# A.I.D. EVALUATION SUMMARY - PART I

PD-ABJ-940

1. BEFORE FILLING OUT THIS FORM, READ THE ATTACHED INSTRUCTIONS.
2. USE LETTER QUALITY TYPE, NOT "DOT MATRIX" TYPE.

## IDENTIFICATION DATA

A. Reporting A.I.D. Unit:
Mission or AID/W Office: Lima/Peru
(ES# _____)

B. Was Evaluation Scheduled In Current FY Annual Evaluation Plan?
Yes [X] Slipped [ ] Ad Hoc [ ]
Evaluation Plan Submission Date: FY 93 Q ___

C. Evaluation Timing
Interim [ ] Final [X]
Ex Post [ ] Other [ ]

D. Activity or Activities Evaluated (List the following information for project(s) or program(s) evaluated; if not applicable, list title and date of the evaluation report.)

| Project No. | Project /Program Title | First PROAG or Equivalent (FY) | Most Recent PACD (Mo/Yr) | Planned LOP Cost (000) | Amount Obligated to Date (000) |
|---|---|---|---|---|---|
| 527-0282 | Agricultural Technology Transformation - ATT | 87 | 08/93 | 25,000 | 23,197 |

## ACTIONS

E. Action Decisions Approved By Mission or AID/W Office Director

| Action(s) Required | Name of Officer Responsible for Action | Date Action to be Completed |
|---|---|---|
| Close out the project at the PACD | Harry E. Wing | 08/31/93 |
| As recommended, support to successful ATT activities will continue under the Microenterprise Support Project, including:<br>° Seed and Rootstock certification through the CODESES<br>° Technology transfer through private research stations<br>° Human resource development through technical schools - preparation, strengthening and implementation of non-formal training curricula related to agriculture production, post-harvest treatment and processing. | Harry E. Wing | 07/15/94 |

(Attach extra sheet if necessary)

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## APPROVALS

F. Date Of Mission Or AID/W Office Review Of Evaluation: (Month) (Day) (Year)

G. Approvals of Evaluation Summary And Action Decisions:

| | Project/Program Officer | Representative of Borrower/Grantee | Evaluation Officer | Mission or AID/W Office Director |
|---|---|---|---|---|
| Name (Typed) | Harry E. Wing | Rodolfo Masuda M. | William Egan | |
| Signature | H. Wing | [signature] | [signature] | [signature] |
| Date | 05/18/94 | 6/21/94 | 5/25/94 | |

## ABSTRACT

H. Evaluation Abstract (Do not exceed the space provided)

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The Project sought to strengthen Peru's agricultural technology generation and transfer (ATG&T) system through improved public and private sector research capability, enhanced "retailing" of new technologies to farmers through a variety of means and institutions, and postgraduate training for Peruvian agricultural professionals. The project was implemented principally through the GOP National Institute of Agricultural Research (INIA); the National Agrarian University at La Molina (UNALM), the National Agrarian Organization (ONA), the Ministry of Agriculture, and the Agricultural Development Foundation (FUNDEAGRO), the latter established to foster institutional coordination and disburse funds for the Project. North Carolina State University provided the services of a long-term resident TA team. This final evaluation was conducted by a team contracted through the U.S. Department of Agriculture on the basis of an extensive document review, interviews with Peruvian and USAID participants and Project staff, and wide-ranging visits to Project field areas. The purpose was to review the present status of Peru's ATG&T system, to assess lessons learned, and to establish preliminary bases for future USAID programming. Principal findings and conclusions include:

- The Project, while well-conceived technically, was too large and complex for easy management and coordination, given Peruvian institutional instability in the late 1980s. A series of internal and external problems combined to reduce FUNDEAGRO's effectiveness as principal facilitator and dispenser of Project funds.

- INIA has become a leaner, better organized institution which, nevertheless, needs help in prioritizing and streamlining its research agenda.

- Creation of private "Technology Transfer Enterprises" under the Project has been only marginally successful. Future such efforts should concentrate upon strengthening existing farmer service organizations.

- Future USAID support in the ATG&T area should be oriented towards market-driven export priorities exploiting Peru's agricultural comparative advantage.

- The ATT seed program was successful, but the Departmental Seed Committees (CODESEs) need help in developing economic sustainability.

- Despite a late start, the UNALM off-shore and in-country postgraduate degree programs have proceeded well, the former essentially complete, the latter still underway as the University encourages candidates to finish their programs; support for this should continue as funds remain available.

Principal Lessons Learned:

- Large-scale projects aimed at altering relationships among a number of public and private institutions in a volatile political climate should be carefully partitioned and phased over time.

- Project funds should be channelled directly to participating institutions rather than through *ad hoc* organizations such as FUNDEAGRO created for other purposes under the Project.

- Efforts to privatize hitherto public sector research and transfer functions should, wherever possible, focus upon support for already existing private sector agricultural service enterprises more directly attuned to farmers' needs.


## COSTS

I. Evaluation Costs

| 1. Evaluation Team | | Contract Number OR TDY Person Days | Contract Cost OR TDY Cost (U.S. $) | Source of Funds |
|---|---|---|---|---|
| Name | Affiliation | | | |
| Larry M. Boone | OCDI | PASA # 527-0282-P-00-3159-00 | 116,000 | Project |
| Charlotte Miller | OCDI | | | |
| James Murphrey | OCDI | | | |
| John O'Donnell | OCDI | | | |

2. Mission/Office Professional Staff Person-Days (Estimate) 10

3. Borrower/Grantee Professional Staff Person-Days (Estimate) 30

# A.I.D. EVALUATION SUMMARY - PART II

SUMMARY

J. Summary of Evaluation Findings, Conclusions and Recommendations (Try not to exceed the three (3) pages provided)
Address the following items:

- Purpose of evaluation and methodology used
- Purpose of activity(ies) evaluated
- Findings and conclusions (relate to questions)
- Principal recommendations
- Lessons learned

| Mission or Office: | Date This Summary Prepared: | Title And Date Of Full Evaluation Report: The Final Evaluation of the Agricultural Technology Transformation (ATT) Project 1987-1993 June 1993 |
|---|---|---|
| ORD | 11/24/93 | |

1. Purpose of the Project The growth of Peru's agricultural production for domestic consumption and exports has been constrained by lack of focussed, effective, and sustained agricultural technology generation and dissemination. USAID strategy has been to foster long-term institution building in public and private sectors in support of a more efficient agricultural technology generation and transfer (ATG&T) system. The Agricultural Technology Transformation (ATT) project, building upon prior USAID projects, was designed to address those constraints by raising the quality of Peru's existing agricultural research capability and strengthening technology dissemination to farmers, both through a balanced blend of public and private organizations.

The goal of the Project was to "increase agricultural incomes, rural employment, and on-farm capital formation ... while increasing agricultural output for domestic consumption and exports". This would be accomplished via the purpose of "expanding the scope and improving the quality and relevance of agricultural technology being generated ... and of technology transfer services being provided to Peruvian farmers".

The Project contained three components: (1) technology generation, (2) technology transfer, and (3) human resources development.

Key existing Peruvian institutions which participated in the Project included the National Institute for Agricultural Research (INIA), the Agrarian Development Foundation (FDA) of the National Agrarian University at La Molina (UNALM), the National Agrarian Organization (ONA), and the Ministry of Agriculture (MOA). Specifically created at the outset of the Project were the Project Secretariat and the Agricultural Development Foundation (FUNDEAGRO). Additionally, North Carolina State University (NCSU) and Mid-America International Agricultural Consortium (MIAC) staffed a long-term resident TA team for the Project.

2. Purpose and Methodology of the Evaluation This was the final evaluation of the Project. It was undertaken by a team of four experienced specialists with A.I.D. agricultural projects in Latin America contracted through the Office of International Cooperation and Development (OICD) of the U.S. Department of Agriculture. Besides reviewing Project related documents, reports, and other materials collected before arrival in Lima and during their time in-country, the team travelled widely within Peru interviewing Peruvian participants and USAID staff. One team member visited North Carolina State University to interview former TA team members.

3. Findings and Conclusions

a. Project Design and Institutional Issues

While sound logically and conceptually, the Project was too large and complex in an environment of institutional instability to achieve effective coordination during its lifetime and sustainability thereafter. Thus, the administrative/management structure was unable to cope effectively with organizations resistent to cooperation and with such external shocks as the lack of counterpart funding early in the Project. Moreover, there was an inadequate focus upon demand-driven research and technology transfer, important for a project seeking to strengthen private sector institutions and to encourage setting of sustainable priorities.

Much of the Project funding was channelled through FUNDEAGRO, a new agency without seasoned linkages to others in either the public or private sectors. This impeded FUNDEAGRO in its primary role as encouraging and coordinating private sector participation in technology generation and transfer. The Project Advisory Council --designated to resolve inter-institutional issues and to guide prioritization and policy-- did not function at all.

NCSU/MIAC technical assistance for INIA and UNALM was judged to have been well conceived and implemented. Although aiding in formation of the private technology transfer enterprises, however, the team did not give adequate attention to the economic viability of the entities, to their logical relationships with other ATG&T organizations, and to interinstitutional coordination in general.

Lack of an effective Project Advisory Council, and the severe financial constraints imposed by lack of early counterpart funding, imposed heavy monitoring burdens upon FUNDEAGRO, the Ministry of Agriculture, and USAID, resulting in uneven financial project management, lack of focus, and dilution of support for INIA and other participating entities.

b. Technology Generation

INIA emerged from the project a stronger, more soundly organized institution, having developed sound methods for research and extension, having reduced its surplus payroll, and having produced new varieties and technologies. The organization still lacks strong focus, however, and too many projects are undertaken in the face of sparse funding. Privatization of coastal research stations, while initially risky, should prove beneficial in the longer run as they achieve economic viability. INIA does not yet focus strongly enough on farmers' perceived needs or upon economic criteria for specific technologies.

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The research grants programs of FUNDEAGRO and UNALM have, on balance, enjoyed limited success, the former due to excessively broad criteria (leading to diluted and disjointed projects) and slow (if better focussed) funding in the case of the UNALM. Both programs exhibit promise, however.

c. Technology Transfer

Only three of the 55 technology transfer specialists who received training under the Project remain with INIA, together with 30 other extension specialists, a total of 33, of which only 8 are actually working in technology transfer.

INIA and the ATT Project produced a large volume of media extension materials, which (a) concentrated on introduction of new crops to the exclusion of other elements of agricultural production, (b) lacked overall prioritization and focus, and (c) were not linked with field-oriented instruction. Meanwhile, rapid personnel turnover resulted in a shortage of skilled transfer field personnel in the public sector.

The ONA farm records program appears to have been too cumbersome and time consuming for ready adoption by farmers, although the information collected during the Project has been analyzed and disseminated by ONA.

Eight coastal research stations were being "privatized" at the time of the ATT Project evaluation. Aside from the expected complications inherent in privatizing public sector organizations (e.g., shifting from supply to demand - driven priorities), they will continue to need services from INIA. It might have been more effective to have focussed upon existing firms already supplying services to farmers.

The ATT Project improved seed program has been successful, although the 8 CODESEs need to increase their rates of seed certification if they are to achieve economic viability.

d. Human Resources Development

UNALM clearly has succeeded in strengthening its research and extension teaching programs and improving student and faculty incentives, although much of this was achieved with the University's own resources, given its unexpectedly late entry into the ATT Project.

At the time of the evaluation, all of the 21 candidates for advanced training overseas (M.S. and PhD. levels) and one-third of those slated for in-country training (M.S. level) had completed their studies. UNALM launched a successful "partial scholarship" program to help the remaining in-country trainees complete their M.S. programs.

UNALM's National Agricultural Library now has significantly improved electronic materials storage capability and broadened external links with users and other information sources, both achieved with limited support from the ATT Project.

4. Principal Recommendations

a. FUNDEAGRO should be cast in the role of a catalyst and financial intermediary in a program for promotion of expanded agricultural exports; the organization should have a board of directors independent of other institutional representatives, however.

b. A means should be sought to marshal resources of both public and private organizations with interests in agriculture towards agreed-upon priorities for research, technology transfer, education strategies, and information systems in order to ensure that the process becomes increasingly demand-driven, a *sine qua non* for efficient private enterprise.

c. Future USAID/Peru assistance should be channeled through a collaborative ADEX/FUNDEAGRO market-driven program of support for export commodities exploiting Peru's most significant comparative advantage.

d. USAID/Peru should provide a small, high-level team to help INIA establish new research and extension priorities and strategies. This would complement, and could be the catalyst for, efforts to undertake Recommendation "b" above.

e. A more coherent and applications-oriented strategy for technology transfer should be developed using producers' organizations, cooperatives, seed and input dealers, universities, and others with experience and a more immediate stake in the process.

f. The cost of production program should be continued and expanded to incorporate product prices at all levels. Farm record keeping is an intrinsically good idea, however, and is worthy of reconsideration later on.

g. The CODESEs merit continued support and should be helped to achieve financial sustainability. The seed processing plants at Arequipa and Tarapoto may serve as models for others.

h. The off-shore degree program should be considered successfully completed, with no further action.

i. The UNALM partial scholarship program should be continued, as well as support for additional in-country M.S. grants as remaining funds are available.

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j. An information needs assessment should be done for the National Agricultural Library to determine if further assistance is needed.

5. Lessons Learned

The basic strategy of the Project and its underlying logic were sound. The fundamental problems stem from (a) the large scale of the Project, (b) the large number of disparate institutions involved, (c) the volatile institutional and political climate of the time in Peru, and (d) lack of appropriate Mission response to the early dearth of counterpart funding (which justified a major reappraisal of project goals, strategies, and-- above all-- timing). The assumptions underlining the Project -- in particular the institutional assessment -- were too sanguine. This should be obvious, but it occurs so often in A.I.D. project design, it merits underscoring here: complicated projects involving significant institutional change (public or private) should be carefully phased through time, with sufficient open-endedness to allow room for maneuver should redesign become necessary.

