Highest priority; October 1984). Additional financial support and technical assistance should be provided to INIPA's financial management units in order to guarantee adequate monitoring, comptrolling, accounting and oportune rendering of financial statements. (The REE project has provided some support in the form of technical assistance and computers. Much of the additional support likely will be provided under AID's proposed APID project in the Management Component). The quantity and quality of computers and other equipment should be urgently increased and upgraded. Some REE or APID resources may need to be reprogrammed to upgrade financial management capacities at the CIPAs. A single Computer/Applied Statistics Center should be developed to serve both the needs of researchers, and administration/management (see Recommendation B.3.f above).

e. Modify Reporting (AID, NCSU, INIPA; October 1984). AID, NCSU, and INIPA should meet and clarify the purpose of reports from NCSU and their frequency. We suggest consideration of (1) an annual work plan; (2) a comprehensive annual report of accomplishments against work plan; and (3) management reports on problems and successes (succinct and frequent--perhaps monthly).

F. Institutional Performance

1. Accomplishments

a. NCSU has done an effective job in carrying out its contractual obligations to AID (despite the staffing problem noted below). NCSU has been effective in its working relationships and is highly regarded by the professionals and administrators of all the organizations with whom we met (INIPA, BID, World Bank, MAF, CIP, CIMMYT, CIAT and UNA). In fact, no member of this team has heard anything but praise for the NCSU team, with no criticism, direct or implied, of any of NCSU's staff. NCSU has played a major role in the substantial progress realized to date toward achievement of project purpose.

b. AID has played a catalytic, productive role in developing and implementing the integral REE project. It sponsored the Baseline Study, proposed the initial AID project and contracted NCSU to provide technical assistance to INIPA. AID has endorsed and supported the development of the Integral REE Program, and the key role played by NCSU in helping INIPA to conceptualize, reprogram, and coordinate the additional BID and World Bank loans. As a result, the conceptual model and elements of AID's original project are the basis of the Integral REE Program and AID has a closer working relationship with BID and the World Bank.

2. Problems

a. The principal institutions participating in this project--INIPA, AID, and NCSU--have all experienced significant levels of turnover in key staff since approval of the project. AID has had three mission Directors, two Chiefs of Agriculture and Rural Development and three Project Officers. INIPA has had three Directors (including INIA's Director) and three complete changes in top level administrators in research and extension, and project managers. NCSU has had two interim Chiefs of Party, and two Chiefs of Party (involving three different people). Fortunately, the most recent was the research advisor, so some continuity was preserved. UNA has experienced a similar turnover of its key faculty members. The general result has been little continuity in management and a negative impact on smooth working relationships, common understanding of the project, standardized procedures and reporting, effective monitoring, etc. The NCSU campus coordinator and AID's loan officer have provided most of the continuity that exists.

b. AID Management of the project can be improved. (One constraint affecting management has been the flaws noted in the PP, especially the failure of the logical framework to link inputs to project outputs.) There has been little monitoring of contractor performance on the provision of key personnel. There is a need to amend the PP and NCSU's contract to conform with obvious and substantial changes that have been informally approved but that have not been documented. Finally, AID management should be even more purposefully integrative regarding contractor personnel and incorporate them as an element and extension (albeit adjunct) of the OARD staff (significant progress is being made in this regard under the current AID administration, which we fully endorse).

c. NCSU's performance in staffing of long-term positions needs to be improved. The contract identified four long-term advisors that NCSU agreed to provide on January 15, 1982 as key personnel. One position was never filled (education advisor) which we believe has adversely affected the achievement of one of the project outputs (AID shares in the culpability for this as noted above). Very competent substitutes were provided for the other three key positions but only one of the four was filled as of the contract date, and the others were fielded 6 months behind schedule. All long-term advisors have had relatively short tenure under the NCSU REE project. NCSU has provided only 52 of 96 months of long-term technical assistance programmed to date.

3. Recommendations for Proposed Project Extension

a. Develop Management Strategy to Reduce Impact of Personnel Turnover (AID, NCSU, INIPA; July 1984). Meet and develop a management approach to minimize the impact of turnover in key personnel, and to provide for an institutional memory. Consider developing a "common" set

of files and records which are kept up-to-date and available for all to utilize.

b. Provide Long-term Advisors for Minimum of Two Years, with more Timely Replacement (NCSU, upon replacement of long-term staff). Make a special effort to assure longer term involvement of key personnel, and their timely replacement. The team recommends that long-term advisors stay a minimum of two years to reduce costs and assure greater productivity.

Note: Some recommendations which address the problems raised in these conclusions have already been made. See Recommendations A.3.a, b, and c above.

G. INIPA's Growth and Development

1. Accomplishments

a. INIPA has demonstrated considerable growth and development as evidenced by the success of its NPPs, its training effort, its new NPs, the procurement and distribution of equipment and vehicles, the integration of various loans and grants into the Integral REE Program, the RSLs, the effective use of technical assistance, and the integration and linkage to the IARCs. INIPA, however, is a fragile institution very much subject to forces beyond its management control, particularly to the unpredictable political climate, and the generally low priority historically accorded agriculture in the GOP budget.

b. INIPA has an unusually well qualified Director and Deputy Director, and the new Directors of Research and Extension appear to be outstanding scientists and administrators. INIPA has an exceptionally strong set of Leaders and Co-Leaders in the NPPs and excellent technical assistance backstopping from NCSU for both long and short-term assignments. INIPA is developing an Agricultural Economics Program staffed by highly qualified people which should further strengthen the policy and long-term planning process and make the research agenda more relevant to farm realities. Finally, INIPA has strong integral staff support from the CRSPs, the IARCs and other minor donors such as Canada and Switzerland. But, INIPA has an extremely limited human capital base beyond these people, especially at the moment since most of the most capable young professionals (52) are on long-term training.

c. INIPA has shown a capacity to establish priorities by focusing its efforts on the NPPs in the five commodities of most social importance. Moreover, it has already begun to produce significant results in a very short time. Finally, it has expanded into three other areas of significant social importance--the Sierra Program, the Selva Program, and the Agro-economics Program. The expansion into these areas suggests a maturation and sophistication of INIPA since these new

programs basically provide an integrative systems perspective across the principal crops now being emphasized in the five NPPs.

2. Problems

a. INIPA's administrative structure does not provide for clear lines of direction from the Directors of Research and Extension to the CIPA Directors. Moreover, the INIPA Chief and Deputy Chief have more people reporting to them than they can effectively manage. Finally, there appears to be some confusion as to lines of authority in the NPPs and research and extension. In short, the administrative structure of INIPA needs to be modified and streamlined in order to be more functional and efficient.

b. INIPA's budgeting and accounting process is relatively inefficient because a labor-intensive manual accounting system is utilized (computerization currently being implemented should greatly improve the situation). The necessity of keeping separate accounts for the AID, BID, and World Bank (and other minor donors') projects (since each has different accounting requirements and reporting needs) has imposed an additional burden on INIPA.

c. Salaries being paid to INIPA are insufficient to attract and retain well qualified, and highly trained professionals, and the salary supplements may turn out to be a negative influence on the REE system if they are phased out as planned, even with the gradual increase in GOP share over the next three years (The GOP likely will not be able to take over the supplements on schedule because of its severe financial crisis and the likelihood that this crisis will continue for several years). A highly productive modern agriculture is directly dependent on the development of a viable REE system which, in turn, depends on the quality of its staff. It is of utmost importance that adequate salaries be provided for agricultural professionals. Donors and the GOP need to work closely together to assure that salary supplements are maintained, and that the GOP begins to provide competitive salaries as soon as possible--the social returns will amply reward the investment.

3. Recommendations

Section G presented conclusions focused on INIPA's growth and development, but also discussed elsewhere in this Chapter (IV), under two other headings so some pertinent recommendations already have been made. Recommendations which we believe will help INIPA to consolidate its successes and assure a viable Integral REE program are as follows:

a. Develop an Office of International Cooperation and Development (INIPA, NCSU, AID; Highest Priority; Planning 1984, Implementation 1985). Develop an Office of International Cooperation and Development to identify, develop, coordinate and integrate development assistance from private, bilateral, and multilateral donors. The Office could set

criteria for accepting donor assistance and assure that all such support was accepted on terms and conditions consistent with Peru's goals and priorities for research, education, and extension. The Office should also seek domestic sources of independent funding for sustaining INIPA's operations over the longer term.

b. Develop and Implement a Strategy for Educating Peruvians about the High Social Returns to Public Investment in REE (INIPA, NCSU, AID; Highest Priority, 1984). It is urgent that a domestic constituency be developed which supports INIPA and understands the social value of its services. The Jefatura should consider the need to inform the public and build constituency support as among its highest priorities.

END NOTES

- ¹ See AID/W, AID Policy Paper: Food and Agricultural Development, Washington, D.C.: U.S. Agency for International Development, 1982. p. 8.

V. APPENDICES

APPENDIX A

SCOPE OF WORK AND LOGICAL FRAMEWORK

Article III - Statement of Work

In accomplishment of the above, the contractor shall:

A. Provide a four member evaluation team which shall:

1. Review available data concerning the project at the prime contractor's facility in Raleigh, North Carolina.
2. Travel to Peru to undertake the evaluation field work, and prepare the draft report of the evaluation.

The specific responsibilities of each of the team members shall include, but not be limited to, the following:

a. Team Leader.