Another key lesson: *ad hoc* organizations (such as FUNDEAGRO) rarely work well as project coordinators -- they lack institutional legitimacy in the eyes of the key public and private sector players until (a) they are viewed as addressing the players' perceived needs and (b) they have been around long enough for old-timers to trust them.

Designers of projects seeking to promote the private sector sometimes forget some important facts: (a) private firms seek profits; if they don't get them they don't survive (translation: they are not sustainable); (b) for private enterprise to be efficient, there must be real competition; otherwise the system becomes predatory; and (c) for either public or private enterprise to achieve their ends, they must address the needs of their clients, that is, their product mix must be "demand-driven". Public entities, seeking strategies which they deem desirable yet which are not demand-driven, have an obligation to support private sector enterprises while initially "bucking the tide" until client demand changes in the future.

On balance the strategies supporting the ATT Project are fine: USAID/Peru is on the right track. What's needed now is support to the key actors -- FUNDEAGRO, INIA, and UNALM -- to redefine their roles and to prioritize their ends. It's clear they have a promising human resource base, and, Peruvian politics permitting, there is room for very considerable progress during the remainder of the 1990s.

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## ATTACHMENTS

**K. Attachments** (List attachments submitted with this Evaluation Summary; always attach copy of full evaluation report, even if one was submitted earlier; attach studies, surveys, etc., from "on-going" evaluation, if relevant to the evaluation report.)

Copy of Final Evaluation.

## COMMENTS

**L. Comments By Mission, AID/W Office and Borrower/Grantee On Full Report**

The one-month evaluation has met the demands of the Scope of Work and was performed by a very professional team of individuals with experience in evaluating the same type of projects in Central and South America.

The findings and lessons learned cited are very much in accordance with the conclusions reached by USAID/Peru.

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JUNE 1993

APR 21 1995

# THE FINAL EVALUATION OF THE

# AGRICULTURAL TECHNOLOGY TRANSFORMATION (ATT) PROJECT 1987 - 1993

EVALUATION TEAM

LARRY M. BOONE, PH.D.
CHARLOTTE MILLER, PH.D.
JAMES MURPHREY
JOHN O'DONNELL

PROJECT No, 527-0282

Prepared for
USAID/LIMA
Under PASA 527-0282-p-00-3159-00

INTERAMERICAN PROGRAMS
OFFICE OF INTERNATIONAL COOPERATION
AND DEVELOPMENT
U.S. DEPARTMENT OF AGRICULTURE

LIMA, PERU

BACKGROUND ..... 37
END OF PROJECT STATUS ..... 38
CONCLUSIONS ..... 39
RECOMMENDATIONS ..... 39

AGRICULTURAL TECHNOLOGY TRANSFER AND EXTENSION ..... 41
QUALITY, QUANTITY AND USE OF INFORMATION AND DATA ..... 41
TECHNOLOGY TRANSFER SPECIALISTS AND PRIVATE SECTOR INVOLVEMENT ..... 42
ONA FARM RECORDS AND ANALYSIS PROGRAM ..... 42
SEED PROGRAM ..... 43
FUTURE DIRECTIONS–TRANSFER OF TECHONOLOGY, EXTENSION, SECTOR DEVELOPMENT ..... 44
INTERNATIONAL SOURCES OF INFORMATION/TECHNOLOGY/DATA ..... 44
MINISTRY OF AGRICULTURE ..... 54
INIA ..... 54
UNIVERSIDAD NACIONAL AGRARIA LA MOLINA (UNALM) AND OTHER LOCAL/REGIONAL UNIVERSITIES IN PERU ..... 55
NATIONAL AGRICULTURE LIBRARY AND OTHER UNIVERSITY LIBRARIES ..... 57
PRIVATE FOUNDATIONS ..... 58
ONA ..... 58
PRODUCER COMMITTEES/LEADING PRODUCERS ..... 58
AGRIBUSINESS, BANKERS, INPUTS DISTRIBUTORS, AGRICULTURAL SUPPORT SERVICES, AGRO-INDUSTRY/PROCESSORS, AND MARKETING FIRMS ..... 59
ADEX ..... 59

HUMAN RESOURCES, AGRICULTURAL MARKETING, AND INFORMATION SYSTEMS ..... 60
EVALUATION OF ATT PROJECT ACTIVITIES ..... 60
IMPROVEMENT OF THE TEACHING PROGRAM–UNALM ..... 60
QUALITY AND ADEQUACY OF ACADEMIC STAFF, TEACHERS AND TRAINERS PRODUCED UNDER THE ATT PROJECT ..... 60
UNALM RESEARCH, TRAINING, AND EXTENSION MATERIALS ..... 61
INTER-INSTITUTIONAL PUBLICATIONS AND TECHNICAL INFORMATION EXCHANGE ..... 61
EFFECTIVENESS OF LOCAL AND OFF-SHORE TRAINING ..... 61
FINDINGS AND RECOMMENDATIONS ..... 65
OFF-SHORE FELLOWSHIPS ..... 65
IN-COUNTRY FULL SCHOLARSHIPS ..... 65
PARTIAL SCHOLARSHIPS ..... 65
INSTITUTIONAL STRENGTHENING ..... 66
NON-GOVERNMENTAL POST-SECONDARY TEACHING INSTITUTIONS ..... 66
ISSUES ..... 67

PROJECT SUCCESSES ..... 68

Table of Contents


ABBREVIATIONS AND ACRONYMS ..... 1

EXECUTIVE SUMMARY ..... 8
EVALUATION AND SHORT-TERM RECOMMENDATIONS ..... 8
TECHNOLOGY GENERATION ..... 8
TECHNOLOGY TRANSFER ..... 9
HUMAN RESOURCES, AGRICULTURAL MARKETING AND INFORMATION SYSTEMS ..... 10
INSTITUTIONAL STRENGTHENING AND COOPERATION ..... 12

ACKNOWLEDGEMENTS ..... 13

DESIGN AND INSTITUTIONS ..... 14
PROJECT AND EVALUATION BACKGROUND ..... 14
SCOPE AND STRATEGY OF THE PROJECT ..... 14
SCOPE OF EVALUATION ..... 14
EVALUATION TEAM MEMBERSHIP AND ACTIVITIES ..... 15
COUNTERPARTS AND GOVERNMENT OF PERU SUPPORT ..... 16
PARTICIPATING INSTITUTIONS ..... 16
FUNDEAGRO ..... 17
PROJECT SECRETARIAT ..... 17
INIA ..... 17
UNALM/FDA ..... 18
ONA ..... 18
A.I.D. ..... 18
NCSU/MIAC ..... 18
MINISTRY OF AGRICULTURE ..... 19
INSTITUTIONAL ISSUES ..... 19
PROJECT DESIGN ..... 19
PROJECT IMPLEMENTATION ..... 20
RELATIONSHIP BETWEEN UNALM AND FUNDEAGRO ..... 22
POLITICAL AND INSTITUTIONAL CONTEXT CHANGES ..... 23
ISSUES AND RECOMMENDATIONS ..... 23
POTENTIAL INTERINSTITUTIONAL DEVELOPMENTS FOR STRONGER SUPPORT OF EXPORT AGRICULTURE IN THE FUTURE ..... 26

TECHNOLOGY GENERATION ..... 30
ACTIVITIES 1A and 1B, CONSOLIDATION AND INTEGRATION OF INIPA RESEARCH PROGRAMS AND STRENGTHENING INIPA ADMINISTRATION AND MANAGEMENT ..... 30
BACKGROUND ..... 30
END OF PROJECT STATUS ..... 32
CONCLUSIONS ..... 34
RECOMMENDATIONS ..... 36
EXPANDING RESEARCH OPPORTUNITIES ..... 37

LESSONS LEARNED ..... 70

REFERENCES ..... 72

X

## ABBREVIATIONS AND ACRONYMS

## LISTA DE ABREVIATURAS Y SIGLAS

| | |
|---|---|
| AID | Agency for International Development<br>(Agencia para el Desarrollo Internacional) |
| AID/P | AID/Perú |
| AID/W | AID/Washington |
| ANAPA | Asociación Nacional de Profesionales Agrarios (National Association of Agricultural Professionals) |
| APALAM | Asociación de Profesionales Agrarios de Lambayeque (Association of Professionals in Agriculture in Lambayeque) |
| APID | Agricultural Policy and Institutional Development Project<br>(Proyecto de Política Agraria y Desarrollo Institu cional) |
| ATG&T | Agricultural Technology Generation and Transfer System<br>(Sistema de Generación de Tecnología Agrícola y Transferencia) |
| ATT<br>(TTA) | Agricultural Technology Transformation Project<br>(Proyecto de Transformación de Tecnología Agrícola) |
| BAN | Biblioteca Nacional Agraria, UNALM<br>(National Agrarian Library, UNALM) |
| BAP | Banco Agrario del Perú<br>(Agrarian Bank of Peru) |
| BS | Bachelor's degree of Science<br>(Licenciatura en Ciencias) |
| CARE | Cooperative for American Relief Everywhere<br>(Cooperativa Americana para la Asistencia en todo lugar) |
| CAU | Cooperativa Agraria de Usuarios<br>(Agrarian Cooperative of Users) |
| CD/ISIS | An FAO bibliographic computer program<br>(Programa computarizado bibliográfico de la FAO) |
| CDSS | Country Development Strategy Statement<br>(Declaración de Estrategia de Desarrollo del País) |

| | |
|---|---|
| CDINFOR | Centro de Documentación Forestal<br>(Forestry Documentation Center) |
| CDR | Centro de Desarrollo Rural, MINAG<br>(Rural Development Center, MINAG) |
| CEAC | Centro de Estadística y Análisis Económico, ONA<br>(Statistical and Economic Analysis Center, ONA) |
| CIAT | Centro Internacional de Agricultura Tropical<br>(International Center for Tropical Agriculture) |
| CICAP | Centro para la Investigación y Capacitación de Chiclayo<br>(Research and Training Center of Chiclayo) |
| CIMMYT | Centro Internacional de Mejoramiento de Maíz y Trigo<br>(International Wheat and Corn Improvement Center) |
| CIP | Centro Internacional de la Papa<br>(International Potato Center) |
| CIPA | Centro de Investigación y Promoción Agraria, INIPA<br>(Center for Agricultural Research and Extension, INIPA) |
| CNA | Confederación Nacional Agraria<br>(National Agrarian Confederation) |
| CNPA | Comité Nacional de Productores de Arroz<br>(National Committee of Rice Producers) |
| CODESE | Comité Departamental de Semillas<br>(Departmental Seed Committee) |
| CONCYTEC | Consejo Nacional de Ciencia y Tecnología<br>(National Council for Science and Technology) |
| CONFIEP | Confederación Nacional de Instituciones Empresariales Privadas<br>(National Confederation of Private Enterprise Institutions) |
| COTESU | Cooperación Técnica Suiza<br>(Swiss Technical Cooperation) |
| CRSP | Collaborative Research Support Program<br>(Programa Colaborativo de Apoyo a la Investigación) |
| CS | Coordinador de Semillas, INIA<br>(Seed Coordinator, INIA) |

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|---|---|
| CTTA | Communications for Technology Transfer in Agriculture Project<br>(Proyecto de Comunicaciones para la Transferencia de Tecnología Agrícola) |
| DEP | Departamento de Economía y Planificación, UNA<br>(Economics and Planning Department, UNA) |
| DG | Director General<br>(General Director) |
| ECASA | Empresa Comercializadora de Alimentos, S. A.<br>(Food Trading Enterprise) |
| EDAP | Equipo de Desarrollo Agropecuario de Cajamarca<br>(Agricultural Development Team of Cajamarca) |
| EEA | Estación Experimental Agraria, INIA<br>(Agricultural Experimental Station, INIA) |
| ENCI | Empresa Nacional de Comercialización de Insumos (Monopolio estatal de comercialización, importaciones de alimentos y distribución)<br>(National Input Marketing Company) |
| ESF | Economic Support Fund, AID<br>Fondo de Apoyo Económico AID |
| ETTASA | Empresa de Transferencia de la Tecnología, S.A.<br>(Technology Transfer Enterprise, S.A.) |
| FONAGRO | Fondo para el Desarrollo Agropecuario<br>(Agricultural and Livestock Development Fund) |
| FUNDEAGRO | Fundación para el Desarrollo del Agro<br>(Agriculture Development Foundation) |
| FUNDEAL | Fundación para el Desarrollo del Cultivo Algodonero<br>(Foundation for the Development of Cotton Cultivation) |
| FUNDETRIGO | Fundación para el Desarrollo del Trigo<br>(Foundation for Wheat Development) |
| FUNSIPA | Fundación de Servicios a la Investigación y Promoción Agropecuaria<br>(Foundation for Services to Agricultural Research and Promotion) |
| FDA/UNALM | Fundación para el Desarrollo Agrario/UNALM<br>(Agrarian Development Foundation of UNALM) |
| GDP | Gross Domestic Product<br>(Producto Bruto Interno) |

| | |
|---|---|
| GNP | Gross National Product<br>(Producto Bruto Nacional) |
| GOP | Government of Peru<br>(Gobierno del Perú) |
| IARC | International Agricultural Research Center<br>(Centros Internacionales de Investigación Agropecuaria) |
| IBRD | International Bank for Reconstruction and Development<br>(Banco Internacional para la Reconstrucción y Desarrollo) |
| ICE | Instituto de Comercio Exterior<br>(Foreign Trade Institute) |
| IDB | Inter-American Development Bank<br>(Banco Inter-Americano de Desarrollo) |
| IDRC | International Development Research Center, Canada<br>(Centro Internacional de Investigación en Desarrollo , Canadá) |
| INAF | Instituto Nacional de Ampliación de la Frontera Agrícola<br>(National Institute for Agriculture Frontier Expansion) |
| INDDA | Instituto Nacional de Desarrollo Agro-industrial<br>(National Institute for Agro-industrial Development) |
| INIA | Instituto Nacional de Investigación Agraria<br>(National Institute for Agricultural Research) |
| INIPA | Instituto Nacional de Investigación y Promoción Agropecuaria<br>(National Institute for Agricultural Promotion and Research |
| INP | Instituto Nacional de Planificación<br>(National Planning Institute) |
| IPAE | Instituto Peruano de Administración de Empresas<br>(Peruvian Institute of Business Administration) |
| IPM | Integrated Pest Management<br>(Manejo Integrado de Pestes) |
| IRRI | International Rice Research Institute<br>(Instituto Internacional de Investigación del Arroz) |
| ISNAR | International Service for National Agricultural Research<br>(Servicio Internacional para la Investigación Nacional de Agricultura) |

| | |
|---|---|
| IVITA | Instituto Veterinario de Investigaciones Tropicales y de Altura, UNMSM<br>(Veterinary Institute for Tropical and Highland, UNMSM) |
| LOP | Life of Project<br>(Vida del Proyecto) |
| MEF | Ministerio de Economía y Finanzas<br>(Ministry of Economy and Finances) |
| MIAC | Mid-America International Agricultural Consortium<br>(Consorcio Mid-Americano Internacional de Agricultura) |
| MINAG | Ministerio de Agricultura<br>(Ministry of Agriculture) |
| MS | Master's degree of Science<br>(Magister en Ciencias) |
| NARCs | National Agricultural Research Centers<br>(Centros Nacionales de Investigación Agropecuaria) |
| NCBA | National Cooperative Business Association<br>(Asociación Nacional de Negocios Cooperativos) |
| NCSU | North Carolina State University<br>(Universidad Estatal de Carolina del Norte) |
| NGO | Non-governmental Organization<br>(Organización No-gubernamental) |
| NRP | National (commodity) Research Programs<br>(Programas Nacionales de Investigación de Productos) |
| NRSP | National Research Support Programs<br>(Programas Nacionales de Apoyo a la Investigación) |
| OARD | Office of Agriculture and Rural Development, AID<br>(Oficina de Agricultura y Desarrollo Rural, AID) |
| OAS | Organization of American States<br>(Organización de Estados Americanos) |
| ONA | Organización Nacional Agraria<br>(National Agrarian Organization) |
| PhD | Doctor of Philosophy degree<br>(Doctor en Filosofía) |

| | |
|---|---|
| PL480 | Public Law 480, USA<br>(Ley 480 de EE. UU.) |
| PM | Person Month<br>(Persona al mes) |
| PNUMA | Proyecto de las Naciones Unidas para el Medio Ambiente)<br>(United Nations Environmental Project, UNEP) |
| PRATEC | Proyecto Andino de Tecnología Campesina<br>(Andean Project of Peasantry Technology) |
| PRISMA | Proyecto de Informática, Salud, Medicina y Agricultura<br>(Information Management, Health, Medicine and Agriculture Project) |
| PVO | Private Voluntary Organization<br>(Organización Voluntaria Privada) |
| PY | Person Year<br>(Persona al año) |
| RD&E | Research, Development and Extension<br>(Investigación, Desarrollo y Extensión) |
| REE | Research, Education and Extension Project<br>(Proyecto de Investigación, Educación y Extensión) |
| SEINPA | Servicios de Investigación en Papa, COTESU<br>(Potato Research Services, COTESU) |
| SNIDA | Sistema Nacional de Información Documental Agraria<br>(National System of Agrarian Documental Information) |
| TA | Technical Advisor<br>(Asesor Técnico) |
| TT | Technology Transfer<br>(Tranferencia de Tecnología) |
| UNALM | Universidad Nacional Agraria - La Molina<br>(National Agrarian University - La Molina) |
| UNC | Universidad Nacional de Cajamarca<br>(National University of Cajamarca) |
| UNMSM | Universidad Nacional Mayor de San Marcos<br>(National University Mayor de San Marcos) |

| | |
|---|---|
| UNPRG | Universidad Nacional Pedro Ruiz Gallo<br>(National University Pedro Ruiz Gallo) |
| US | United States<br>(Estados Unidos de Norteamérica) |
| USG | US Government<br>(Gobierno de los EE. UU) |

## EXECUTIVE SUMMARY

### I. EVALUATION AND SHORT-TERM RECOMMENDATIONS

The Agricultural Technology Transformation (ATT) project was completing the Project Paper stage and entering the implementation stage during a period of rapid change in 1987-88. Expected A.I.D. funding declined from $60 million to $25 million, debt repayment difficulties resulted in the withdrawal of World Bank and InterAmerican Development Bank support, extensive reorganizations of public sector institutions impacted agencies charged with implementing project activities, and politically based security problems were increasing. In spite of these difficulties, the project achieved worthwhile accomplishments.

The ATT project was a broad-based, fairly ambitious project. There is no question that the vision and mission of the project were good, and needed in Peru. In the face of all the difficulties facing the project as implementation began, one would have expected some scaling back of project activities and objectives. In fact the Government of Peru requested adjustments early in the project, but they were not granted. The scope and complexity of the project design combined with this inflexibility created almost impossible project management circumstances at a time when USAID/Peru was suffering increasing difficulties in obtaining project management manpower. Finally, the project design did not allow ready adaptation to institutional reorganizations and other changes as the project progressed. Under ideal conditions, it would have been surprising if all the projected outputs were accomplished, and given the conditions under which the implementation took place, such accomplishment would have been miraculous. The evaluation team concentrated more on identifying programs, activities and systems which either show promise or lack thereof, than on a detailed analysis of the Log Frame outputs.

The ATT project included three major components, each with three activities, or activity categories. The Components, including Technology Generation, Technology Transfer, and Development of Human Resources and Communications, were evaluated as units regardless of the institutional responsibility assignments for the various activities under each. Institutional Development and Inter-Institutional Cooperation objectives were evaluated as a multidisciplinary, multi-activity exercise.

#### A. TECHNOLOGY GENERATION

Despite the problems mentioned, INIA and its predecessor agencies have done a fairly good job. An important achievement has been the development and internalization of a methodology for research and extension. In spite of a tendency to try to spread available resources over too many programs, INIA does try to involve farmers in identifying research and extension needs, and new planning/programming procedures introduced by ATT during the last two years of the project should also help to gain better focus. INIA will inevitably have to continue some kinds of support for coastal research stations which have been turned over to private sector organizations, but will benefit from the drastic reduction in staff recently accomplished, and from the ability to control staff quality under contract laws treating INIA as a private sector institution. The new integrated research and technology transfer strategy developed by INIA, based on the CTTA model, shows great promise for the delivery of new technology by INIA to the Technology Transfer system.

The research grants program administered by FUNDEAGRO was successful in supporting research opportunities for research outside INIA, but suffered from such diversity in subject matter that the impact could not be focussed in a few priority research lines. The university research grants program

administered by UNA was more focussed, but suffered from disbursement problems which interrupted and/or slowed research implementation. Both programs appear to have addressed important problems, but did not allow time for validation of results, and have not yet shown much diffusion of findings.

Primary Recommendations

1. USAID/Peru and the GOP should work together to provide "bridge funding" between the end of the ATT project and the IDB project under preparation. Loss of key people contracted under the ATT project, and the interruption of on-going research, would reduce momentum developed over years of effort, and place important systems in INIA in jeapordy.

2. USAID/Peru should provide a small, high-level team to help INIA establish new, long-term research and extension strategies and priorities. The current priorities are outdated. Current realities and needs broader than agronomic should be included, as well as a market-driven, comparative- advantage-based outlook on Peru's agricultural future. Farmer/agro-industry/private sector/university participation should also be included in the exercise, and the new National Directive Council should make this kind of collaboration a continuing high priority on its agenda.

3. USAID/Peru should support either Fundación PeFUNDEAGRO in assisting, probably with PL-480 financing, the private foundations/associations taking over research stations in the coastal zone. These organizations desperately need help in organizing themselves to be self-sufficient and to develop business plans, set research priorities, etc.

4. USAID/Peru should assist INIA with a short-term assistance team, to improve its personnel management systems.

5. Future USAID/Peru assistance in the agricultural research, extension and education area should be channeled through a collaborative ADEX/FUNDEAGRO market-driven program of support in the production-marketing systems of export commodities of highest comparative advantage. Their role would be to bring together the various players needed for the production, post-harvest handling, processing, marketing, etc. of priority export commodities, in an integrated program which should be based on a strong market orientation.

6. The research grants program success should be presented to IDB by FUNDEAGRO and UNA for possible continuation, with special care to focus the research in critical areas, and to keep it demand driven with careful priority identification.

## B. TECHNOLOGY TRANSFER

The TTA project has supported the generation of a tremendous volume of material, much of it potentially useful to producers. A great variety of means have been used to disseminate material including field days and demonstrations, leaflets, bulletins, magazines, newspapers, radio, television, courses and seminars. In general, the quality of the information appears to be good. Unfortunately, natural transfer agents such as input dealers, banks, cooperatives, producers associations and organizations, local universities and agro-industries were not used, and the problem solving applications of the information suffered as a consequence. The usefulness of much of the information also suffered from the technology focus on agronomic themes, especially variety generation. Farmers contacted

indicated additional information needs relating to harvest/post-harvest technologies, use of fertilizers and pesticides, credit management, water and soil management, marketing, etc. Priority selection of technology receivers and subject matter, including those in the Rural Women's Program, reflect the lack of focus across research, technology transfer and education lines, on a few highly important development enterprises.

Of 55 Technology Transfer Specialists trained, only three remain. The others were lost in the personnel reduction program in INIA. The farm records program of ONA has not worked well, but their cost of production program produces information that is very useful, and needs more diffusion. Price information at various market levels could conceivably be added at minimal expense, and would be very useful also. The seed program, working through eight Departmental Seed Committees (CODESE's), is off to a good start and providing valuable certification. They need to develop more focussed business plans to assure their economic survival, and need to be aware of changing priorities such as the possible movement of much of the rice production to the selva region. Most need further support while they expand their bases for survival as independent economic operations.

The plan to create a series of Technology Transfer Enterprises was another example of a tendency to create artificial entities to perform functions more naturally performed by existing kinds of firms. It is significant that the two which are functioning fairly well also perform services for producers, and technology transfer is a "related event." FUNDEAGRO lacked the time to identify ways for these enterprises to establish their own form of economic sustainability, which in any event would have placed most of them in competition with farm service firms in their communities. The most natural firms for this function are existing farm supply and service firms, associations, cooperatives and producer committees and other producer groups.

Primary Recommendations

1. Develop/adapt a strategy for technology transfer using entities more naturally in position to handle it, such as producers organizations, cooperatives, seed and input dealers, universities, etc. Some of the entities created and/or charged with transfer of technology had little natural access to it, and little natural contact with producers for transferring it.

2. The farm records program may be an idea whose time has not yet come, but the cost of production program should be continued, and if possible expanded to include prices at the farm, village/wholesale, and retail levels. Farmers are not yet accustomed to paying for information, which was a factor in their failing to accept the farm records program, as it is a factor in the need to find more natural ways to transfer technology.

3. Continue to support and assist the CODESE's while helping them develop sustainability, monitoring them for progress. Monitor the seed processing plants in Arequipa and Tarapoto as possible models for others.

## C. HUMAN RESOURCES, AGRICULTURAL MARKETING AND INFORMATION SYSTEMS

This component included improvement of the teaching program at The National Agrarian

University at La Molina (UNALM), improvement of faculty and trainers at UNALM, improvement of the National Agricultural Library at UNALM, modes of technical information exchange used by all participating institutions, and both off-shore and in-country training programs.

UNALM participation in the off-shore training program was reduced by its late entry into active participation in the ATT project, which in turn reduced its opportunities to improve faculty through outside training. The university has made strong efforts to improve the graduation rates of its Masters students, and has programmed expanded practical and field oriented content into its curriculum which will improve the educational preparation when those improvements are implemented.

Participants from other universities in the off-shore training program who have returned are using what they learned to help rethink and restructure their organizations. They were mostly from the National University at Piura and the National University of the Altiplano at Puno.

The National Agricultural Library at UNALM has improved its capabilities during the project, especially with the addition of CD-ROM capability and the beginning of telecommunications capability to link with information sources both inside and outside Peru, and with users. Unfortunately, the ATT project can take only limited credit for advances made.

Modes of technical information transfer vary widely, as pointed out in the technology transfer section. Excellent information has been prepared with ATT funding using the CTTA model of preparing simple, practical materials, especially in Puno, although examples of such information preparation were also received from several other locations. Such information is used for field days, handed out on visits to producers, and used as a basis for radio programs. Time limits prevented a good determination of the exact audiences for this information, and of its impact.

The full scholarship, off-shore training program selected and sent fewer participants than expected, but the savings were used to finance a partial scholarship program within Peru to assist M.S. level graduate students who had finished most of their work except for thesis preparation, in the completion of their degrees. In less than a year of that program, and at a low cost per student, UNALM graduated more Masters students than in the past ten years combined. Areas of study, although not following the project design exactly, still tended to show a bias toward agronomic subjects, both in-country and off-shore. Those returning from training have tended to return to where they originated, with some tendency for the higher level trained individuals to migrate to Lima.

Principal Recommendations

1. The off-shore Ph.D. and M.S. degree grant program should be considered completed, and no further action taken.

2. If funds are available, further grants are recommended for in-country M.S. programs, especially at Piura and Puno.

3. Continuation of the partial scholarship program at UNALM is recommended to assist more students lacking only thesis work to finish their degrees, and the program should be extended to regional universities with M.S. programs to help students in the same circumstances graduate.

4. A needs assessment should be performed to determine whether further investment in the National Agricultural Library should be made to assist it in getting "on line" with information search and access capabilities.