1. Coordinate activities of the team to insure that the evaluation report is completed in an orderly and timely fashion.
2. Take the lead in assessing the appropriateness of the basic project design or part B.1 of this statement of work. This will involve contacts with Senior Officials within the Ministry of Agriculture as well as with INIPA.
3. Take the lead in assessing the education aspects of the project or part B.2.c. of this statement of work.

b. Research Expert

1. Take the lead in answering the questions raised in part B.2.a. of this statement of work.
2. Become familiar with the total research effort in Peru including the National Agrarian University.
3. Assess the quality of the INIPA research scientists.
4. Evaluate the coordination of assistance to research among the various donors.
5. Evaluate effectiveness of relationship with International Research Centers and other international technical assistance sources.

c. Extension Expert

1. Take the lead in answering the questions raised in B.2.b. of this statement of work.
2. This person should be familiar with the T & V system and have knowledge of its strengths and weaknesses.
3. Evaluate the quality of INIPA extension specialists and sectoristas.

d. Economics Expert

1. Assess the recently developed program for the new agro-economic unit in INIPA and the role of the newly appointed co-leader in agro-economics.

2. Assess the ability of INIPA to analyze farming system data.
3. Assess the ability of INIPA to coordinate economic activities of research and extension personnel.
4. Gather data on GOP economic support to agricultural research and make general conclusion based on international standard.
5. Provide guidance to USAID on Feasibility of developing Ruttan/Drey type study for Peru.

B. Prepare a report of the evaluation which shall at a minimum contain responses to the following questions and statements:

1. Appropriateness of basic project design

-Is research under the National Commodity Programs focusing on important and solvable problems and are the problems relevant to feasible on-farm improvements needs and potential? Have the constraints to increased agriculture production been properly identified with the areas of research and extension?

-Are research and extension strategies the most appropriate to bring about improved performance in the sector?

-Is extension delivering an appropriate message and is it being accepted?

-Is the adoption of existing Agriculture technology being properly addressed?

-Are research, extension and education priorities appropriate given needs and strategy of GOP?

-To what extent has the National Commodity Program approach been institutionalized in the INIPA Management Process?

-Is mix of commodity programs appropriate or should some crops receive more attention and others less? Have some high potential areas of research been avoided or neglected?

-Is training program sufficient to meet the future needs of the agriculture sector?

-Is original project design relevant given the unanticipated entrance of two other major donors? Ascertain if the designs of the three projects are complementary, or if there are areas of inconsistency.

-What effect have actions, external to the project, had on research and extension priorities? Examples of such actions include price controls, the drought in the South and the floods in the North and the availability of farm credit.

-Will the training program increase the capability of Peru to implement the agricultural assistance program of A.I.D. and other bilateral and international donors?

2. Effectiveness of project activities in accomplishing project objectives.

Compare progress achieved by the project in each of the seven project components with objectives identified in the Project Paper and provide the specific information requested below. The requests for information under each heading have been prioritized according to importance (Question No. 1 under each heading is most important). More contract time should be spent on those questions of most importance.

a. Research

-Describe and quantify, to the extent possible, accomplishments to date in each commodity program.

-Relate accomplishments to demonstrated/expected increases in yield and/or production.

-Review planning documentation for 1984 campaign.

-Describe progress of project in dealing with crop research needs and the degree of interrelationship among commodity research programs where appropriate.

-Assess ability of INIPA to carry out current research program. Should scope of research program be more narrowly (broadly) defined.

-Assess adequacy of technical agronomic and economic supporting data for recommended practices.

-Assess adequacy of procedures for identifying research topics and how well research problem selection criteria reflect farmers needs, physical, manpower and financial resource bases and established agricultural practices.

-Assess linkage between INIPA and international research system, university and private sector research organizations.

b. Extension

-Are adequate numbers of farmers being reached? Assess validity of selection of T & V system for Peru over other systems.

-Assess the overall effectiveness of the extension component in support of project objectives. This assessment should include the the number and qualifications of sectoristas per CIPA, the number of contact farmers per sectorista, frequency

and duration of visits by sectoristas to contact farmers, visits by contact farmers to other farmers, number and type of demonstration plots established and the use made of the demonstration plots.

-Assess linkage between agricultural research and extension i.e. preparation of technical reports, dissemination of reports, participation of extensionists with research, etc.

-Assess the adequacy and effectiveness of feed back and verification systems for identifying actual farmer usage of recommendations.

-Do extensionists learn from farmers?

-Comment on the capability of the extension section to produce relevant messages and their use of training aids.

-Are there constraints which might keep farmers from applying extension recommendations?

-Are extensionists "selling" packages that are too advanced to be implemented by the smallest farmers?

-Is there any interaction between INIPA and private sector extension services and how, if necessary, could this interaction be strengthened?

c. Education

-Assess objectives and adequacy of the training plan prepared by project personnel.

-Assess effectiveness of in-service training at all levels within INIPA, but especially at the sectorista level. Is the training part of T & V meeting the needs of the sectoristas.

-Assess appropriateness of subject material for participants. Will participants meet future needs of INIPA?

-Assess ability of project staff to find and process qualified candidates for training and assess performance of participants.

d. Administration

-Comment on the nature and adequacy of the management decision making process.

-Assess the effectiveness of the administrative and management support systems including monitoring, budgeting, liquidation of advances, reporting and commodity procurement.

-Assess, to the extent possible, the effectiveness of the GOP, USAID and the North Carolina State University technical assistance group in supporting project objectives.

3. An appraisal of the progress achieved by INIPA in developing the capability to carry out its functions.

-Describe briefly the status of research and extension prior to 1981, the history of INIPA since 1981 and how the capability of INIPA has expanded. Has INIPA been more successful in some parts of its mandate and in some parts of the country. If so, why?

-Evaluate the quantity and quality of INIPA staff i.e. have all core positions at central HQ and at the CIPAS been filled with qualified people.

-Assess the management effectiveness of INIPA in the areas of:

- a. Budgeting and rendering of accounts
- b. Field supervision
- c. Planning implementation and evaluation
- d. Commodity procurement

-Assess the ability of INIPA to use the contract assistance team effectively.

-Assess INIPA's ability to coordinate roles of multiple donors, International Centers, the National Agrarian University in support of community program.

-Assess the current procedures and adequacy of INIPA to coordinate research, extension and education needs e.g., do extensionists know what researchers are doing and do they report on field results and help identify research problems.

-Assess INIPA's ability to support other agricultural projects e.g. soil conservation, selva development, irrigation, etc.

-Assess adequacy of GOP budgetary support to INIPA and pre-INIPA Institution.

-Assess the progress that INIPA has made in tailoring research and extension to the agroclimatic and socio economic conditions in the country i.e. to what extent has INIPA accommodated its priorities and style of operation to the variety of conditions which exists in Peru.

4. Identify and assess of the principal problems and constraints impeding the achievement of project objectives and identify alternative solutions to these problems.

5. Based on the information obtained from the questions raised above, provide a revised recommended implementation plan for the remainder of the project.

Article IV - Reports

The report of the evaluation to be presented in English and Spanish shall contain the following sections:

- a. Executive Summary (two pages, single space including statement of purpose of A.I.D. project reviewed and of the evaluation)
- b. Project Background
- c. Statement of major findings and recommendations
- d. Body of report which includes a description of the various observations and which provides the information on which major findings and recommendations were based. The report should not exceed 75 pages.
- e. Appendices as necessary including evaluation scope of work, statement of methodology used and separate team members reports.
- f. A draft report shall be presented to A.I.D. before the team leader departs Peru with a final report to be presented within five weeks after his departure from Peru.

Article V - Relationships and Responsibilities

The contractor shall work under the general policy guidance of the Director, USAID/Peru and in collaboration with the Chief of the Office of Agriculture and Rural Development (OARD), USAID/Peru or his designee. A.I.D. liaison officials are:

Mr. David Bathrick, Chief, OARD, USAID/Peru
Mr. J. David Flood, Chief, Agricultural Development Division,
USAID/Peru
Mr. Timothy J. Miller, Project Manager, AGR, USAID/Peru

Cooperating Country Liaison Official

Dr. Victor Palma, Chief, National Agriculture Research and Extension Institute (INIPA)

Article VI - Term of Performance

The desired starting date is January 6, 1984 and the estimated completion date is April 6, 1984.

10 10.0-2011-721

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 82 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 GOP. 3. Adequate pricing policy for resource inputs and commodity outputs and maintenance. 4. Political stability prevails.

106

<p>Project Purpose:</p> <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>	<p>Conditions that will indicate purpose has been achieved: End of project status.</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. 	<p>For 1 to 5</p> <ul style="list-style-type: none"> - 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. 	<p>Assumptions for achieving purpose:</p> <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:		Assumptions for achieving outputs:
<ol style="list-style-type: none"> 1. National NPP Management Unit. 2. National Extension 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. 	<p>For 1 to 9</p> <ul style="list-style-type: none"> - 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.

108

Inputs: Investment Categories	Implementation Target (Type and Quantity) (In Thousands of U.S. Dollars)					Grand Total	GOP and USAID accounting records.	Assumptions for providing inputs: 1. GOP complies with conditions precedent. 2. The GOP provides the pertinent budget allocation for the Project.
	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		

Scope of Work

Background

The purpose of the Agricultural Research, Extension and Education project (527-0192) is to create an agricultural research, extension and education system (REE) that will enable the National Institute of Agricultural Research and Extension (INIPA) to: (a) increase agricultural production and (b) provide for a continual flow of varying levels of technology to agricultural producers. Project components are the formation of: (1) five national commodity programs (NPPs) for corn, rice, potatoes, small grains, and grain legumes; (2) six regional service laboratories; (3) five regional research centers; (4) a national research support unit; (5) an education program for professional and technical training; (6) a national REE management division; and (7) a coordinated selva program.