## D. INSTITUTIONAL STRENGTHENING AND COOPERATION

Through the mere necessity of contact through the ATT project, the participating institutions have expanded their contacts and found some ways to cooperate, much of it on a personal basis. The formal cooperation foreseen through the leadership of FUNDEAGRO was largely prevented by giving them the responsibility for administration of the ATT funds for most of the participating institutions, which exacerbated the existing inter-institutional rivalries and mistrust. Cooperation at the field level is visible to short-term visitors such as the evaluation team, and years of working together on the Project Coordinating Committee has developed more tolerance and respect among officials at the national level. Complete agreement is not the goal, but a beginning has been made toward defining complementary roles and agreeing on directions and priorities. Much remains to be done, but if the Fujimori government can maintain relative stability, progress should continue.

Evaluators of the three specific components of the project, while naturally concentrating on the problems of the participating institutions, have all noted strengths which can provide a basis for continuing growth in the sector. Many of the specific recommendations in each of the component evaluations deal with correcting a weakness or continuing to build on strengths. In addition, this paper treats some ways of continuing to strengthen the participation of various insitutions in the development of the agricultural sector and of Peru.

Specific Recommendations

1. Care should be taken in future AID funding arrangements to avoid causing interinstitutional friction which jeapordizes achievement of project objectives. For example, in retrospect, it would have been better for the project funds for INIA and UNA to be disbursed directly by AID. As AID looks to the future, there may be a role for FUNDEAGRO as a catalyst and financial intermediary in an expanded agricultural exports promotiom program. Under such a scheme, participating organizations would work together to establish priorities and decide upon joint program activities with each organization providing funding in accordance with its capabilities. FUNDEAGRO would then become a supplementary funder, filling in with a modest amount of funds as a facilitator and catalyst to get joint programs moving.

2. A Foundation such as FUNDEAGRO should have a Board of Directors composed of individuals selected for their personal knowledge and experience instead of as institutional representatives. Institutional representatives tend to see the new organization as a competitor and to transplant both thinking and points of view from their own agencies. Members selected for their skills and knowledge tend to see it as a new opportunity to accomplish some things other organizations cannot do, and they bring fresh thinking and ideas to their tasks. An advisory council made up of institutional representatives might not be a bad idea, but should act strictly as an advisory body, whose advice may be heeded or not at the discretion of the Board.

3. Recognizing the difficulties involved, the public and private institutions with interests in the agricultural sector must agree at least generally on a few priority directions for concentrated research, technology transfer, and education efforts; expand their view to include more complete systems of information needs; and define roles for each of the various players. Regardless of funding system or good will, cooperation among institutions of both the public and private sectors will occur only when they are all working toward similar goals, and meaningful information will be generated which produces development only when all the information needs of the complete system from producer decision to consumer purchase and use are considered. That, in turn, requires limiting the commodity focus severely at any one time.

## ACKNOWLEDGEMENTS

The evaluation team acknowledges the full and enthusiastic support of all institutions involved in the Agricultural Technology Transformation (ATT) Project during the course of our information gathering and analysis period. Members of the Coordinating Committee shared information, arranged meetings with others in their organizations, provided transportation, arranged visits to outlying areas and accompanied team members on trips, answered endless questions and helped identify others to answer additional questions, and generally exhibited their intense interest in supporting a comprehensive and meaningful evaluation. Collectively and individually, the evaluation team members express their heartfelt thanks for both the assistance we received, and the attitude with which it was given.

Many employees and managers of the involved institutions were visited and interviewed, as well as producers and members of organizations not directly involved in the project. We also appreciate their time and assistance. In spite of the risk of failing to mention important individuals, we have attempted to list those who have helped us in Appendix 1. The team thanks each person interviewed for their assistance in giving us, during a very short time in Peru, an understanding of the functioning of the Agricultural Technology Generation and Transfer (ATG&T) system in the country. We cannot emphasize enough how much we appreciate the interested and enthusiastic assistance given us by everyone from small farm producers to agency heads, Ministers and Vice-Ministers.

In addition, the evaluation team expresses special thanks to Ing. Rafael Espinoza Mosqueira, Ministry of Agriculture Project Manager, and Ing. César Morgan Alcalde, Vice-Minister of Regional Development in the Ministry of the Presidency, for their assistance in arranging office space and computer support in the Ministry of the Presidency where the evaluation team could work when they needed an office. Ing. Espinoza also helped us obtain the services of María Caballero, Administrative Assistant, in that office. The team also expresses its gratitude to Ms. Caballero for her assistance in the preparation of report drafts, interview notes, and other assistance in the completion of the evaluation. Her patience, efficiency and computer skills saved endless time for the team.

## DESIGN AND INSTITUTIONS

## I. PROJECT AND EVALUATION BACKGROUND

### A. SCOPE AND STRATEGY OF THE PROJECT

A multi-faceted strategy of blending public and private interests in the identification of research priorities, designing and performing research, transferring results to producers, training and educating more technical specialists, and strengthening the private and public institutions involved resulted in a project of broad and varied project scope. In the historical context, the fact that this project played a significant role in continuing a development strategy developed in collaboration with the Peruvian Government over two decades and supported not only by A.I.D., but by the World Bank and IDB, must be considered in evaluating both its design and its achievements. While some limits to the technological scope were attempted through identification of priority markets, products and technology requirements, the project addressed a range of institutional and functional issues which could not be limited without seriously impacting the achievement of project goals. Even the attempts to limit the range of markets, products and research programs suffered from difficulties beyond the ability of the project to control. The tremendous range of agricultural zones across Peru, each of which has specific priorities and technological needs and none of which were specifically excluded from Project attention, also contributed to the scope and complexity.

The specific project interventions to accomplish the strategy were selected to both take advantage of, and to attempt to combine, perceived strengths in various public and private institutions. The research mission of the (now) National Agricultural Research Institute (INIA) was to be consolidated (prioritized) and strengthened to assure the development of needed technologies and their flow to producers. The National Agrarian University at La Molina (UNALM) and various regional universities were to be strengthened academically to improve the availability of suitably qualified professional graduates to fill positions in both public and private institutions in the sector. Research and extension capabilities of the universities, particularly La Molina, were also seen as important links in the technology transfer system, but needing prioritization and coordination with programs of INIA. Membership ties of the National Agrarian Organization (ONA) to producer groups at the regional and local levels were seen as an important opportunity to involve both producers and private sector institutions in the definition of research priorities, and potential connections for the transfer of technology to large groups of producers with similar interests and problems. Finally, the Foundation for Agricultural Development (FUNDEAGRO) was formed to strengthen private sector involvement, coordinate and fund activities of both public and private participating institutions, and to guide the identification of priority agricultural enterprises and needed research.

### B. SCOPE OF EVALUATION

The evaluation charge was to assess the effectiveness of the project in achieving the objectives of several interrelated aspects of project operations:

- prioritization of technology generation;
- a smooth transfer of new technologies to the producers needing it;

- interinstitutional cooperation in research prioritization, generation and transfer, including producer and private organization involvement;

- strengthened institutional capabilities in each participating institution to continue to carry out targeted functions, including general and financial management, planning, communication, program coordination with other institutions, etc.;

- development of improved programs for the education and training of appropriate human resources to continue the prioritization and coordination of technology generation and transfer in Peru.

In addition, the evaluation includes the usual retrospective assessments of the appropriateness of project design and implementation, and an analysis of "lessons learned" in the ATT project that support identification of priority future activities and program planning by the Agency for International Development in Peru.

## C. EVALUATION TEAM MEMBERSHIP AND ACTIVITIES

This evaluation was undertaken by the Interamerican Programs Section, Office of International Cooperation and Development, United States Department of Agriculture under PASA Number 527-0282-p-00-3159-00. The Scope of Work and brief biographical materials regarding the team members are included with this report as Annex 2. Team members for the evaluation, and their respective areas of emphasis were:

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| Project Design/Management/ Interinstitutional Cooperation/ Team Leader | Dr. Larry M. Boone |
| Research Prioritization/ Research Institution Strengthening/ Technology Generation | Mr. John O'Donnell |
| Public/Private Technology Transfer/ Seed Program/Data & Analysis of Technology Transfer Needs | Mr. James Murphrey |
| Teaching Programs/Training Programs/ Library Development/Technical Information Communications | Dr. Charlotte Miller |

The evaluation took place over several weeks between May 9 and June 15, 1993. Team member time in Peru varied, and each team member was given flexibility to travel as needed in Peru to achieve the required observation and analysis. Each member met with, or at least contacted, the Project Coordinating Committee early in his or her visit, and proceeded with the full cooperation of those individuals to visit institutions, research stations, technology enterprises, seed committees, universities, firms and individuals as needed. Logistics prevented visits by all team members as a group to most collaborating institutions, and that method was not considered advisable in any event. As mentioned

earlier, lists of contacts of team members appears as an annex to this report.

The North Carolina State University (NCSU) and Midamerica International Agricultural Consortium (MIAC) contract technical assistance team members had all departed Peru prior to the evaluation. However, prior to travelling to Peru, Dr. Miller visited North Carolina State University to discuss the operation of the technical assistance contract team of NCSU/MIAC, and shared her observations with the other team members. Charlotte Miller and John O'Donnell interviewed Fred Mann, former Deputy Chief of Party, by telephone at his new base in Guatemala. John O'Donnell and Larry Boone also had an opportunity in Lima to interview Dr. Dale Bandy, former Team Leader of the NCSU/MIAC team in Peru.

Dr. Gary Smith of USDA/OICD, originally scheduled to be the Team Leader before illness caused his replacement by Dr. Boone, had collected many documents pertaining to the design, implementation, prior evaluation, NCSU/MIAC contract team observations and other aspects of the operation of the ATT Project. Many of these were carried to Peru and supplemented by many more documents provided by the participating institutions. These documents were continually referred to during the period of in-country evaluation. The combined list of major documents consulted appears at the end of the evaluation report.

The final four or five days in Peru afforded a rare opportunity for the team members to work together as a group. Those days were spent in final interviews, discussing the interactions among the respective responsibilities of the members, preparing the first draft of this report, and preparing and presenting briefings to USAID/Peru and the participating institutions of our observations, analyses, conclusions and recommendations. Dr. Boone spent a few extra days in Peru, and some additional days in Washington to assemble this report. Dr. Miller and Mr. O'Donnell were also available for brief periods in Washington to confer and advise during that process. While the team appreciates the enthusiastic assistance of all involved in the project, as well as many more in Washington, contents of the final report remain the responsibility of the team members.

### D. COUNTERPARTS AND GOVERNMENT OF PERU SUPPORT

The original plan for the evaluation included locally contracted counterparts as part of the evaluation team. Contracting difficulties delayed the employment of counterparts, and rather than delay the evaluation, the decision was made to proceed without those individuals.

Members of the Project Coordinating Committee effectively acted as counterparts in the logistics role of arranging meetings, accompanying team members on trips to the field, providing transportation, and generally facilitating our work. The Minister of Agriculture expressed his interest in the project, and support for the evaluation, in separate meetings with Mr. Murphrey and Dr. Boone. Team members exercised complete autonomy in deciding where we wanted to go and what we wanted to see, subject to advice regarding security. Support of the Government of Peru, and of all the involved institutions of the private sector, was absolute in terms of making it possible for the team members to observe what they requested and to interview anyone they wished.

## II. PARTICIPATING INSTITUTIONS

## A. FUNDEAGRO

FUNDEAGRO (Fundación para el Desarrollo del Agro--Agricultural Development Foundation) was created as a non-profit, private institution in 1988, and was intended to be a guiding force in the execution of the TTA project. Support included both public and private organizations, and the Foundation was to play a strong role in developing greater participation of the private sector in the development of the agricultural sector. The original Board of Directors included representation from three private sector institutions, including the National Agrarian Organization (ONA), the Exporters Association (ADEX), and the Engineering College of Peru (Col. Ing.); three public sector organizations including the Ministry of Agriculture (MINAG), the National Agricultural Research Institute (INIA) and the National Agrarian University at La Molina (UNALM); and one international organization, the International Potato Center (CIP). In 1992, the statutes were modified in an effort to increase private sector representation, and representatives of four additional private sector organizations were added. These include the Peruvian Institute for Enterprise Management (IPAE), the National Forestry Chamber (CNF), the National Industrial Society (SNI) and the Association of Banks (Asoc. Banca).

The Foundation operates as a NGO, and is certified as a PVO. It was selected to administer the majority of the donated funds A.I.D. provided for the TTA Project. The models offered by Fundación Chile, FUSADES in El Salvador, and FUNDAGRO in Ecuador were certainly in mind when FUNDEAGRO was created, but despite the mixed membership on the board, the outlook has been more public sector oriented than private sector. The entrepreneurial spirit necessary to put the organization on a solid economic footing has not yet appeared, although FUNDEAGRO has marketed some consulting services to outside entities, including the InterAmerican Development Bank, the Spanish Development Authority and IDRC-Canada, as well as the regional government of Ucayali in Peru.

## B. PROJECT SECRETARIAT

Housed with FUNDEAGRO and headed by a Chief designated by the Ministry of AGriculture, the Project Secretariat coordinated budget and work plan preparation for all the involved institutions, monitored work progress, reported on project activities and progress and supported the Coordinating Committee administratively and logistically. The most complete historical record of project technical activities, financial flows and administrative decisions that exists is in the Secretariat files. The Secretariat produced a summary report of project execution, management and primary achievements that was extremely useful to the Evaluation Team.

## C. INIA

A.I.D. has worked for nearly two decades to establish an agency of research and extension with appropriate models of research and technology transfer for the circumstances found in Peru. The World Bank (IBRD) and the InterAmerican Development Bank (IDB) have also provided funding for much of that work in support of the National Institute for Agricultural Research (INIA) and its predecessor agencies. Although reorganizations and governmental changes of priority have impacted the agency, the basic programs of research and extension developed with so much effort have been kept alive.

Since the ATT project was directed to the continued development and transfer of needed technology, INIA was obviously a key player among the institutions involved, although efforts were also directed to gaining more private sector participation, and in some activities, leadership. At the time of design of ATT, INIA's immediate predecessor agency operated 24 regional research and extension centers

(research station numbers have varied widely and rapidly in recent years), on-farm trials and demonstrations, extension offices and related support services including soil testing. Plans called for relocating parts of the technology transfer functions into the private sector, but INIA remained the basic research agency for technology generation at the national level. A more detailed discussion of INIA appears in the section dealiing wiith Technology Generation.

D. UNALM/FDA

The National Agrarian University at La Molina (UNALM) is the traditional quality training institute in agriculture in Peru. Although economic and social circumstances over recent years have made the attraction and retention of top quality faculty difficult, and support for students at the masters level to finish thesis research almost impossible, the institution remains the leading source of agriculturally trained manpower in Peru. Its links with regional universities in Perú, many of whose agricultural faculty members are graduates of La Molina, also placed it strategically for supporting the generation and transfer of technology. The related Fundación para el Desarrollo Agropecuaria (FDA) administers funds provided for the university by donors including A.I.D., the World Bank, IDB and others.

E. ONA

The National Agrarian Organization was, at the time of the design of ATT, the major broad-based farmers' organization of national scope, and remains so today. During design, ONA counted approximately 245 organizations of farmers among its members, including commodity groups, water users associations, and special interest groups. Today, that number has ascended to 512 affiliated national, regional and local groups, alathough not all are members of ONA. These affiliations give it unique relationships with a wide variety of private sector, agriculturally related interest groups. Harnessing the capabilities of this organizational resource to contribute to the involvement and organization of private sector participation in the technology generation and transfer system motivated their inclusion in the project as a participating institution. ONA was specifically charged with helping to organize and implement a series of Technology Diffusion Centers, assisting them in becoming self-supporting as soon as possible. In 1992, they were additionally placed in charge of administering a Rural Women's Program to gain participation of women producers and bring them into the technology generation and transfer communication system.

F. A.I.D.

The Agency for International Development and predecessor agencies have worked in Peru since the creation of U.S. International Assistance programs. Over the past two decades, A.I.D. has worked to guide agricultural technology generation and transfer into models appropriate for the circumstances of Peruvian agriculture. While the financial resources brought to the task by A.I.D. have often been dwarfed by those of the World Bank and IDB, A.I.D. has gained a position of conceptual leadership respected by other donors, including other bilateral sources. The ATT project was intended to continue support for the models developed, while modernizing with needed private sector involvement, consolidation of programs, and support for improving human resource development in the sector within Peru.

G. NCSU/MIAC

Both North Carolina State University and the MidAmerica International Agricultural Consortium, especially Iowa State University, have long histories of work in support of the development of Peruvian agriculture. At the time of ATT design, NCSU was involved in the predecessor REE project, also concerned with research and technology transfer, and MIAC was implementing the APID project, concerned with agricultural policy development and analysis. Because of their knowledge of Peruvian agriculture, agencies, programs and circumstances, the participation of both institutions was continued as providers of the technical assistance team in support of ATT project implementation. That team was charged with strengthening linkages among individuals and organizations, both public and private, to integrate and coordinate the components of the project design. The goal was to generate a collaborative system of agricultural technology generation and transfer both involving and serving public and private interests and needs.

### H. MINISTRY OF AGRICULTURE

As the policy, guidance and compliance authority for public sector agriculture in Peru, the Ministry of Agriculture negotiated with A.I.D. the establishment of the project, and assigned oversight representatives to monitor and follow the project. The Ministry also participates prominently in decisions regarding the use of PL-480 generated counterpart funds.

The vision of the Ministry of Agriculture at design time may have been supported by the ATT project, although the Ministry tried early in the project to negotiate a reduced scale and expectation for the project because of the rapid changes ocurring at that time. Lack of success in that effort, and subsequent changes in Ministry outlook, have cooled the Ministry's support for the project somewhat. The current Ministry vision for the agricultural sector is very much in line with the USAID interest in developing the export sector, although they also feel the necessity of support for the rest (and majority) of the sector.

## III. INSTITUTIONAL ISSUES

### A. PROJECT DESIGN

Retrospective evaluation of a project design is more a subjective art than an objective science. In the best of cases, learning during the project has already led to the incorporation of the changes indicated. In the ATT project, so many changes in the environment of Peruvian government institutions, along with security concerns and international financial changes, have rendered many of the assumptions underlying the original design obsolete. To say that the original design was "bad" or "wrong" in its major features is more an exercise in second-guessing the futuristic capabilities of the designers than a meaningful comment on project preparation.

There are, however, a few issues regarding major points of the design that are of some concern to the evaluation team.

The vision of an improved technology generation and transfer system was sound, and remains so. Neither does the evaluation team find fault with the majority of the other individual elements of the project design. Research, technology transfer, public and private sector cooperation, training and education of specialists in both research and technology transfer, and improved communications are all important elements of a sound research and extension system. The difficulty lies in the large number of

those elements which were designed together in a project which obviously depended heavily on political stability and interinstitutional cooperation. Even granting the expectation of over twice the donation funding that eventually was available, the existing mistrust among institutions, and the inherent political instability in Latin America would have argued for a more modest set of expectations and objectives. Developing widespread and institutionalized interinstitutional cooperation in those circumstances is a slow process, yet the project outputs were inherently fairly dependent on that cooperation. In addition to defying logic regarding accomplishment, it created a nearly impossible project management task.

While technology demand and technology supply issues were addressed in the project paper, the emphasis in the Log Frame was on technology supply. In the best examples of agricultural development in Latin America today, research and extension are oriented to demand driven enterprise selection and support. Recognizing that the ATT Project was intentionally designed to continue a model of development worked out over the preceding 10 years, one realizes that enterprise prioritization was based on market and production potentials as perceived in the late 1970's and early 1980's, including the design of the REE predecessor project. ATT project designers expanded the six priority program elements of the REE project (rice, corn, potatoes, cereals, grain legumes and oil crops) to include Andean crops, tropical crops and livestock. The concern is that this expansion was more a matter of continuing support to existing research programs than a selection of potentially viable production and marketing systems. This is borne out to some extent by the fact that several additional research programs received ATT fund support when the World Bank and IDB suspended activity in response to debt repayment difficulties.

Another element which was to help guide the prioritization and policy establishment of the project, as well as to resolve inter-institutional coordination problems, was the Project Advisory Council, consisting of the highest level managers of the participating Peruvian institutions and the A.I.D. Office of Agriculture. The Council never functioned, and was discontinued before the project ended. The most important coordination and decision making powers were transferred to the Vice-Minister of Agriculture and the Chief of the Agriculture Office of A.I.D., who approved annual work and budget plans of the participating institutions, and made the necessary decisions to solve operating problems. Again, the lack of emphasis in project working documents on demand driven research and technology transfer allowed these very busy individuals to continue with the more traditional supply driven planning. It is very difficult to say that the original Project Advisory Committee was a design flaw without knowing the justification the designers had for believing that it would work. When it failed, however, the "fall-back" design was not adequate to carry out some of the critical policy decisions that should have guided more research effort to demand driven requirements.

The design attempted to bring about interinstitutional cooperation by defining roles for both public and private institutions, which needed to be performed in a cooperative manner to add up to a logical system of technology generation and transfer. As a design feature this was not inherently weak or misguided. Given the mistrust among agencies, one might have expected a more flexible design allowing for the inevitable difficulties in gaining cooperation. The major difficulty with this aspect of the project, however, was in implementation, to be discussed later.

## B. PROJECT IMPLEMENTATION

Implementation has suffered from so many factors outside the control of A.I.D. or any of the participating institutions that it is difficult to say whether or not some specific implementation decisions were incorrect. A.I.D. project managers have tended to concentrate on the documentation requirements,

which have certainly needed attention. There is less evidence that they worked closely with the institutions to influence technical implementation activities, although one of them initiated some new activities in 1991. The nine enterprise priorities and the related research and technological transfer programs that were selected by the project were not observed by INIA, at least early in the project, in the sense that several additional programs received ATT support funds. A.I.D. project managers apparently allowed the additional dilution of funding to help INIA keep programs alive that had been supported by the World Bank and IDB. This dilution of project resources undoubtedly reduced advances in targeted programs, but a decision which balances specific project objectives against protecting gains made over more than a decade of interinstitutional work and support is not to be criticized lightly.

In terms of strengthening the role of the private sector in guiding agricultural development related to research and technology transfer, FUNDEAGRO and ONA bore responsibilities which offered great hope. The difficulties of FUNDEAGRO in being a new agency, mistrusted by the other institutions, and burdened with trying to fund and monitor activities across a broad spectrum of the agricultural sector must be granted. Still, they were in the best position of any of the institutions to focus on the broad view of Peru's agricultural development direction, to identify and support the development of priority enterprises, to identify and help obtain outside technical expertise and investment (still admittedly very difficult for Peru), and to help select demand driven research and technology transfer activities for export agriculture on a priority base. They seem to have been somewhat over concerned with being involved directly in technology transfer in some way rather than assisting the private sector in preparing to participate on a much broader basis.

The potential for producing interinstitutional cooperation by assigning roles to various institutions and funding their implementation was severely inhibited when the majority of funds were passed through FUNDEAGRO. Giving them responsibility for funding activities in other institutions, and for monitoring the subsequent use of the resources heightened interinstitutional mistrust, and gave FUNDEAGRO an image of a public sector funding agency instead of a private sector support and development agency. Successful models of Foundation-led and supported private sector involvement in agricultural development were available in Chile (Fundación Chile), Ecuador (FUNDAGRO), El Salvador (FUSADES) and to some extent in Guatemala (Asociación Gremial). The difficulty was in burdening FUNDEAGRO with the financial management and monitoring functions which it neither desired nor was well prepared to handle. Resulting irregular flows of funds were a constant problem. Existing mistrust between public and private sector institutions, and among institutions especially in the public sector, were amplified by the need to depend on one another for funding. The team recognizes that a major reason for using that pattern of funding was the shortage of monitoring manpower in USAID/Perú. Unfortunately, USAID may yet have to assume the responsibility for getting liquidation on an institution by institution basis, so that final activities can be funded and/or the project closed out. Funding each responsible institution directly for its activities might well have resulted in better funds management, and certainly would have reduced interinstitutional friction..

The evaluation team also feels that forming the FUNDEAGRO Board of Directors from institutional representatives has limited the flexiblity and entrepreneurial spirit of the institution. Increasing the private sector representation will help, but Board members should be chosen for their individual merit, and not be in a position of representing another entity while making decisions regarding FUNDEAGRO business operations.

ONA's role in establishing and supporting Technology Diffusion Centers did not go well. One could argue that the sector was not yet ready for private involvement of that type. On the other hand,

such enterprises would need the support of many of the agreements and research links, both domestic and international, which were called for in the Log Frame, but which have not been developed. ONA is a representative and lobby organization, and has never seen many of the project objectives as its own. This is one instance where the project management responsibilities were so great, and the management available, including USAID, FUNDEAGRO and NCSU, were unable to cope with this lack of commitment in guiding ONA in the implementation of its assigned responsibilities. In ONA's defence, it is not apparent that great efforts were expended in that attempt.

North Carolina State University and the MidAmerica International Agricultural Consortium (NCSU/MIAC), the latter represented by Iowa State University, were both active in Peru prior to the initiation of the ATT Project. Through their involvement in the REE and APID Projects, both contributed to the definition of the vision of an improved research and technology transfer system which was ultimately adopted in the design of the ATT Project. Several of the same individuals from the REE and APID Projects became members of the advisory team for the ATT Project.

Technical advisory support for the research programs of INIA, the seed program, and the human resource development component, mostly areas which were parts of the concept of research and technology transfer in which these institutions participated in developing, appear to have been well conceived and executed by the NCSU/MIAC advisory team. Assistance to UNALM in curriculum design reportedly resulted in a number of curriculum design changes which have yet to be approved and implemented. Judgements of the success of those advisory efforts must await the opportunity to observe the curriculum changes in operation.

Advisory support to the technology transfer component contributed to the establishment and selection of institutions called for in the project design, such as private technology transfer enterprises. These were not necessarily elements of the concept these institutions helped develop, and the evaluation team found little evidence that advisors questioned the economic weaknesses of such entities or their illogical positions in the technology transfer chain. In their defense, it must be said that functions of advisory teams do not ordinarily include significant changes in project design during implementation. The feeling exists, however, that the advisory team supported well those aspects of the project design that they agreed strongly with, but were much less creative in their support of other design elements.

It is difficult to judge the influence exerted by the advisory team on interinstitutional collaboration. Support for the Coordinating Committee almost certainly helped such collaboration at that level. Expatriate advisors normally exert limited direct influence on interinstitutional attitudes and relationships, but skilled advisors learn indirect ways to promote such collaboration by organizing activities in ways that encourage cooperation in the interests of the institutions invovled. The difficult interinstitutional environment in Peru during the period of the ATT Project made direct influence even more unlikely than usual. The limited evidence seen by the evaluation team would indicate that advisors did not exercise their full capabilities to positively influence collaboration by seeking opportunities for complementary action in support of agreed upon objectives.

## C. RELATIONSHIP BETWEEN UNALM AND FUNDEAGRO

The present relationship between UNALM, especially the graduate school, and FUNDEAGRO is reported to be cooperative and highly functional in supporting the training programs of the project. Considering the very tense and troubled relationship which earlier existed, this situation constitutes a major improvement. However, it was not apparent that this relationship had in any way become a

network of interdependent and collaborative institutions, as envisioned in the project paper. Problems in funds flow and accountability through the university's foundation, FDA, continue to be reported by project management staff as of the writing of this paper.