The project agreement was signed in August, 1980. In late 1980, the GOP began studying a plan to reorganize the Ministry of Agriculture and to combine the National Agricultural Research Institute (INIA) with the National Extension Service. In July 1981, this change was effected with the creation of INIPA. During the period of time when the plan was under study, as well as for the twelve previous years, activities in research, education and extension were at a virtual standstill. In January 1982 a technical assistance contract was signed with North Carolina State University and the TA team begin working in Peru in August 1982.

Article I - Title

Mid term Evaluaton - Agricultural Research, Extension and Education Project (527-0192).

Article II - Objective

The objective of this work order is to obtain an assessment of the appropriateness of the basic project design, the effectiveness of project activities particularly technical assistance in carrying out project objectives, the progress achieved by INIPA in developing the capability to carry out its functions, and the identification of the principal problems and constraints impeding achievement of project success and alternative solutions to the problems identified. The report of the evaluation will provide a record of what has transpired, and make recommendations for adjustments in project design, changed emphasis and improved procedures when warranted. Finally, the evaluation report will include a recommended revised implementation plan for the remainder of the project.

APPENDIX B

EVALUATION METHODOLOGY

Evaluation Methodology

This appendix sets forth the method utilized by the team to evaluate the AID Research, Extension, and Education Project, and draw conclusions about the viability and success of the project.

The evaluation is the mid-term evaluation of the project as called for in the Scope-of-work, see Appendix A, and USAID Peru's evaluation schedule. This is the first formal evaluation of the project although the project paper called for annual evaluations.

The evaluation was carried out by a five-person evaluation team. USAID/Peru requested BIFAD (in June 1983) to identify candidates for an evaluation team and suggested Dr. Morris Whitaker serve as team leader. Other positions included a research specialist, an extension specialist, an agricultural economist, and a research management specialist. The USAID Mission formally requested (in December 1983) an IQC contractor to assemble four members of the team (Drs. Whitaker, Dan Galvan--Extension, David James--Research, and George Norton--Agricultural Economist) while USAID contracted directly for the services of Jose Valle-Riestra--the Research Management Specialist.

The evaluation was carried out by this independent, outside evaluation team, in full conformance with AID evaluation procedures.¹ The Scope-of-work was developed by USAID/Peru, in collaboration with INIPA, and NCSU. The general terms of reference was expanded at the request of the evaluation team to include the logical framework of the project paper.² These two documents, presented in Appendix A comprise the terms of reference against which this evaluation was made.

USAID/Peru's project officer (Mr. Timothy Miller) served as an ex-officio member of the evaluation team, again in full conformance with AID evaluation procedures.³ The work itinerary of the evaluation team had been prepared by Mr. Miller in consultation with INIPA and NCSU prior to the team's arrival. The schedule was modified to allow for greater division of labor among team members and greater flexibility. Each team member was provided with copies of key project documents including the project paper, NCSU's contract and associated reports, the Baseline Study, and the Report of the Presidential Agricultural Mission to Peru among others. In addition, the team was provided with numerous reports, copies of correspondence etc. related to various elements of the project

¹See USAID, AID Evaluation Responsibilities & Procedures, p. 211-64.

² In accord with AID evaluation procedures, the logical framework is an important reference document. See Ibid., p. 215.

³ AID evaluation procedures allow for a project officer to serve as a member of an evaluation of one of his projects. See Ibid. p. 219.

(secondary material reviewed for this evaluation is cited in the Literature Reviewed Section at the end of this report).

Thus, the team was asked by USAID to respond to a set of questions and issues raised in the scope of work. In addition, the team under general AID evaluation guidelines, had the responsibility to determine the degree to which project purpose was being realized by determining the degree to which project inputs were being provided, and outputs were coming on stream (as programmed in the logical framework).

The methodological approach to answer these questions and make these judgements about progress was to utilize: (1) primary sources (a series of open-ended interviews with key project personnel); and (2) secondary sources (the various project-related reports, correspondence and other documents) as a basis for substantive data and evidence, and for the conclusions which we drew. The evaluation was carried out in Lima, and various other field sites during the period 1/7/84 - 2/4/84.

The general approach for gathering primary data was a series of interviews with personnel from NCSU, INIPA, AID, World Bank, UNA, BID, and MAF. Interviews ranged from formal meetings with the entire team, to special briefings, to one-on-one meetings, to meetings with only part of the team (the various interviews are set forth in Attachment B.1). In every case, the team, or team members had specific questions and concerns. The basic focus was on: (1) getting data for answering the questions in the scope of work; and (2) determining the quality of project inputs that were supplied and on how timely a basis, the degree to which outputs were coming on stream, and the extent to which project purpose was being achieved. Follow-up interviews were scheduled, and additional secondary data requested after initial meetings as necessary.

Preliminary conclusions were shared with NCSU, and INIPA, AID, and the Minister of Agriculture about mid-term in the evaluation and provided valuable feedback. In addition, copies of draft chapters were shared with key people from INIPA and NCSU (with AID approval), as well as with AID, which eliminated a number of errors of fact and interpretation, and provided a basis for strengthening and improving the evaluation report.

The team was remarkably unified in its findings. There was a consensus of opinion on major conclusions and recommendations. All team members made major contributions to writing various sections of the report, and to editing the entire final report. The final edition was completed at Logan, Utah, by Dr. Whitaker and incorporates comments from all the other team members, and from INIPA, AID, and NCSU.

Attachment B.1. List of Interviews

<u>Date</u>	<u>Place</u>	<u>Name</u>	<u>Organization</u>	<u>Position/Office</u>	<u>By</u>
1-09-84	Lima	John Sanbrailo George Wachtenheim	AID	Director & Loan Officer	Team
1-09-84	Lima	David Bathrick Tim Miller	AID	Ag. Officer Project Officer	Team
1-09-84	Lima	Victor Palma & Alfredo Montes	INIPA	Chief & Deputy	Team
1-09-84	Lima	Fernando Ezeta, W. Caballero, & B. Quijandria	CIP INIPA	Co-Leader-NPP/P Leader, Agroeconomic/P Small Ruminants CRSP	Team Team Team
1-10-84	Lima	H. Madueno & G. Cueva	INIPA	Office of Planning	Team
1-10-84	Lima	J. Espino, L. Scarneo, C. Pezzet	INIPA INIPA	Office of Administration	Team
1-10-84	Lima	Dale Bandy, Art Courtu, George Naderman, Frank Smith and Carlos Pomareda	NCSU	Tech. Assistance Team	Team
1-11-84	Lima	Carlos Bohi	World Bank	Proj. Coordinator	Team
1-11-84	Lima	Pablo Pera Masuda	BID INIPA	Actng. Project Coordinator Liasion Officer with BID	Team
1-11-84	Lima	Hugo Villachica	REDINAA	Exec. Director (Acting)	Team
1-11-84	Lima	Benjamin Quijandria	INIPA	Small Ruminants CRSP	Team
1-11-84	Lima	Jack Thrower	AID	Executive Officer	Team
1-11-84	Lima	Tim Miller	AID	Project Officer	AID
1-12-84	La Molina		UNA		James

<u>Date</u>	<u>Place</u>	<u>Name</u>	<u>Organization</u>	<u>Position/Office</u>	<u>By</u>
1-12-84	Lima	M. Garcia	CESPAC		Galvan
1-12-84	Lima	Danny Cruz	AID	Eval. Officer	Whitaker
1-12-84	Lima	W. Caballero, & C. Pomareda	INIPA, NCSU	Coordinator, Advisor	Whitaker, & Norton
1-12-84	Lima	Alejandro Wiese, Luis Ramirez	INIPA	Consultant	Whitaker Norton, and Valle-Riestra
1-12-84	Lima	Joel Busel	Tahal (Israel)	Extension Adv.	Team
1-12-84	Lima	NCSU team (as above)	NCSU	Tech. Assistance team	Team
1-13-84	Yurimaguas	McCullom	NCSU	Research Advisor, Trop. soils CRSP	Team
1-13-84	Yurimaguas	Javier Alva Ruben Mecia	EEY EEY	Research Worker Extension Agent	Team
1-14-84	Tupac Amaru	Lucho Perez	—	Farmer	Team
1-14-84	Yurimaguas	Jose Benitez	EEY	Research Worker	Team
1-14-84	Yurimaguas	Tim Miller	AID	Project Officer	Team
1-15-84	Valle Huallaga Central	Saavedra	—	Farm Family	Team
1-15-84	Valle Huallaga Central	Flores		Farmer	Team
1-16-84	E.E. El Porvenir (Near Tarapoto)	Jose Hernandez, Ed Pulver Ing. Panta	INIPA	Leader & Co- leader, NPP/Rice Ing. Agronomo	Team
1-16-84	E.E. El Porvenir	Manuel A. Osoros	CIPA X	Ext. Supervisor	Galvan
1-16-84	E.E. El Porvenir	Ing. Sandoval	CIPA X	Ext. Zone Superv.	Galvan
1-16-84	E.E. Nuevo Caja- marca (near Rioja)	Gamaniel Villegas Ing. Antonio Lopez	CIPA X	Zone Extension Director, Sub- Estacion Exp.	James, Galvan, Whitaker
1-16-84	Nuevo Cajamarca	Regulo Diaz	—	Farmer	Whitaker, James, Galvan
1-16-84	Nuevo Cajamarca	Alcides Zarata	CIPA X	Extension Agent	Whitaker, Galvan, James

<u>Date</u>	<u>Place</u>	<u>Name</u>	<u>Organization</u>	<u>Position/Office</u>	<u>By</u>
1-16-84	Moyobamba	Victor Palma Arthur Courtu Dale Bandy	INIPA NCSU NCSU	Chief Campus Coordinator Chief of Party	Whitaker, James, Galvan
1-16-84	Nuevo Cajamarca	Timoteo Culqui	—	Farmer	Whitaker, James, Galvan
1-16-84	Tarapoto	Giovani Falcon Francisco Vasquez	CIPA X CIPA X	Administrator Accountant	Valle-Riestra & Miller
1-17-84	E.E. El Porvenir	Washington Lopez	CIPA X	Research Superv.	Valle-Riestra
1-17-84	E.E. El Porvenir	Luis Naro, F. Scheuch	INIPA, CYMYT	Leader and Co- leader NPP/corn	Team
1-17-84	E.E. El Porvenir	Several Farmers at field day	—	—	Various
1-17-84	Tarapoto	Victor Palma	INIPA	Chief	Whitaker
1-17-84	Tarapoto	Tim Miller	AID	Project Officer	Team
1-18-84	Tarapoto	Cesar Flores	CIPA IO	Director	Team
1-18-84	Tarapoto	Sandoval	CIPA IO	Extension Zone Director	Team
1-18-84	Tarapoto	?	CIPA IO	Research Director	Team
1-18-84	Tarapoto	Luis Medrano, Frank Dall	IETEL	Advisor Advisor	Team
1-18-84	Tarapoto	Hugo Soplin V.	UNA	Dept. Plant Science	James
1-18-84	Tarapoto	Gerardo Villalva Ing. Agron	UNA	Graduate Student	James
1-19-84	Lima	Juan Carlos Hurtado M.	MAF	Minister	Team
1-20-84	Lima	David Flood	AID	Ag. Officer	Whitaker
1-21-84	E.E. Chincha	Ricardo Rodriguez	CIPA VI	Director	James, Norton
1-21-84	E.E. Chincha	Silva	CIPA VI	Director E.E.	Galvan
1-21-84	E.E. Chincha	Lous Ramirez	CIPA VI	Extension Zone Director	
1-23-84	E.E. La Molina	M. Cano	CIPA V	Director, NSLs	Team
1-24-84	E.E. La Molina	T. Alvarez	INIPA	Director Oficina de Comunicacion Tecnica	Galvan, Norton

<u>Date</u>	<u>Place</u>	<u>Name</u>	<u>Organization</u>	<u>Position/Office</u>	<u>By</u>
1-24-84	E.E. La Molina	M. Olivera	INIPA	Spec. in Training	Galvan, Norton
1-24-84	CIP Hq.	R. Sawyer	CIP	Director General	Team
1-24-84	La Molina	Nicolas Rodriguez	UNA	Grad. Student in Nutrition	James
1-24-84	La Molina	Sergio Contreras L.	UNA	Grad. Student in Plant Breeding	James
1-24-84	La Molina	Emma Manco	UNA	Grad. Student in Agronomy	James
1-24-84	La Molina	Luis Gomero O.	UNA	Grad. Student in Soils	James
1-25-84	CIPA XII Hq.	Carlos Escobar	CIPA XII	Director	James, Galvan
1-25-84	E.E. La Molina	F. Ezeta	INIPA	Leader Potato NPP	James, Galvan
		Cesor Vitlorelí	CIP/INIPA	Leader National Potato Seed Production Program	
1-25-84	CIPA XII Hq.	Vidal Nino	CIPA XII	Ext. Supervisor	Galvan
1-25-84	CIPA XII Hq.	Manuel Herrera R.	CIPA XII	Director Zona de Extension	Galvan
1-25-84	CIPA XII Hq.	Uriel Vasquez G.	CIPA XII	Zone Spec. in Potatoes	Galvan
1-25-84	CIPA XII Hq.	Jose Carpio V.	CIPA XII	Zone Spec. in Cereals	Galvan
1-25-84	Lima	Fred Mann	AID	Ag. Economist (JCC)	Whitaker
1-26-84	Lima	Gegor Quispe	INIPA	Budget, Director	Valle-Riestra
1-26-84	Lima	Guillermo Cuevas	INIPA	Studies and Projects Director	Valle-Riestra
1-26-84	Lima	Tedy Panita	INIPA	Deputy Director of Administration	Valle-Riestra
1-26-84	Lima	Adolfo Avila	INIPA	Financial Analyst	Valle-Riestra
1-26-84	Lima	Cesar Pezet	INIPA	Future Director of Administration	Valle-Riestra
1-26-84	Lima	Hugo Pacheco	INIPA	Past-REE Coordinator	Valle-Riestra
1-26-84	Lima	David Bathrick	AID	Chief, OARD	Whitaker

<u>Date</u>	<u>Place</u>	<u>Name</u>	<u>Organization</u>	<u>Position/Office</u>	<u>By</u>
1-26-84	Lima	David Flood	AID	Ag. Officer	Whitaker
1-27-84	Lima	Dale Bandy	NCSU	Head of Mission	Valle-Riestra
1-27-84	Lima	Dale Bandy Geo Naderman Art Coutu	NCSU	Advisors	Whitaker
1-28-84	CIPA XIV Hq.	Adriel Villena	CIPA XIV	Director	Galvan, Norton
1-28-84	CIPA XIV Hq.	Hernan Cucho	CIPA XIV	Director E.E. Cuzco	Galvan, Norton
1-28-84	CIPA XIV Hq.	Cesar Monge	CIPA XIV	Director of Ext. Zone	Galvan, Norton
1-28-84	CIPA XIV Hq.	Guido Calderon	INIPA	Leader of Israel's NPP	Galvan, Norton
1-28-84	Univ. Nacional San Antonio ABAD (Granja Kayra)	Oscar Blanco	Centro de Inves- tigacion en Cul- tivos Andinos	Director del Centro	Galvan, Norton
1-30-84	Lima	David Flood	AID	Ag. Officer	Whitaker
1-31-84	Lima	Fred Mann	AID	Ag. Economist	Whitaker
1-31-84	Lima	Hugo Galves P.	Dept. of Irri.	Director, Plan MERIS I	James
1-31-84	Lima	Wilfredo Saramento,	Dept. of Irri.	Position Coordinator, Plan MERIS I	James
1-31-84	Lima	Luis Haro V.	Dept. of Irri.	Director, Ag. Development	James
2-1-84	Lima	Victor Palma Dale Bandy Arthur Coutu	INIPA NCSU NCSU	Chief Chief of Party Campus Coordinator	Whitaker Valle-Riestra
2-1-84	Lima	Tim Miller	AID	Project Officer	Whitaker
2-1-84	Lima	Douglas Arnold	AID	Comptroller	Norton
2-2-84	Lima	AID Mission Staff	(Report on Evaluation)		Team
2-2-84	Lima	INIPA Staff	(Report on Evaluation)		Team
2-2-84	Lima	Juan Carlos Hurtado M.	MAF	Minister (Report on Evaluation)	Team
2-3-84	Lima	Victor Palma	INIPA	Chief	Whitaker

<u>Date</u>	<u>Place</u>	<u>Name</u>	<u>Organization</u>	<u>Position/Office</u>	<u>By</u>
2-3-84	Lima	David Bathrick Tim Miller	AID	Chief OARD Project Officer	Whitaker
2-3-84	Lima	Dale Bandy Arthur Coutu	NCSV	Chief of Party Campus Coordinator	Whitaker
2-3-84	Lima	Douglas Arnold	AID	Comptroller	Norton

APPENDIX C

DATA ON INTEGRAL REE PROGRAM

MODIFICACIONES MAYO 31, 1983

ASIGNACION DE FUENTES DE FINANCIACION
POR CIPAS Y PROGRAMA NACIONAL

Siglas

A = Programa Nacional de Arroz
C = Programa Nacional de Cereales
LG = Programa Nacional de Leguminosas de Grano
M = Programa Nacional de Maíz
P = Programa Nacional de Papa

BM = Banco Mundial
IEE = Proyecto IEE-AID
BID = Proyecto Sectorial BID
PEAH= Proyecto Especial Alto Huallaga
PEAM= Proyecto Especial Alto Mayo
PEPP= Proyecto Especial Pichis Palcazu

EE = Estación Experimental
SEE = Subestación Experimental
CE = Campo Experimental
EP = Especialista de Promoción por Zona
AE = Agencia de Extensión
LRS = Laboratorio Regional de Servicio
LC = Laboratorio Central

ASIGNACION DE FUENTES DE FINANCIACION POR CIPAS Y PROGRAMA NACIONAL

CIPA	UNIDAD	Programa Nacional	Fuente de Financiamiento
I			
	FE Mallares	A,M	BM
	SEE Los Cedros	A,M	BM
	SEE Huancabamba	M,C,P,LG	BM
	EP Piura-Arroz	A	BM
	EP Piura-Maíz	M	BM
	EP Tumbes-Arroz	A	BM
	EP Tumbes-Maíz	M	BM
	AE Tumbes	A,M	BM
	AE Partidor	A	BM
	AE Sullana	A,M	BM
	AE La Unión	A	BM
	AE Morropón	A	BM
	AE Bernal	A	BM
	AE Marcavelica	M	BM
	AE Chulucanas	M	BM
	AE Crucetas	M	BM
	AE Corrales	M	BM
	AE Pueblo Nuevo	M	BM
	AE Malingas	M	BM
	AE Huancabamba	M,C,P,LG	BM
	AE Chalaco	M	BM
	AE Sto. Domingo	M	BM
II			
	EE Vista Florida	A,LG	BM
	SEE Bagua	A	BM
	EP Lambayeque-Arroz	A	BM
	EP Lambayeque-Leguminosas	LG	BM
	AE Chiclayo	A	BM
	AE Chongoyape	A	BM
	AE Ferreñafe	A,LG	BM
	AE Zaña	A	BM
	AE Motupe	LG	BM
	AE Mochumi	LG	BM
	AE Jayanca	LG	BM
	LCS Vista Florida		BM