## D. POLITICAL AND INSTITUTIONAL CONTEXT CHANGES

Many of the conditions considered assumptions in the log frame did not remain true and stable during the life of the project. The fact that the project continued to train participants and conduct institutional strengthening activities under these difficult circumstances is a credit to the enthusiasm and commitment of people in all the participating agencies. In fact, although the project's design was strongly influenced by the "big government" model of previous administrations of the GOP, the project management staffs of the implementing institutions were able to adjust the program to somewhat accommodate the changing political/institutional environment. One such major environmental change was the elevation of the former rector of UNALM to the Peruvian presidency, bringing with him an agenda of slimming down government, reduction of regulation on the private sector, more rigorous tax collection efforts, liberalization of the land tenure system, changes in the agricultural input delivery system, and elimination, sale or privatization of many state owned monopolies in the agricultural and other sectors. Another major factor was the insurgent terrorism and random violence which undermined expectations of stable working conditions in all governmental institutions. The GOP practically eliminated the agricultural extension infrastructure in the public sector as a cost cutting and security measure. These conditions have drastically altered the economic climate in which agricultural research, extension and education are currently taking place. The project design, for instance, envisioned that the long term training would be primarily allocated to INIA and UNALM. Current conditions dictate that the government's ability to absorb more highly trained staff is extremely limited and that the kind of training needed should be directed at economically viable productive enterprises which will generate employment and income in the agricultural sector.

The project was envisioned as a means to continue to support Peru's efforts in Research, Extension, and Training for Agricultural Development at a time when relations between Peru and the donor community were strained due to a GOP failure to keep commitments made in prior international aid agreements. Design emphasis was placed on utilizing non-governmental institutions to channel aid funds, partly for debt repayment reasons, and partly to simply get them more involved directly in development. Now, relations are not as strained and AID should explore means of working appropriately with both private and public sector institutions. Specifically, the channeling of most project funds through FUNDEAGRO creates unnecessary inter-institutional tensions and diverts FUNDEAGRO from its primary mission because of excessive attention required by complex funds documentation and management procedures.

## E. ISSUES AND RECOMMENDATIONS

Some of the more specific institutional concerns are discussed below:

**ISSUE 1.** The selection of inappropriate organizations, and unnatural, artificial approaches to do technology transfer.

<u>Discussion</u>

Although it may have seemed at project design stage that ONA and FUNDEAGRO could be

effective technology transfer organizations, they have not been very effective and their activities have tended to be expensive.

Neither ONA nor FUNDEAGRO has natural day to day links to information/research results technologies, neither is involved in technology generation, and neither has particular capability in technical information management and use. Their involvement in technology transfer is "artificial". ONA is a producer organizer and representative organization of the producer lobby organization type. FUNDEAGRO had various objectives, functions and planned services, but except for the seed program, it has been made a funding source organization, contributing little on a sustainable basis to technology transfer needs.

Recomendations

Suggested roles for each Agency are discussed in the Future Direction section, attached to the Executive Summary.

ISSUE 2. Inappropriate coordination and flow of funds to support project activities.

Discussion

Project designers apparently hoped that channeling funds though FUNDEAGRO to the other participating organizations would improve relationships, and encourage coordination and cooperation, but it has not worked well. All participating organizations feel they are not getting enough support funds, and that FUNDEAGRO and the Secretariat are spending excessively. Instead of promoting cooperation, the system has exaggerated interinstitutional mistrust, has distracted FUNDEAGRO from it's planned role in supporting private sector involvement in development, and given it a negative image in the agriculture and agroindustrial sector.

FUNDEAGRO was so preoccupied with managing and disbursing project funds that it failed to develop the marketable services that it should have, and it has been seen primarily as a funding source.

Recommendations

Reduce the high cost of project coordination. Reorganize funds administration by FUNDEAGRO to facilitate rather than direct activities, and directly fund most participating organization activities based on performance of high priority project support activities.

ISSUE 3. All of the private foundations, including the CODESE's, the foundations at experiment stations transfered by INIA (Chira, Vista Florida, etc.), FONAGRO, Santa Rita Cooperative and FUNDEAGRO, lack financial sustainability.

Discussion

Most of the foundations exhibit a lack of urgency to restructure to become financialy sound businesses. There is a high degree of dependency on funding from GOP, USAID, and other donors. The financial weakness of the foundations is a major problem in the current agricultural sector, and requires attention soon.

Recommendations

One recommended strategy for solving the problem might be:

1. Restructure and strengthen FUNDEAGRO sufficiently to define, package and price its services (see Future Directions section regarding the recommended FUNDEAGRO role), and give it the capability to provide business development assistance to the other foundations.

2. With support from the "New" FUNDEAGRO, develop business plans for each of the foundations.

3. Continue support to the foundations on a declining basis, gradually reducing dependence on GOP and international donors.

4. Monitor the progress being made by each foundation, and discontinue support to any whose progress is not acceptable.

ISSUE 4. Lack of Production and Marketing Systems Approach Emphasis In Priority Selection

Discussion

During the project all participating organizations have carried out technology transfer activities, including meetings, seminars, field days, TV and radio announcements, bulletins, leaflets, magazines and newspaper articles and supplements. However, there seems to have been inadequate concentration on the identification of technologies most needed to advance specific targeted crop production and marketing systems.

In both technology generation and technology transfer, strong emphasis has been placed on variety development while little emphasis has been given to critical technologies in water management, salinity control, harvesting, post harvest management, marketing, and other elements of the production and marketing system.

Recommendations

Priority crops and Agro-industries should be identified, and new work plans in all agencies developed, so all know and agree that they are working to develop complete production and marketing systems for the same targeted crops and agro-industries

ISSUE 5. Inappropriate Strategy For Transfer of Technology and the Widespread Application of Technology

Discussion

Researchers, change agents, and producers must be involved together in identifying, generating and obtaining, and applying appropriate technologies. They must combine their different roles to solve major problems. Their involvement should be close enough to assure that the researcher is seeking the

answers that the producers and agro-industrialists need.

It is important to involve and train inputs dealers and distributors, agro-industries, bankers, cooperatives, and producers groups since they play major roles in obtaining widespread application of improved technology. As one example, if an inputs supplier stocks, sells and provides recommendations for the correct use of the right seed, fertilizer and other inputs, they can significatly contribute to the transfer and widespread application of technology. Any supplier or buyer who emphasizes appropriate technology use is a major change agent in the production regions. Of course, there remain many other technologies that must be dealt with, such as irrigation water management, other cultural practices, credit management, harvesting, post harvest management, and marketing, to mention only a few.

University faculties and upper level students can also be a major force in the transfer of technology. Although UNALM's transfer of technology activities have been somewhat inconsistent and have lacked a systems approach, they have had reasonable success.

INIA researchers, UNALM, local university faculties and senior level students, private foundations, inputs distributors, and marketing cooperatives or associations appear to be the key organizations best suited to establishing effective transfer of technology within the agriculture/agro-industry sector.

Recommendation

1. Make major changes in the strategy to be used for the transfer of technology in the Agricultural sector.

2. See Future Direction section of this report for more detailed recommendations.

## F. POTENTIAL INTERINSTITUTIONAL DEVELOPMENTS FOR STRONGER SUPPORT OF EXPORT AGRICULTURE IN THE FUTURE

USAID/Peru should consider providing support for structuring Fundación Peru and restructuring FUNDEAGRO to engage in programs of technical and financial (through PL-480 or other sources) assistance to the private sector. Fundación Peru could provide invaluable support for the foundations and associations which are taking over management of selected coastal agricultural research stations from INIA. The private groups need help in organizing to generate income from commercial operation of parts of the research stations, for locating other sources of funding, and for setting up high priority research and extension programs.

FUNDEAGRO could, and probably should, have a critical role in the future development of a diversified commercial agricultural, agro-industry sector in Perú. To do so successfully, it needs to tighten its focus and gain new capabilities to concentrate on developing and providing marketable services which support private agricultural production, agro-industry and agribusiness development. FUNDEAGRO's marketable services should include, but not be limited to, providing the following services for a fee:

a. Manage development assistance funds.

b. Manage projects.

c. Provide support services to projects, or proposed projects in the agriculture/agro-industrial sector, such as:

- preparing proposals
- reviewing proposals
- preparing investment models
- preparing loan applications
- reviewing loan applications for banks

d. Develop business plans and strategies for:

- new commercial agricultural firms and agribusinesses
- restructuring and/or expanding existing businesses
- developing marketing strategies
- defining, packaging and pricing marketable services

e. Improving agribusiness operations

- provide business management systems
- develop strategies for reducing operational cost in agriculture/agro-industries

f. Consulting services

- provide high level local and international consultants thoughout the agricultural sector.

g. Dynamic "hot sheet" newsletter

- prepare, market and distribute a 2 to 4 page news letter every two weeks with current, imperative information and data for the modern agriculturist, banker, and investor, both public and private. The news letter should have a focus on business, investment opportunities, costs and prices, and marketing.

With the proposed new IDB project poised to pick up external financing for INIA and other organizations in the national agricultural technology generation and transfer system, future USAID assistance to agricultural research, extension and education should be through a collaborative ADEX/FUNDEAGRO/Fundación Peru program to support an integrated, market-based approach to expanding exports of selected agricultural products. Under such a program, ADEX, FUNDEAGRO and Fundación Peru would play catalytic roles to bring together the various actors involved in the production, post-harvest handling, processing, transport and marketing of selected commodities. This would include farmers, processors, exporters, bankers, research and extension programs both in the public and private sectors and in the university community.

The program should start from a strong market orientation, with ADEX identifying specific markets and buyers, determining the needs of those markets in terms of quantity, quality, presentation and timing. This information should then be fed back down the processing and production chain to assure

that those requirements will be met. Fundación Peru should support the private research stations by assisting with financing, promoting good management and the generation and testing of specific technologies needed by the system. FUNDEAGRO should work on the production end, assuring that requirements of the target markets are met, including helping farmers organizations to meet planting and harvest schedules, in controlling quality and in determining research and extension priorities and who should work on them. The three organizations should work together to assure that financing, management and other constraints are identified and dealt with.

The three organizations would not actually be involved in production, processing, financing, management etc. but would be catalysts to bring people together to asssure that these elements are being addressed. The program should work in only three or four areas initially, to concentrate sufficient resources to have a major impact on boosting exports. Additional areas and products may be taken on as the program gathers experience. Some commodities and areas for possible involvement in such a program include mangos and limes in Piura, selected vegetables and grain legumes in Cañete, Chincha, and Ica, tropical fruits for juices, concentrates, and canning in Chanchamayo. The organizations should work together to identify the three or four areas/commodities which show the greatest prospects for success and then move into an integrated program in each area.

A new unit is needed in the technology generation and transfer system of the agricultural sector to analyze, interpret and develop applications for information and technology in support of commercializing the production and marketing systems of specific crops and developing agro-industries. The new unit could support agricultural sector decision making, policy formulation, commercialization, agricultural industrialization and exports to achieve a higher level of appropriate function than is possible with current information. Due to the great diversity of production areas, crops, and sub-cultures, the technology transfer effort in Peru requires a programmatic, comprehensive "ground truth" approach to selecting priority crops in specific areas for commercialization, industrializing and exporting. Many kinds of inputs are needed in such an approach, including: market information and technology from outside sources; knowledge of local and national resources such as soil, water, and climate; local research results, economic data, policy requirements and restrictions; information from farm level data, national census data; and other information about specific problems and opportunities in the specific producing areas.

The proposed analytical unit is needed to bring together, interpret, analyze and use appropriate technology, data, and information to help develop complete production and marketing systems for specific crops and products. The proposed unit should:

- - develop demand driven statistical data bases for targeted areas and high priority crops.

- - Maintain a technical and agribusiness library and information reference center with appropriate linkages to both in-country and foreign information and technology sources.

- - develop profiles of:

  - specific areas targeted for commercial production of industrialized and export crops
  - production and marketing systems for specific priority crops and products which identify major problems and opportunities

- - interpret and analyze technology, information and data for use in:

- selecting priority crops
- selecting priority sites for organized commercial production
- developing strategic plans for commercializing specific targeted crops
- preparing agribusiness situation reports for specific crops or agro-industries
- developing investment models for specific crops or agro-industries

The analysis, profiles, situation reports and investment models done by the unit should be made available to the appropriate public and private organizations within the agricultural sector. The work of the unit will also be highly useful to the GOP in policy formulation, and to banks in evaluating loan applications. The proposed unit probably should be located in or near the ADEX, FUNDEAGRO and Fundación Peru complex discussed above.

## TECHNOLOGY GENERATION

There were three activities included in the Techonology Generation component of the Agricultural Technology Transformation Project:

a. Consolidation and Integration of INIPA Research Programs;

b. Strengthening INIPA Administration and Management

c. Expanding Research Opportunities

This section of the Evaluation will examine the two INIPA/INIAA/INIA activities together and then the third activity involving FUNDEAGRO and UNA, including a brief description of what happened over the course of the project, a comparison of the End of Project Status envisioned in the Project Paper and the situation encountered by the Evaluation team, and a discussion of the Evaluation Team's conclusions and recommendations.

### I. ACTIVITIES 1A and 1B. CONSOLIDATION AND INTEGRATION OF INIPA RESEARCH PROGRAMS AND STRENGTHENING INIPA ADMINISTRATION AND MANAGEMENT

#### A. BACKGROUND

These activities were intended to build upon the advances achieved under AID's predecesor project, Agricultural Research, Extension and Education (REE). Under REE, AID and GOP counterpart resources were focussed on five national commodity programs: rice, potatoes, corn, grain legumes and cereals. In the ATT project design, the number of national commodity programs was increased to nine, continuing the five programs started under REE and adding funding for support of programs in livestock, oil seed crops, tropical crops, and Andean crops. Funding was also provided for six national research support programs in germplasm services, computer services, laboratory services, agroeconomic services, integrated pest management, and soils and water research. Project activities were to be carried out in 23 research stations.

At the time that the ATT PP was being finalized in 1987, there was a major reorganization of the public sector research and extension system which broke the extension program away from INIPA and placed it in the Ministry of Agriculture. Thus all of the positive progress which had been made in integrating research and extension under the REE project was lost. As a part of the 1987 reorganization, the Institute of Forestry and Fauna (INFOR) and the Institute of Agro-Industrial Development (INDAA) were joined with the research element of INIPA to form the National Institute of Agrarian and Agro-Industrial Research (INIAA).