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
III			
	EE Viru	P, LG	BM
	EE Huamachuco	P, M	BM
	SEE Jequetepeque	A, LG	BM
	SEE Otuzco-Chota		
	Motil	P, C	BM
	SEE Paiján	LG, C	BM
	EP Trujillo-Arroz	A	BM
	EP Trujillo-frijol	LG	BM
	EP Trujillo-		
	Cereales	C	BM
	EP Huamachuco-		
	Papa	P	BM
	AE Chepén	A, LG	BM
	AE San Pedro	A	BM
	AE Chicama	A, LG	BM
	AE Viru	LG	BM
	AE Stgo. de Chuco	P, M, C, LG	BM
	AE Otuzco	P, M, C	BM
	AE Tayabamba	C	BM
	AE Huamachuco	P, C, M	BM
	AE Coina	C, LG	BM
	AE Julcan	P, C	BM
	AE Trujillo	LG	BM

IV

	EE Malpaso	C, LG, P, M	BM
	SSE Huari	C, P, M	BM
	EP Huaraz-papa	P	BM
	EP Huaraz-cereales	C	BM
	EP Huaraz-maiz	M	BM
	EP Conchuco-maiz	M	BM
	EP Conchuco-cereales	C	BM
	EP Chimbote-maiz		
	Leguminosas	M, LG	BM
	AE Huaraz	C, P, LG, M	BM
	AE Caraz	M	BM
	AE Carhuaz	P, M, C	BM
	AE Cabana	M, C	BM
	AE Chavín	P, C	BM
	AE Huari	P, C, M	BM
	AE Chiquián	P, C	BM
	AE Chimbote	A, M, LG	BM
	AE Casma	M	BM
	AE Huarmey	M	BM
	LRS/Huaraz	-	BM

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
V			
	EE La Molina	P	IEE
	SEE Donaso	P,C,LG	IEE
	EE Cañete	P,LG	IEE
	SEE Ate	P	IEE
	EP Lima-papa	P	IEE
	EP Cañete-papa- leguminosas	P,LG	IEE
	EP Huacho-papa- leguminosas	P,LG	IEE
	EP Huacho-cereales	C	IEE
	AE Canta	P	IEE
	AE Cañete	P,LG	IEE
	AE Huacho	P,LG,C	IEE
	AE Barranca	LG,P	IEE
	AE Huaral	LG,C,P	IEE
	LC Lima		IEE

VI			
	EE Chincha	LG,P	IEE
	EE Ica	LG,C,P	IEE
	EP Chincha-leg	LG	IEE
	EP Ica-legum	LG	IEE
	AE Chincha	LG,P	IEE
	AE Ica	LG,P	IEE
	AE Castrovirreyna	P,C	BID
	AE Santiago	LG	IEE
	AE Las	LG	IEE

VII			
	EE San Camilo	P	BID
	SEE Tambo	A	BID
	SEE Majes	A	PR
	SEE Aplao	A	BID
	SEE Camaná	A,LG	BID
	SEE Chuquibamba	P	BID
	SEE Sta. Rita de Sihuas	-	BID
	SEE Cerro Juli	-	BID
	EP Aplao-arroz	A	BID
	EP Aplao-legum	LG	BID
	EP Camana-arroz	A	BID
	EP Camana-legum	LG	BID

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
VII			
	AE Arequipa	P	BID
	AE Cocachacra	A	BID
	AE Aplao	LG,A	BID
	AE Camaná	LG,A	BID
	AE San Isidro	-	BID
	AE Chivay	-	BID
	AE Pampacolca	P	BID
	AE Chuquibamba	P	BID
	AE Acari	-	BID
	AE Caraveli	-	BID
	LRS Arequipa		BID

VIII

	EE Tacna (La Yarada)	P	BID
	SEE Moquegua	-	BID
	SEE Tarata	P	BID
	SEE Omate	P	BID
	EP Moquegua-papa	P	BID
	EP Tacna-papa	P	BID
	AE Tarata	P	BID
	AE Carumas	P	BID
	AE Moquegua	-	BID
	AE Omate	-	BID
	AE Sama	-	BID
	AE Tacna	-	BID

IX

	EE Cajamarca	M,C,P	BM
	SEE Cajabamba	M,C,LG, P	BM
	SEE Jaén	A,M,LG	BID
	SEE Chota	P,M,LG	BM
	EP Cajamarca-maiz	M	BM
	EP Cajamarca-cereales	C	BM
	EP Cajamarca-papa	P	BM
	EP Cajamarca-leg	LG	BM
	EP Jaén-arroz	A	BID
	EP Jaén-maíz	M	BID
	AE Jaén	A,M,LG	BID

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
IX (continuación)			
	AE Tamborapa	A	BID
	AE Pucará	A,M	BID
	AE San Ignacio	A,M	BID
	AE Sto. Tomás	A,M	BID
	AE Cajamarca	P,M,C	BM
	AE Cajabamba	C,LG,M,P	BM
	AE Celendín	M,C	BM
	AE Chilete	M,A,LG	BM
	AE Chota	P,M,LG	BM
	AE Cutervo	P,M	BM
	AE Sta. Cruz	P,M	BM
	AE San Marcos	M,C	BM
	AE San Miguel	C	BM
	AE Contumazá	P,C,M	BM
	AE Bambamarca	P,M	BM
	AE Quiracas	M	BM
	AE Yanayacu	M	BM
	AE Catillac	-	BM
	LRS Cajamarca	-	BM

X

	EE El Porvenir	A,M,LG	IEE
	EE Alto Mayo	A,M	PEAM
	SEE Huarangopampa	A,M,LG	BID
	SEE Luya	M,LG	BID
	EP Tarapoto-arroz	A	IEE
	EP Tarapoto-maiz	M	IEE
	EP Moyobamba-arroza	A	PEAM
	EP Moyobamba-maiz	M	PEAM
	EP Bagua Grande-arroz	A	BID
	EP Bagua Grande-maiz	M	BID
	AE Bagua Grande	A,LG,M	BID
	AE Bagua Chica	A,LG,M	BID
	AE Chachapoyas	LG,M	BID
	AE Pomacochas	LG,M	BID
	AE Luya	LG,M	BID
	AE Rodríguez de Mendoza	LG,M	BID
	AE Sto. Tomás	LG,M	BID
	AE Rioja	A	PEAM
	AE Nvo. Cajamarca	A	PEAM
	AE Moyobamba	A,M	PEAM

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
X (continuación)			
	AE Tarapoto	A,M,LG	IEE
	AE Bellavista	A,M	IEE
	AE Juanjuí	A,LG,M	IEE
	AE Bajo Huallaga	A,M	IEE
	AE Pucacaca	A,M	IEE
	AE Tocache	A	PEAH
	AE Rio Uchiza	A,M	PEAH
	AE Biavo	M	IEE
	AE Bs. Aires	M	IEE
	AE Saposoa	M	IEE
	AE Juan Guerra	M	IEE
	AE Ponaza	M	IEE
	AE San José de Sisa	M	IEE
	LRS	-	IEE

XI

	EE Tulumayo	A,M,LG	PEAH
	SEE La Divisoria	M	PEAH
	EE Canchan	P,M	BID
	SEE Quisca	P,M	BID
	EP Pasco-papa	P	BID
	EP Huánuco-papa	P	BID
	EP Huánuco-maíz	M	BID
	EP Tingo María-arroz	A	PEAH
	EP Tingo María-maíz	M	PEAH
	AE Huánuco	P,M	BID
	AE La Unión	P,M	BID
	AE Pano	P	BID
	AE Llata	P	BID
	AE Pasco	P	BID
	AE Yanahuanca	P	BID
	AE Tingo María	A,M,LG	PEAH
	AE Aucayacu	A,M,LG	PEAH
	AE Pucayacu	A,M,LG	PEAH
	AE La Morada	A,M,LG	PEAH
	AE Baños	P	BID
	AE Pto. Inca	A,M	BID
	LRS Tingo María	-	PEAH

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
XII			
	EE Sta. Ana	P,M,C,LG	IEE
	SEE Pichanki	M,A,LG	PEPP
	SEE Pto. Bermudez	A,M,LG	PEPP
	EP Huancayo-papa	P	IEE
	EP Huancayo-maiz	M	IEE
	EP Huancayo-cereales	C	IEE
	EP San Ramón-maíz	M	PEPP
	EP San Ramón-arroza		PEPP
	AE Churcapampa	P,LG	IEE
	AE Izcuchaca	P,LG	BID
	AE Pampas	P,M,LG	BID
	AE Huancayo	P,M,LG	IEE
	AE Chupaca	P,C,LG	IEE
	AE Comas	P,M	IEE
	AE Jauja	P,C	IEE
	AE Tarma	P,M,LG	IEE
	AE Concepción	P,C,LG	IEE
	AE Acobamba	P,M,C,LG	BID
	AE Huancavelica	P	BID
	AE Lircay	P,C	BID
	AE San Ramón	M	PEPP
	AE Oxapampa	M,P	PEPP
	AE Satipo	A,M	PEPP
	AE Pichis	A,M,LG	PEPP
	AE Palcazu	A,M,LG	PEPP
	AE Huasahuasi	P	IEE
	LRS Huancayo	-	IEE

XIII

	EE Canaan	C,M,LG,P	BID
	SEE Sivia	LG,M	BID
	EP Ayacucho-maiz/cereales	M,C	BID
	EP Ayacucho-leg/papa	LG,P	BID
	EP Cora Cora-papa	P	BID
	AE Ayacucho	C,M,P	BID
	AE Quihua	C	BID
	AE Huanta	LG,M	BID
	AE La Mar	LG	BID
	AE Cangallo	C,P	BID
	AE Huancosancos	-	BID

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
XIII (continuación)			
	AE Pichari	-	BID
	AE Sta. Rosa	-	BID
	AE Cora Cora	P	BID
	AE Puquio	P,C	BID
	AE Saras	-	BID
	AE Cabana	-	BID
	AE Pansa	-	BID

XIV

	EE Andenes	P,C,M,LG	BID
	SEE Chuquibamba	C,M,LG	BID
	SEE Kosñipata	A,M	BID
	SEE Mollepata	LG	BID
	SEE Sahuayacu	M	BID
	EP Cuzco-cereales	C	BID
	EP Cuzco-maíz	M	BID
	EP Cuzco-papa	P	BID
	EP Cuzco-Leg	LG	BID
	EP Abancay-ce- reales	C	BID
	EP Abancay-papa	P	BID
	EP Abancay-maíz	M	BID
	EP Abancay-Leg	LG	BID
	LRS Cuzco		BID
	AE Anta	P,C,LG,M	BID
	AE Cuzco	P,C,M	BID
	AE Paruro	P,C	BID
	AE Urcos	C,M	BID
	AE Calca	C,M,LG	BID
	AE Urubamba	C,M,LG	BID
	AE Paucartambo	P,C	BID
	AE Acomayo	P,C	BID
	AE Quillabamba	LG,M	BID
	AE Alto Urubamba	-	BID
	AE La Quebrada	LG	BID
	AE Sicuani	P,C,M	BID
	AE Sto. Tomás	P,C	BID
	AE Andahuaylas	P,C,M,LG	BID
	AE Huancarama	P	BID
	AE Chiycheros	P,M	BID
	AE Abancay	P,C,M	BID
	AE Curahuasi	C,LG,M	BID
	AE Kosñipata	A	BID

CIPA	Unidad	Programa Nacional	Fuente de Financiamiento
XIV (continuación)			
	AE Pilcopata	A	BID
	AE Yanaoca	P	BID
	AE Yauri	-	BID
	AE Acobamba	P	BID
	AE Huancaray	P	BID
	AE Chalhuanca	C	BID
	AE Cotabambas	C	BID

XV

	EE Illpa	P,C	BID
	SEE Pachani	M	BID
	SEE Tahuaco	P,C,LG	BID
	SEE Salcedo	C	BID
	EP Puno-papa	P	BID
	EP Puno-cereales	C	BID
	EP Ayaviri-papa	P	BID
	EP Ayaviri-cereales	C	BID
	AE Ilave	P,C	BID
	AE Puno	P,C	BID
	AE Yunguyo	C,P,LG	BID
	AE Huancané	P,C	BID
	AE Sandia	P	BID
	AE Azángaro	P,C	BID
	AE Ayaviri	P	BID
	AE Ollachea	P,M	BID
	AE San Juan de Oro	M	BID
	AE Crucero	P	BID
	LRS Puno	-	BID
	Escuela Quesería	-	BID

XVI

	EE San Ramón	A,M,LG	IEE
	EE San Roque	A,M,LG	IEE
	EP Iquitos-arroz	A	IEE
	EP Iquitos-maíz	M	IEE
	EP Yurimaguas-maíz	M	IEE
	EP Yurimaguas-arroz	A	IEE
	AE Iquitos	A,M,LG	IEE

APPENDIX D

TECHNICAL ASSISTANCE

Table 1. Summary of Short term Technical Assistance by individual and time for NCSU Mission to Peru.

Individual	1982	Time Period		1984
		1983	(person months)	
<u>NCSU</u>				
J. L. Apple				*
04/29-05/07	.29			
06/22-06/26	.17			
06/04-06/17		.47		
D. Bateman				
06/04-06/17		.47		
J. Bragg				*
06/27-07/03	.23			
P. Burke				
03/07-05/28		2.97		
G. L. Carter				*
08/01-08/25	.31			
11/17-11/28	.40			
01/02-01/17		.45		
06/01-06/26		.87		
R. Cook				*
09/12-09/25		.47		
A. Coutu				*
02/01-04/28	2.90			
01/05-03/05		1.97		
05/29-06/06		.30		
08/17-08/28		.40		
R. Gregory				*
06/07-07/01		.83		
R. A. King				*
06/14-06/26	.43			
02/13-03/05		.70		
LeRoy Martin				
09/24-10/01		.30		

* Likely prospects for 1984

Individual	1982	Time Period	
		1983	1984
(person months)			
G. Naderman 03/07-03/19		.43	
L. Nelson 02/28-03/11 06/27-07/13	.40	.57	*
P. Sanchez 06/14-06/25	.40		*
M. Schulman 08/07-08/18	.40		
F. Smith 08/03-09/01 06/03-07/03 08/02-08/30	1.00	1.03 .97	*
R. Simmons 11/06-11/30		.83	*
✓ J. Tart 06/07-07/01		.83	
✓ L. G. Wilson 05/01/05/15	.50		*
<u>Other Short Termers**</u>			
J. Barnett (CIMMYT) 07/12-08/11	1.00		
W. Couto (CIAT) 06/12-06/30	.60		*
J. Durbin (CIMMYT) 07/12-08/11	1.00		*
F. Ezeta (CIP) 06/01-09/30	4.00		
J. Galvez (CIAT) 08/08-08/16	.30		

* Likely prospects for 1984

** Allocated equally by research, extension and educational activities.

Individual	1982	Time Period	
		1983	1984
(person months)			
P. Jennings (CIAT) 08/08-08/16	.30		*
C. Pomerada (IICA) 08/19-09/02		.50	
10/12-10/21		.30	
E. Pulver (CIAT) 08/08-08/31	.80		
E. Temple 09/01/09/10	.30		
Totals	16.23	15.66	

* Likely prospects for 1984.
 ** Allocated equally by research, extension and educational activities.

Table 2: Summary of Short Term Technical Assistance activities under NCSU Mission to Peru.

Type of Activity	Contract Estimates	1982	Time Periods		1984*	Total
			1983			
(person months)						
Education	14	5.85	5.97		6.00	17.82
Extension	28	5.20	2.98		6.50	14.68
Research	21	5.18	6.71		5.00	16.89
Total	63	16.23	15.66		17.50	49.39

* Estimated

Table 3: Summary of Long Term technical Assistance activities under NCSU Mission to Peru.

Type of Activity	Contract Estimates	1982	Time Period		1984	Total
			1983			
(person months)						
Chief-of Party	36	5.1	12.0		12.0	29.1
Extension	36	5.6	9.3		12.0	26.9
Education*	24	0.0	0.0		12.0	12.0
Research	24	8.3	12.0		12.0	32.3
Total	120	19.0	33.3		48.0	100.3

* In 1984 this assumes a shift to agro-economic position.

APPENDIX E

THESIS TOPICS:

REE BECARIOS AT UNA

RELACION DE ALUMNOS DE INIPA

<u>Nombre</u>	<u>Especialidad</u>	<u>Proyecto de Tesis</u>	<u>Lugar</u>	<u>Prof. Consejero</u>
1. Benites Luna Oscar	Mejoramiento	"Estudio de Adaptación del Triticale (<u>Triticale rimpai</u>) en condiciones favorables y desfavorables en el Departamento de Arequipa"	Arequipa	Ing. Marino Romero L.
2. De la Cruz Rojas, Jesús	"	" No ha presentado		
3. Huanco Sacachipana, Valeriano	"	"Estudio de tipo de acción génica para resistencia a heladas en clones tetraploides de papa".	Huancayo Puno	Dr. Humberto Mendoza
4. Millones Vidaurre, José	"	"Comparación entre cultivares de Maíz (<u>Zea mays</u> L.) con diferentes grados de adaptación en tres niveles de fertilidad".	Ancash	Dr. Alfonso Cerrate
5. Pacheco del Castillo, Miguel	"	"Evaluación de Clones Resistentes al Nematodo del Quiste de la Papa (<u>Globodera spp</u>) en dos ambientes en la zona de Cuzco"	Cuzco	Dr. Peter Schmiediche
6. Quevedo Willys Sergio	"	"Interacción Genotipo Ambiente en Colecciones y Compuestos Raciales de Maíces de Sierra".		Ing. Ricardo Sevilla
7. Zúñiga López Noemi	"	"Producción y Utilización en Mejoramiento de papas de formas artificiales tetraploides de la especie Diploide <u>S. goniocalyx</u> Juz. et Buk."		Dr. Humberto Mendoza
8. Velasco Urquiza Eyla	"	" No ha presentado		

// ...

RELACION DE ALUMNOS DE INIPA (Cont. ...)

<u>Nombre</u>	<u>Especialidad</u>	<u>Proyecto de Tesis</u>	<u>Prof. Cons.</u>
9. Del Carpio Farfán, Aníbal	Prod. y Extensión	"Análisis de la Tecnología Tradicional del Cultivo de la Papa en el CIPA - XIV CUZCO-Su Importancia en Extensión Agrícola "	Ing. Pedro Valdiviezo
10. Luglio Pinedo, Carlos	" "	"Influencia del Servicio de Extensión en la Adopción de Prácticas en el Cultivo de Papa en el CIPA XIV - Cuzco".	Ing. Pedro Valdiviezo
11. Mejía Esquivez, Mariano	" "	"Estudio del Valle de Chicama para la Formulación de un Programa de Extensión Agrícola"	Trujillo Ing. Américo Valdéz
12. Orbegoso Lora, Luis	" "	" Estudio del Valle Chancay-Lambayeque para la Formulación de un Programa de Extensión Agrícola"	Ing. Américo Valdéz
13. Párraga Reyna Marino	" "	" Análisis y Adaptación del Sistema Capacitación y Visita en el CIPA XII-Huanca ^u yo. "	Ing. Antonio Manrique
14. Hidalgo Camachi Antenor	Fitopatología	" Efecto Sinergístico de Algunos Virus sobre dos Cultivos de Papa"	Ing. César Fribourg

RELACION DE ALUMNOS DE INIPA (Cont. ...)