During the project design process, the amount of AID funding was cut from an original target level of $60 million to a final approved PP level of $25 million. Thus as the program got underway, the number of research programs to be funded with project resources had been increased from five to 15 and the amount of money originally programmed had been cut by more than 50%. In addition, a number of ongoing research activities were added to the INIAA portfolio with the accession of the INFOR and INDAA programs. To further complicate matters, the World Bank and IDB, which had been major funders of public sector research and extension, terminated their support to INIAA because of problems with the Garcia administration. Also, anticipated counterpart contributions were not made available in

the early years of the proejct. Thus, the ATT project, which was basically the only major remaining source of external financing for INIAA's program, came under increasing pressure to fill the gap caused by these events and to maintain the momentum of ongoing programs. As a result, project resources were spread increasingly thinly across a large number of activities, with a decrease in the quality and number of research achievements. This situation continued through most of 1988 and 1989 as the entire country took a nose-dive with run-away inflation and a dramatic deterioration of the situation in the cities and the countryside caused by the Sendero Luminoso and the MRTA. AID and NCSU were aware of the deterioration of the research effort because of the dispersion of resources across too many activities but did not or could not do much about it. In 1989/1990 INIAA began to cut resource flows to selected research stations and programs, principally because of security considerations.

Throughout this period, INIAA continued to hold annual planning meetings to establish targets and program funds for individual commodity and research support programs. Budgets were made upon the basis of these plans and the funds were then disbursed to the research stations. At this point, the system broke down as the research station directors had complete control over the funds for their stations and could distribute them as they wished without regard to national plans and priorities. Individual commodity programs went further into a slump and most programs were basically in a low-productivity holding pattern.

In December 1989, 17 research stations were transferred to the regional governments by the Garcia administration. Fifteen stations were retained by INIAA and INIAA continued to pay the salaries of personnel assigned to the regional government stations while the regions were responsible for station operations and maintenance. Administrative havoc reigned and the regional government stations went into a decline which continued until the stations were returned to INIAA in January, 1993.

In July 1990, the Fujimori administration assumed power. INIAA was a bloated, disorderly mess. Shortly before leaving office, the Garcia administration appointed 1500 additional employees to INIAA, raising the number to 5700. As part of a government-wide campaign, the Ministry of Agriculture and the leadership of INIAA began a systematic campaign to reduce the number of employees in INIAA. Through a combination of dismissals and incentives for voluntary early retirement the payroll was reduced to 3850 in February of 1991, 1900 by the end of 1991, 1500 by the end of 1992 to a current level of 782 slots in June, 1993.

As this reduction in personnel was going on, the leadership of INIA began to cut back on the number of programs and research stations receiving assistance under the ATT Project. With the transfer of 17 stations to the regional governments in late 1989, the ATT project was supporting programs at 15 stations in 1991. This was reduced to 10 stations in 1991 and 1992. The number of programs receiving support has also been reduced from 21 in 1990 to 17 in 1992/93.

In 1992, the government initiated a program to transfer management of eight coastal research stations to private sector foundations or associations. The experience to date has been uneven, with some foundations/associations doing quite well in taking responsibility for management of the stations and others not doing well at all, with their contracts under review or withdrawn. Under the transfer agreements, the associations are given use of the stations for 10 years, subject to compliance with conditions contained in an agreement with INIA. INIA has agreed to continue financing the work of selected national research programs and a reduced number of INIA staff for a period of two years. The future disposition of these personnel will be decided at the end of two years with the hope that the foundation/association can assume payment of the salaries of most, if not all, of the INIA staff from

revenues generated by the stations. The Executive Director of INIA described this move to privatize the coastal research stations as an "adventure" where all parties are learning as they go.

In a complementary move, the government has supported the formation of a new private sector organization called Fundacion Peru. Richard Sawyer, the former Director General of the International Potato Center, is its President with directors elected from among the foundations/associations which are taking over the coastal research stations. It is the government's hope that Fundacion Peru can assist in this transition by finding and channeling domestic and external resources to the foundations/associations.

B. END OF PROJECT STATUS

a. Condition expected: "INIPA will have established itself as a reliable and sustainable leader in the ATG&T system in Peru and the private sector and agricultural university participation will be well established and expanding on a self-sustaining basis."

Current Status: INIPA was disbanded in 1987, with research moving to INIAA and extension to the Ministry of Agriculture. Its successor organizations, INIAA and INIA have gone through some very tough times over the past five years. Many experienced researchers took advantage of incentives offered by the Fujimori government for early retirement. However, it appeared to the Evaluation Team that a substantial number of good personnel (including most of the technical staff contracted through ATT) had decided to remain with INIA and are doing good research despite the many problems they have had to face. While INIA is still clearly the leading agricultural research organization in the country, its problems (and the general problems of Peru) over the past several years have made it difficult for INIA to establish itself as either a "reliable" or "sustainable" leader in the AGT&T system in Peru. Three reorganizations in six years have caused dislocations and disruptions in ongoing programs, which have undermined its reliability. With respect to sustainability, INIA still relies heavily on external support, principally through ATT and PL 480. The recent moves to reduce staff have lowered INIA's funding requirements to a level which is closer to what the GOP may be able to afford over the short and medium term, although there will probably continue to be a significan short fall which will need to be filled by external sources such as the proposed IDB agricultural sector loan.

The Project has contributed to increased private sector and agricultural university participation in the AGT&T system through providing funding for programs such as the FUNDEAGRO research grants program, the UNA research program and the FUNDEAGRO Technology Transfer Enterprises and seed programs. However this participation is neither expanding nor on a self-sustaining basis, with the possible exception of a few of the departmental seed committees.

b. Condition expected: "Agri-businessmen, GOP leaders and the general public will value the ATG&T system contributions to their individual and collective economic and social well-being, and support sustained levels of public funding to maintain ATG&T system capabilities. Farmers will be active and vocal in seeking improved technologies that are more reliable and profitable than that which they now are using and they will be contributing significant resources to ATG&T activities."

Current status: There appears to be an appreciation of the value of agricultural research, but this does not seem to have translated into sufficient sustained public sector funding to fully support the AGT&t system. The farmers that the team encountered were interested in obtaining improved technologies that are more reliable and profitable but were not contributing significant resources to that

end with the possible exception of some of the private research stations such as those in Canete and Canete, but these stations were being supported by participating farmers even before the ATT project began.

c. Condition expected: "A national ATG&T system is producing and disseminating new and relevant technologies in a form and manner that responds to the needs of a wide range of farmers in Peru, and adoption rates are increasing."

Current status: INIA, as part of the national ATG&T system, is producing new and relevant technologies in a number of areas. Most appear to respond to farmer needs, including new varieties that are resistant to disease and pests and tolerant of drought, salinity and cold. The technology dissemination function virtually disappeared when extension was moved to the Ministry of Agriculture in 1987 and essentially stopped functioning. INIAA tried to carry out some technology dissemination with existing personnel, but were only able to do so on a limited scale. Time and available information did not allow the team to judge whether adoption rates were increasing, although it appears that some of the technologies such as new rice, corn, bean and potato varieties have been used by a large number of farmers.

d. Condition expected: "INIPA is effectively planning, managing and evaluating Peru's agricultural research needs and priorities at both national and departmental levels, and sharing that information with other parties in the ATG&T system in a manner that results in the generation of increased and more relevant research outputs."

Current status: INIA's record in planning, managing and evaluating Peru's agricultural research needs and priorities has been uneven. Annual planning exercises were held over most of the course of the project but hard choices on priorities were not made as INIA spread its resources thinly over a large number of activities. There was limited sharing of information with other parties through publication and diffusion of publications and through informal, personal contacts.

e. Condition expected: "Improved legal and institutional structures are in place and functioning for more effective recruitment, placement and retention of adequately trained and experienced scientific and managerial personnel in INIPA."

Current status: INIA has made significant progress in reducing the number of people on its payroll, going from 5,700 people in 1990 to 782 slots in June 1993. In 1993, INIA personnel were moved from regulation as a public sector organization to regulation as a private sector organization. All personnel are now under one year contracts rather than civil service appointments. All employees who stayed with INIA had to resign or retire from public service and then became contract employees of the organization. This provides an excellent opportunity for INIA to upgrade the quality of its staff by terminating contracts of non- or low-performance employees and adding better qualified, more energetic contract employees.

Salaries remain a problem. The basic salary for professionals and technicians in INIA ranges from US$65/mo. for technicians and US$70/mo. for entry level professionals to $117/mo. for top level administrators. There are 14 monthly salaries paid with annual salaries ranging from $910 to $1638. There are efforts underway to supplement these base salaries with funds from an account called the Fondo

de Asistencia y Estimulo (CAFAE). Various administrative maneuverings appear to be going on to use this fund for raising salary levels. This should be a positive stimulus for retention of INIA staff. If properly managed, along with improved performance evaluation and recruiting practices, it should contribute to building a stronger, better qualified and more highly motivated staff.

f. Condition expected: Long term institutional linkages have been established and are functioning between the Peruvian ATG&T system and a wide range of researchers and research institutions outside Peru."

Current status: The national programs in rice, corn, beans and potatoes have maintained contact with CIAT, CIMMYT and CIP through project sponsored training programs and through interaction with resident or visiting scientists from the three international centers. There are contacts with other researchers outside Peru but on an ad-hoc, personal basis.

g. Condition expected: Operational linkages are in place among public sector national and regional agricultural research and extension organizations, and the private sector and with agricultural educational institutions."

Current status: Official agreements have been made between INIA and the foundations/associations that are taking over selected coastal research stations and there is considerable interaction between the two groups at this time. The team was informed that there are other agreements between INIA and other public, private and educational organizations but that there is usually little formal interaction. There is a good deal of interaction between individual researchers but most of it is on an ad hoc, personal basis.

## C. CONCLUSIONS

a. Despite all of the problems it encountered over the life of the project, INIA and its predecesor institutions ended up doing a fairly good job. A significant number of new varieties and technologies were developed. But, perhaps most important, a methodology for carrying out research and extension was developed and internalized within the organization. This methodology tries to involve farmers in setting priorities, tries to concentrate resources on solving specific problems, emphasizes cooperation with external and internal research organizations and tries to get research results out to farmers in a way that they can use them. The team encountered a large number of researchers in the field who had internalized these principles and who showed great enthusiasm for their work despite low salaries, uneven support and waves of politicization of their organization over the years. AID and its contract technical assistance personnel can rightfully claim credit for helping to bring this about through the ATT project, which built upon the base established by the predecessor REE project. In many ways, INIA has reached the point where it can continue without a lot of external technical assistance although it continues to need external financing to augment the funds available from the public treasury and its own sources.

b. One area which does require continued attention is the tendency of INIA to try to do too many things, spreading resources too thinly so that programs are merely scratching the surface and are not getting sufficient funding to really come up with important research results. Now that there are greatly changed circumstances within the country (i.e., free importation of agricultural commodities, severe lack of credit, water availability and salinity problems, the dramatic reductions in INIA staff, etc.), it is extremely important that INIA engage in a new priority setting exercise that takes into account these new

realities. The last major priority setting exercises were carried out in the early/mid 1980's and conditions have changed dramatically since then. INIA can not continue to try to work in a large number of programs but must decide on a limited number of research activities which require public sector funding, leaving other research for other organizations or to be done at another time.

c. INIA has tried to involve farmer/clients in determining research and extension needs. This process should be continued and enhanced. The methodology for involving clients in determining research needs should be continually promoted and supported within INIA. It should also reach out to other clients such as agro-industry processors and exporters and also to potential collaborators such as private sector firms and organizations and the national and regional universities. The annual planning exercises should be continued, but with much greater involvement of clients and collaborators, particularly at the local level. The establishment of the National Directive Council is an important step toward increased private sector and university participation in setting INIA's research agenda. The Council should take on the issue of how to increase involvement of clients and collaborators in INIA's planning process as one of its primary challenges.

d. The move to turn over management of selected coastal research stations to private sector foundations/associations is a bold move, but fraught with potential problems. Agricultural research, particularly in basic food crops, is generally recognized as a public good, with limited incentives (particularly in Peru) for private sector involvement. It is likely that INIA will have to retain some responsibility for food crop research. The leadership of INIA recognizes this need and plans to continue funding national food crop program research at the privatized stations for at least two years, until a functional system of collaboration with the private sector organizations can be worked out.

The performance of the private sector organizations to date has been mixed. The team saw examples of private sector organizations which seem to have a good idea of how they can generate resources and organize and fund research and extension programs such as the Fundacion Hualtaco in Piura, the group in charge of the Santa Rita station in Arequipa and the Associacion Pro-Ica in Ica. Others have encountered problems such as the organizations involved with San Camilo in Arequipa and Vista Florida in Chiclayo. These organizations require assistance (from Fundacion Peru or FUNDEAGRO) in organizing themselves to collaborate with INIA and to generate funds to support research and extension programs.

e. The down-sizing of INIA is an important and positive accomplishment as is the tranfer of INIA to regulation by laws governing private sector employment. INIA now has the ability to control the quality of its staff through objective performance evaluation and terminating the contracts of those employees who do not perform up to established standards. The ultimate size and composition of the INIA staff should be tied to the requirements established by a major priority setting exercise and to a realistic assessment of the prospects for long term public treasury support. Ultimately, INIA must gear its size to what the government can afford. One of the problems of the past has been the inflation of research and extension programs with borrowed funds and the inevitable down-sizing when external assistance terminates. There can and should be continued external assistance such as the proposed new IDB loan, but INIA should point towards a program level which can be funded largely through the public treasury and income generated by INIA's own activities. Establishing this sustainable program level should be an important agenda item for the Consejo Directivo of INIA.

f. The planning/programming changes introduced by the ATT project in 1991/92 are an important contribution to an efficient INIA. This system should be maintained and applied system wide

within INIA at the earliest opportunity.

g. The integrated research and technology transfer strategy developed by INIA seems logical and a good use of all existing resources. Building upon the CTTA model, which has gained wide-spread acceptance in INIA, the new strategy emphasizes the need to diffuse technology through the use of intermediary "proveedores de assistencia tecnica" (PAT's) such as farmers' organizations, other non-governmental organizations and national and local universities. This puts the burden on INIA "transferistas" to prepare good training programs and supporting technical materials for the PAT's.