<u>NOMBRE</u>	<u>ESPEC.</u>	<u>Proyecto de Tesis</u>	<u>Patrocinador</u>
15. Tafur Santillán Segundo	Fitopatología	"Efectividad de la Resistencia de las Variedades de Amapola y Molinera a la Marchitez Bacteriana de la Papa".	Ing. Leonor Matos
16. Velásquez Camacho Tulio	Suelos	" Estudio del Efecto del Azufre y los Fertilizantes Nitrogenados sobre la solubilidad de la Roca Fosfatada de Bayovar"	Dr. Manuel Arca B.
17. Garay Canales, Oscar	Prod. Agríc.	"Rendimiento de Papa con tres tipos de rotación, seis niveles de NPK, en el Valle del Mantaro".	Dr. Félix Quevedo
18. Gilberto Rodríguez Soto	" "	"Potencial de Resistencia a Virus en Especies Silvestres de Papa Sudperuanas".	Ing. Carlos Ochoa

APPENDIX F

RESUMES OF TEAM MEMBERS

Resume of Team Members

Morris D. Whitaker (Team Leader)

Dr. Whitaker is currently Director, Office of International Programs and Studies, and Associate Professor, Department of Economics, Utah State University. He previously served as Senior Advisor to the Administrator and Deputy Acting Director for Food and Agriculture, USAID, 1981-82, and as Agricultural Economist and Deputy Executive Director of BIFAD, 1978-82. He has extensive international and consulting experience including 3 years as Economic Advisor to the Ministry of Agriculture in Bolivia on a Utah State University USAID contract, 2 years in Brazil as a Ford Foundation Research Associate, and numerous short term assignments. Dr. Whitaker received his Ph.D. in Agricultural Economics from Purdue University in 1970 and has published widely and taught in the area of International Agricultural Development. He has conducted agricultural sector assessments in several countries and in 1983 participated in the final evaluation of the University of Florida's Title XII project in Ecuador.

David W. James (Research Specialist)

Dr. James is currently Professor of Soil Science and Biometeorology, Utah State University where he teaches, conducts research and has published extensively in the area of soil chemistry, fertility, and soil fertility - moisture interaction on crop growth. He is a member of the International Irrigation Center at Utah State and has served as technical advisor in the design and interpretation of experiments and demonstrations on irrigated crop production to USU team members in numerous Latin American countries. His international experience includes 3 years in Bolivia as Research Director and Chief of Party for a multidisciplinary agricultural research and extension project with the Consortium for International Development. He has served on short term assignments in Brazil, Bolivia, Bangladesh, Ecuador, India, Guatemala and Honduras. Dr. James received his Ph.D. from Oregon State University in 1962 and served on the faculty at Washington State University before moving to Utah State in 1969.

Dan C. Galvan (Extension Specialist)

Dr. Galvan is currently District Extension Director with the Texas Agricultural Extension Service, Texas A&M University. He previously served as Country Extension Agent, Community Resource Development Specialist, and as a Soil Conservationist with the Soil Conservation Service. His extensive international experience includes 6 years as Regional Agricultural Advisor and National Extension Services Advisor in the Dominican Republic on the Texas A&M USAID contract. He has participated in several short term assignments in Peru and other Latin American countries including the 1979 Baseline Study of the Peruvian Agricultural Research, Education and Extension System. Dr. Galvan has received numerous awards for outstanding service from the Secretariat of Agriculture in the Dominican Republic and from the Organization of American States. He received his B.S. and M.S. degrees in Agricultural Education and his Ph.D. in Educational Psychology from Texas A&M.

George W. Norton (Agricultural Economist)

George W. Norton is currently assistant professor of Agricultural Economics, Virginia Polytechnic Institute and State University. He teaches production economics and international agricultural trade and development and conducts research in the areas of research and extension evaluation, pest management, and agricultural development. He spent 1971-73 with the Peace Corps in Colombia and 1977-78 as a consultant to Winrock International Livestock Research and Training Center assisting the Sisseton Washpeton Sioux Indian Tribe with tribal farm planning. In 1983, he participated in an FAO-USAID review of the Nepal Agricultural Research System. Dr. Norton received his Ph.D. from the University of Minnesota in 1979, and spent 1979-80 as a Research Associate at Minnesota conducting research on methods for evaluating agricultural research, extension, and education.

Jose Valle-Riestra (Research Management Specialist)

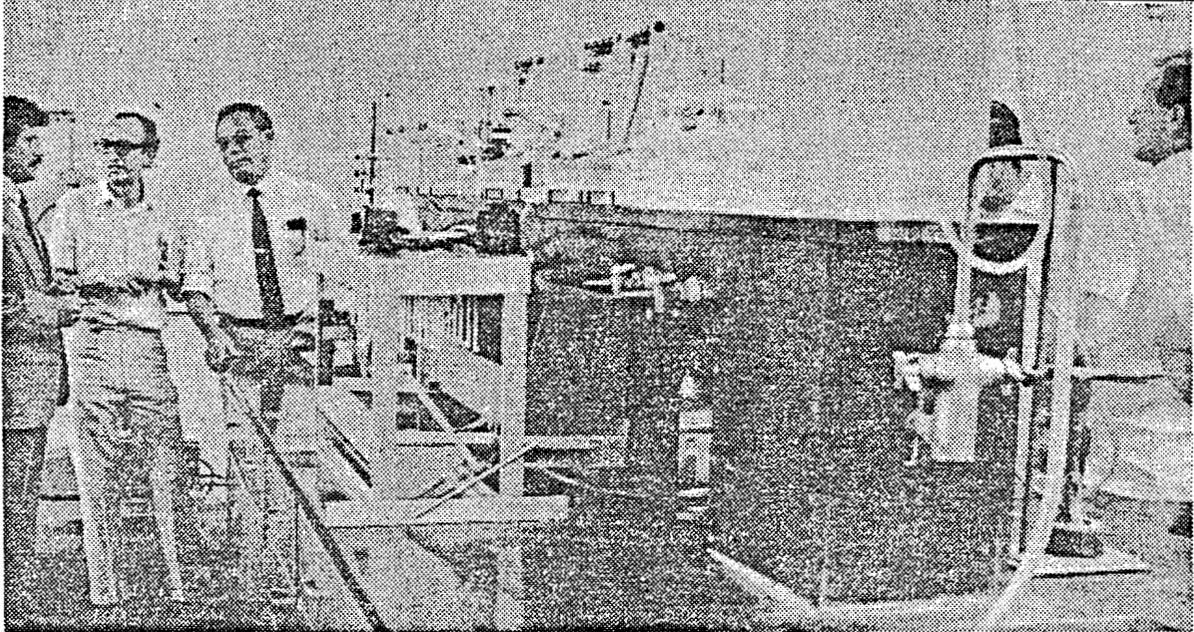
Dr. Valle-Riestra is currently Deputy Director General of the International Potato Center (CIP) in Peru and has extensive experience in administration of agricultural research and education. He previously served as Director of International Cooperation at the International Center for Tropical Agriculture (CIAT) in Colombia where he coordinated outreach activities and shared in the management of the center (1980-82). He worked for 6 years with the International Development Research Center in Colombia as Representative for Latin America and the Caribbean and as Associate Director for Animal Science in the Division of Agriculture where he identified, developed, and monitored research projects. Dr. Valle-Riestra was Professor, Department of Nutrition and Director of Research at the National Agrarian University at La Molina in Lima, Peru for 1962-75 and has worked on a short term basis in numerous Latin American, African, and Asian countries. He has served as Vice-President for the Peruvian Association for the Advancement of Science, member of the Board of Directors of CIP, and board member of the Foundation for National Development, Peru. He received his Ph.D. in nutrition in 1968 from Cornell University.

APPENDIX G

NEWSPAPER ARTICLE:

REGIONAL SERVICE LABORATORIES

El Comercio



El moderno laboratorio de suelos, aguas y plantas, instalado en la Universidad Nacional Agraria de La Molina con fines de capacitación docente. A la izquierda, el doctor Víctor Palma, jefe del Inipa, entidad que entregó el citado laboratorio que junto con once más constituirán la red nacional en este campo de la investigación.

Agricultores tendrán laboratorios para análisis de suelos y plantas

Por primera vez los agricultores de las tres regiones del país contarán con un servicio de laboratorios que les permitirá un mejor aprovechamiento del suelo y un uso racional de los insumos que utilizan en sus cultivos.

Ello será posible merced a un esfuerzo del Instituto Nacional de Investigación y Promoción Agropecuaria (INIPA), que para el efecto ha adquirido doce laboratorios de análisis de suelos, aguas y plantas, once de los cuales se instalarán en igual número de localidades del país, tanto en la costa, como en la sierra y la selva.

Ayer al mediodía, en ceremonia realizada en el salón de grados de la Universidad Nacional Agraria, el Inipa hizo entrega a ese centro superior de estudios de los equipos del laboratorio que servirán para la capacitación del personal de ingenieros y laboratoristas que operarán esta red, denominada "Servicio Nacional de Laboratorios".

En dicho acto, el rector de la universidad, ingeniero Guillermo Parodi, recibió del jefe del Inipa, doctor Víctor Palma, el laboratorio que servirá para los referidos fines de capacitación.

FINANCIADOS POR EL AID

Dichos laboratorios, avaluados en 500 mil dólares, han sido adquiridos con financiamiento de la Agencia Internacional para el Desarrollo (AID), en el marco del Proyecto de Investigación, Extensión y Educación, suscrito entre los gobiernos del Perú y de los Estados Unidos de Norteamérica.

Los laboratorios funcionarán en las localidades de Tarapoto, Huaraz, Chiclayo, Arequipa, Cajamarca, Yurimaguas, Tingo María, Huancayo, Cuzco y Puno, dentro del ámbito de los Centros de Investigación y Promoción Agropecuaria (CIPA) de esos sectores.

El programa nacional de laboratorios del Inipa abarcará en su segunda etapa el equipamiento de laboratorios de entomología, fitopatología, nematología y malezas, con el fin de prestar al agricultor un servicio integral, habiéndose previsto aumentar la red con la colaboración de proyectos especiales y otras fuentes de financiamiento, según informó el doctor Víctor Palma.

APPENDIX H

FEASIBILITY OF AGRICULTURAL RESEARCH SYSTEM REVIEW FOR PERU

(Prepared by George W. Norton in accordance
with Scope of Work)

APPENDIX H

Feasibility of Agricultural Research System Review for Peru

The evaluation team was requested to provide USAID/Peru with information on the feasibility of conducting a two-stage review of the Peruvian agricultural research system. One stage would involve a short (3-4 week) reconnaissance study of the system by a group of 3 or 4 senior agricultural scientists from U.S. universities. They would examine such factors as research capacity (manpower, facilities, objectives, goals, priorities, quantity and quality of research, and utilization of research information), management of the research system (planning, implementation, and reporting), and answer other questions related to the functioning of the research system. The second stage would involve a longer term effort in which one or more junior staff members (research assistants or associates) would be placed in INIPA for a period of 6 months to initiate a series of research productivity and allocation studies. The purpose would be to assess the social benefits of research and to develop the capacity to monitor the impact of research on production and set priorities. A staff member(s) within INIPA and/or perhaps one or more masters students at UNA would also be assigned to work on the project. Additional short term consulting in Peru by U.S. scientists to provide guidance to junior staff members would also be envisioned.

The ability to conduct a useful research system review would depend on (1) the need expressed to such a study, (2) data availability, and (3) availability of Peruvian counterpart staff members to work on the project and people within the Peruvian agricultural research system who would understand how to use the results of the study, and (4) the availability of USAID financial support for a minimum of 2 years.

(1) Need -- With USAID, World Bank, BID and other donor support, Peru has undertaken a revitalization of its agricultural research system since 1980. The results of this effort are beginning to bear fruit, but will require a careful and continual review of research priorities in the future. Due to the current economic crisis within Peru, funds for agricultural research have been scarce, at times delaying the use of donor funds for lack of counterpart monies. The value of agricultural research must be demonstrated to the Ministry of Economy and Finance. The use of resources for agricultural research, extension, and education must be justified in terms of the value of new knowledge to society. The estimation of that value requires formal economic analysis. Information on the historical and potential impact of technological change on productivity growth or income distribution can represent a valuable input into the political bargaining process leading to research resource support.

Information about research capacity, management, and the development of a mechanism for establishing research priorities would guide both Peru and donor agencies in allocation of research funds. The Director of INIPA and the leader of the agricultural economics program have expressed interest in this type of analysis proposed. An initial focus for the longer term component of the study would involve measuring the contribution of agricultural research and extension to growth in agricultural production at the

national and regional levels. At the same time, other analyses could be conducted on the contribution of research to the production of one or more specific commodities such as rice or corn, and on the consequence of agricultural research expenditures with the value of particular commodities to Peru.

(2) Data -- An agricultural research system review for Peru would require data on agricultural production, use of agricultural inputs, human and material inputs devoted to agricultural research and extension, and other factors contributing to changes in agricultural production. Collection of this data would require the cooperation of INIPA, UNA, and the agricultural statistics office in the Ministry of Agriculture. Data are needed for the past 25-30 years. While time did not permit careful examination of all relevant data sources, the agro-economics unit in INIPA, felt that sufficient data do exist for the study.

(3) Use of Results -- The recently appointed Director of INIPA is an exceedingly capable and experienced research agency administrator. He has Ph.D. level training in agricultural economics and is familiar with the use of research evaluation studies and some of their limitations. The recently appointed leader of the agricultural economics program is very capable and plans to provide some assistance to the Director on research and extension resource allocation issues.

The Minister of Agriculture also has an M.S. in agricultural economics and should be capable of using the results of the proposed study effectively.

In summary, an agricultural research review does appear to be feasible. Some difficulty will undoubtedly be experienced in separating the impacts of research, extension, and education since these are complementary inputs. Furthermore, the impacts of the international centers may be difficult to separate as well. These problems should not be insurmountable.

The long term component is especially necessary for the project to achieve maximum effectiveness. The short term reconnaissance study may be relatively less important given the recent mid-term evaluation of the REE project which touched on some of the issues which the short-term review would examine. USAID might want to consider broadening the terms of reference for the next REE evaluation to include some of the questions not yet addressed and thereby eliminate the need for the short term component of the study.

An additional factor that USAID may want to consider is the cost effectiveness of focusing only on Peru. Expanding the study to 3 or 4 neighboring countries would not triple or quadruple the cost and would provide an opportunity for cross country comparisons and sharing of knowledge gained from studying multiple research systems. Other logical countries would be the Andean nations of Colombia, Ecuador, and Bolivia. Some research productivity studies have previously been conducted in Colombia by Scobie and Posada¹ and in Bolivia by Wennergren and Whitaker.²

Note - Footnotes 1 and 2 are on following page.

-
- ¹ Scobie, G.M. and R. Posada, "The Impact of Technical Change on Income Distribution: The Case of Rice in Colombia", American Journal of Agricultural Economics, 60(1978): 85-92.
- ² Wennergren, E. B. and M. D. Whitaker, "Social Return to U.S. Technical Assistance in Bolivian Agriculture: The Case of Sheep and Wheat." American Journal of Agricultural Economics, 59(1977): 565-569.

List of Literature Reviewed

Agency for International Development, 1982. AID Policy Paper: Food and Agricultural Development. AID/W.

Agency for International Development, 1982. Cost Reimbursement Contract with North Carolina State University. Contract No. 527-0192-C-00-2004-00.

Agency for International Development, 1981. Peru. Country Development Strategy Statement FY 83. United States International Development Cooperation Agency, Washington, D.C., 34 p.

Agency for International Development, 1983. Peru. Project Paper. Agricultural Planning and Institutional Development. United States International Development Cooperation Agency. Washington, D.C., 124 p., Annexes I & II.

Apple, Lawrence J. and D. F. Bateman, 1983. Report on Administrative Visit to Peru. 17 p., Appendix I & II.

Baseline Editorial Group, 1979. Baseline Study of the Peruvian Agricultural Research, Education and Extension System. Translated from the Summary Document submitted to the Government of Peru, 87 p.

CIPA X - Moyobamba, 1984. Evaluacion de las Actividades de Investigacion y Extension - 1983. Mimeographed document. Tarapoto, Peru, 22 p.

Coutu, A. J., 1983. A Brief Review of NCSU Involvement in Agricultural Research, Extension and Education in Peru, 1955-1983. Paper prepared for REE Review, 7 p.

Department of State. Agency for International Development, 1980. Peru, Project Paper. Agricultural Research, Extension and Education. Washington D.C., 82 p. (three annexes included).

Instituto Nacional de Investigacion y Promocion Agropecuaria, 1983a, Programa Nacional de Agroeconomia. Documento Base. Lima, Peru, 36 p.

Instituto Nacional de Investigacion y Promocion Agropecuaria, 1983b, Programa Nacional de Arroz. Documento Base. Lima, Peru, 44 p.

Instituto Nacional de Investigacion Y Promocion Agropecuaria, 1983c, Programa Nacional de Cereales. Documento Base. Lima, Peru, 68 p.

Instituto Nacional de Investigacion y Promocion Agropecuaria, 1983d, Programa Nacional de Leguminosas de Grano. Documento Base. Lima, Peru, 26 p.

Instituto Nacional de Investigacion y Promocion Agropecuaria, 1983e, Programa Nacional de Maiz. Documento Base. Lima, Peru, 59 p.

Instituto Nacional de Investigacion y Promocion Agropecuaria, 1983f, Programa Nacional de Papa. Documento Base. Lima, Peru, 59 p.

Instituto Nacional de Investigacion y Promocion Agropecuaria, 1983g, Programa Nacional de Sistemas de Produccion Andina. Documento Base. Lima, Peru, 70 p.

Ministerio de Agricultura Programa Sectorial Agropecuario, 1981. Contrato de Prestamo entre la Republica del Peru y el Banco Interamericano de Desarrollo. Lima, Peru, 79 p.

North Carolina State University Mission to Peru. 1983. REE Contract Quarterly Reports, Nos. 1-8.

Parodi Vera, Guillermo. 1984. Letter (No. 19055/84-SG-UNA) from the Rector of UNA to the Head of INIPA listing the names of the faculty that are eligible to receive REE supplementary salaries.

Pulver, Edward; W. Lopez, and C. Bruzzone. 1983. Estrategia de Investigacion para el Mejoramiento de la Produccion de Arroz en la Selva Peruana. Programa Nacional de Arroz Selva. INIPA.

Sanchez, Pedro A. 1983. The Redevelopment of Peru's Agricultural Research, Extension and Education System: 1982-83. INIPA, Lima, Peru, 40 p.

The World Bank. Staff Appraisal Report, 1982. Peru, Agriculture Research and Extension Project. Regional Projects Department. Latin American and Caribbean Regional Offices, 84 p.

U.S. Presidential Mission to Peru, 1982. Report, Washington, 52 p.