## D. RECOMMENDATIONS

a. USAID/Peru and the GOP should work together to find a way to provide "bridge financing" to allow INIA to retain the personnel who have been contracted under the ATT Project and to continue funding research support costs for ongoing, high priority research efforts until funding becomes available under the IDB Agricultural Sector Loan. If funding for such purposes were to be cut off on August 31, 1993, INIA stands to lose a large number of some of their best people. Research programs would stop in mid-stream for lack of operating support funds, losing the momentum of years of effort. According to GOP and IDB sources, a steady flow of funding under the new IDB loan will not be available until towards the end of 1994. The bridge financing should be sufficient to cover critical costs until the end of CY 1994.

b. USAID/Peru should offer to provide funding for a small, high-level external technical assistance team to work with INIA on establishing a new, multi-year set of research and extension priorities. This would replace the basic priority structure established in the early/mid 1980's. A systematic methodology, such as that developed by George Norton of Virginia Tech, should be used. Priorities should be based on current realities including such factors as competition from imported commodities, credit requirements and availability, local, national, regional and international market needs and prospects, water availability and technology, prospects for research and extension programs which could be carried out by other organizations with assistance from the proposed IDB research/extension grants/loan fund. The prioritization should be based upon the comparative advantage of Peru's varied regions and how these fit in Peru's overall domestic supply and regional and international trade picture. The prioritization process should be a highly collaborative effort, involving INIA, leading producers and agro-industrial processors and exporters and potential collaborators from the private sector and university community. The process (which would be similar in length and level of involvement to the Agricultural Research, Extension and Education base-line study conducted in the late 1970's) should take four to six months to develop a research agenda which should be reviewed at regular intervals (every four to six months for the next two years) by members of the external technical assistance team to help assure that INIA is not succumbing to the pressures to stray from the established priorities. The IDB should also participate in reviewing the agenda and incorporate it as a leading element of their agricultural sector loan agreement.

c. INIA should emphasize farmer/agro-industry and private sector/university collaborator participation in its priority setting exercise described above and also in its annual research planning exercise. The National Directive Council of INIA should make this kind of collaboration a high priority item on its agenda. The results of these efforts should feed into the development of the National System of Agricultural Research and Technology Transfer System proposed under the IDB Agricultural Sector Loan.

d. USAID/Peru should provide support for either Fundacion Peru or FUNDEAGRO to engage in a program of technical and financial (through PL-480 or other sources) assistance to the private sector foundations/associations which are taking over management of selected coastal agricultural research stations from INIA. The private groups need help on organizing to generate income from commercial operation of parts of the research stations and on setting up high priority research and extension programs.

e. USAID/Peru should offer to fund a technical assistance team to work with INIA on reviewing and improving its performance evaluation and recruiting and new employee evaluation processes. These systems must be improved if INIA is to be able to systematically upgrade the quality of its staff.

f. With the proposed new IDB project poised to pick up external financing for INIA and other organizations in the national agricultural technology generation and transfer system, future USAID assistance to agricultural research, extension and education should be through a collaborative ADEX/FUNDEAGRO program to support an integrated, market-based approach to expanding exports of selected agricultural products. Under such a program, ADEX/FUNDEAGRO would play a catalytic role to bring together the various actors involved in the production, post-harvest handling, processing, transport and marketing of selected commodities. This would include farmers, processors, exporters, bankers, research and extension programs both in the public and private sectors and in the university community.

The program should start from a strong market orientation, identifying specific markets and buyers, determining the needs of those markets in terms of quantity, quality, presentation and timing. This information should then be fed back down the processing and production chain to assure that those requirements will be met. ADEX should concentrate on identifying the markets and determining market requirements. FUNDEAGRO should work on the production end, assuring that those requirements are met including helping farmers organizations to organize to meet planting and harvest schedules, in controlling quality and in determining research and extension priorities and who should work on them. ADEX and FUNDEAGRO should work together to assure that financing, management and other constraints are identified and dealt with.

The two organizations will not actually do the production, processing, financing, management etc. but will be a catalyst to bring people together to asssure that these elements are being addressed. The program should work in only three or four areas initially, to concentrate sufficient resources to have a major impact on boosting exports. Additional areas and products may be taken on as the program gathers experience. Some commodities and areas for consideration for involvement in such a program include mangos and limes in Piura, selected vegetables and grain legumes in Canete, Chincha, and Ica, tropical fruits for juices, concentrates, and canning in Chanchamayo. ADEX and FUNDEAGRO should work together to identify the three or four areas/commodities which show the greatest prospects for success and then move into an integrated program in each area.

## II. EXPANDING RESEARCH OPPORTUNITIES

### A. BACKGROUND

This activity was included in the project to increase the amount and quality of research that was being done in the private sector and the university community. The project designers stated that,

"...because of the lack of research opportunities, university faculty members and their students tend to be isolated from the practical problems of Peruvian agriculture and ... that teaching content tends to be sterile and not responsive to Peruvian agricultural conditions." To address these problems, a research grants fund was established in FUNDEAGRO and funds were provided for a research program at the National Agrarian University.

The program in FUNDEAGRO became known as GREPI from the initials of the Grupo de Evaluacion de Propuestas de Investigacion which was set up by FUNDEAGRO to review incoming research proposals. The original GREPI was composed of four representatives selected from the scientific community, and one representative each from FUNDEAGRO, USAID/Peru, and NCSU. This compostion was changed in January 1991 to provide for representation from each organization participating in the ATT Project, i.e. INIAA, ONA, UNA and FUNDEAGRO as well as two representatives from the university community and one each from USAID/Peru and NCSU.

To get the program off the ground, FUNDEAGRO organized five regional seminars in the different ecological zones of the country in 1988 and 1989. Researchers, producers and public sector officials participated in the meetings to determine agricultural research priorities in each of the regions. These meetings were followed by a series of five workshops in research project preparation. The regional priority setting meetings and project preparation workshops served to inform potential participants of the existence of the program. The FUNDEAGRO GREPI staff, which consisted of a program director and two advisors, travelled extensively through the country, promoting the existence of the program. As a result, FUNDEAGRO received over 800 research proposals which were reviewed in 31 sessions of the GREPI. 205 projects were approved of which 172 received funding. As of the end of the first quarter of 1993, 112 projects had been completed and 60 were still in process. The last GREPI meetings were held in November/December, 1992 to allow completion of the projects before the project termination date of August 31, 1992.

Of the 172 funded projects, 133 projects were with universities including 71 with UNA staff, and 16 were with INIA staff, with the remaining 23 projects spread among private sector research stations and firms.

The start-up of the UNA research program was delayed two years because of disagreements between UNA leadership and the ATT Project. UNA actually started the program in early 1990. A seminar/workshop was held in early 1990 to establish research priorities in the four areas approved for research in UNA, i.e., agricultural mechanization, irrigation, drainage and soil and water conservation and management, farm management, and marketing and transport economics. These areas were chosen for emphasis because they were considered important and because they were not being researched by INIA. Because of the late start and the delays in receiving funds, most of the UNA research projects are not yet finished. Projects have been approved as follows: ten projects in farm management and marketing and transport economics, eight projects in irrigation and drainage, and nine projects in agricultural mechanization.

## B. END OF PROJECT STATUS

a. Condition Expected: "Mechanisms are identified, tested and replicated by private sector actors that increase activities of the private sector in identification, adaptation and dissemination of improved agricultural technologies, and private sector role is increasing both in absolute terms and proportionally to the public sector role."

Current Status: The FUNDEAGRO GREPI program and the UNA research grants program represent two mechanisms that increase private sector activities in the identification and adaptation of technologies that have been identified and tested under the TTA project. These particular mechanisms have been less successful in the dissemination of technologies. There is a good chance that this experience will be replicated when IDB introduces a fund to support private and public sector research and extension under its proposed new Agricultural Sector Loan.

## C. CONCLUSIONS

a. The FUNDEAGRO research grants program was successful in reaching a wide range of researchers in the public and private sectors. In fact, this was one of its major weaknesses. The program recipients were so dispersed, both in subject matter and location, that it is difficult to see that the program had any significant impact. There were attempts to narrow the focus of the program through the regional workshops and then through restricting grants to activities dealing with agricultural products for export. These steps helped, but the program was still too broad. The recipients were generally enthusiastic about the program and asked that it be continued. It provided for a much larger number of faculty and students to engage in research than had been possible previously.

The research appeared to be well-structured, with helpful advisory inputs from the GREPI. Unfortunately, there was not sufficient time nor funding allowed to pursue validation of the initial research findings. Also, there was very limited diffusion of the research results.

b. The UNA research grants program was more focussed, on the four priority areas detailed above. The funds were slow in reaching UNA which caused disruptions and slower implementation of the research. UNA staff were supportive of the program although critical of the slowness of disbursements. The research appeared to be well structured and to address important problems. There was some feeling among the research directors that they should have made a greater effort to identify potential users and to involve them in the research.

c. The two programs represent an important innovation that should be continued. The national and local universities and private research organizations and firms represent important resources in a national agricultural technology generation and transfer system.

## D. RECOMMENDATIONS

a. The experience with both GREPI and the UNA research grants program should be written up by FUNDEAGRO and UNA and made available to the designers of the IDB research/extension grants/loans programs so that they can take advantage of the lessons learned under these two activities. Consideration should also be given to channeling a significant amount of the IDB fund through FUNDEAGRO and UNA so that the program can get off to a rapid start, using the personnel and experience gained under the earlier ATT funded programs.

b. Care should be taken under the IDB project to focus the research in critical areas, to look for complementarities and networking of research in those areas and to allow sufficient time and funds to validate research results and provide for their diffusion to potential users. An effort should be made to assure that the research is addressing important problems as perceived by producers and agro-industry, i.e., that it is demand rather than supply driven. One way to assure this is to require that the research be endorsed, or better yet, undertaken as a collaborative effort with the future users of the

research results.

## AGRICULTURAL TECHNOLOGY TRANSFER AND EXTENSION

### I. QUALITY, QUANTITY AND USE OF INFORMATION AND DATA

The TTA Project has produced a tremendous volume of printed technology transfer materials, including leaflets, bulletins, magazines, and reports. The quality of the information, data and recommendations seems to be good.

Although the information generated by INIA and the materials produced have been useful, the priorities of technology transfer efforts, types of information available and methods of dissemination are all cause for some concern. Far too much emphasis has been placed on the introduction of new crop varieties, while relatively little information or technology was generated or transferred relative to managing irrigation water, addressing soil salinity problems, economic analysis, safe use of chemicals, profitability, the benefits of the application of technology, marketing and post harvest products handling, agro-industrial processing, and many other elements of the production and marketing "chain" or system. While the project has made significant contributions, technology transfer has been somewhat random and lacking in focus on major, high priority problems in a production and marketing system for targeted crops and enterprises.

The need for other kinds of information is evident when talking with producers. During the evaluation, 40 producers in the Piura and La Libertad were interviewed. Two-thirds in Piura and 50% in La Libertad said they needed more information or technology for harvesting and post harvest handling/storage. In Piura 41% said that lack of technology in using chemical was a major problem and 24% said it was a medium level problem. In La Libertad 25% said lack of technology in the use of chemicals was a major problem while 50% said it was a medium level problem. The cost of credit was listed as a major problem relative to use of other technology by 83% of those interviewed in Piura and 63% in La Libertad.

In visits to wholesale village markets, community retail markets, and city supermarkets it is obvious that marketing, including harvesting and post harvesting handling technology is lacking throughout the country.

Implementing agencies within the project have used many means and media to transfer technology, including on farm field trials and field days, leaflets, bulletins, magazines, newspaper, radio, TV, courses and seminaries, but their efforts have not reach many people in a problem solving manner, and have tended to be expensive for what was achieved. They did not make good use of inputs dealers, banks, cooperatives, associations, and producers organizations, local Universities, or agro-industries where they exist.

The Rural Women's Project was active, but the methods used to transfer technology were unnatural, high cost and reached very few people. For example, the Centro de Divulgación de Tecnología CDT in Trujillo, held a training course for women in Trujillo, for which they brought 38 rural women in rented vehicles, to attend a course held in a rented building, taught by contracted specialists.

The Rural Women's component of the project also seems to lack priority selection of both target groups and of subject matter. TTA activities for rural women included jelly making, raising small animals (Cuyes, rabbits), beekeeping, and compost/earthworm production. Many women are basic

agricultural producers, and need "normal" agricultural technology. More technology would be transferred by including women on the boards of directors of the producers Committees, and promoting and helping women to become active in farm business activities such as record keeping, accounting, management, marketing, etc.

Recommendations

1. Discontinue support to the CDTs

2. Adopt a new strategy for widespread transfer of technology as described in the Future Directions section of this report (attached to the Executive Summary).

## II. TECHNOLOGY TRANSFER SPECIALISTS AND PRIVATE SECTOR INVOLVEMENT

During the project, fifty five people received training to transfer technology within the CDT/ONA program. Only three of these specialists remain at present, and they are now working for INIA along with 30 other extension specialist in INIA. Twenty two are based in INIA-Lima, one each in Piura, Chiclayo, Trujillo, Chincha, San Camilo and 6 in Sierra and the Selva. Only eight are actually working in technology transfer. The other 22 are doing research.

The rapid turn over of personnel has been a major problem in the project in attempting to implement the transfer of technology strategy. A shortage of technology transfer personnel and a low level of transfer of technology skills are general results.

While working under an inadequate strategy, INIA researchers, UNALM's faculty and senior level students, ONA, FUNDEAGRO specialists, and at least two of the technology transfer firms have done a fair job of transferring technology that has been generated, but to a rather limited number of individuals and organizations in the agricultural sector.

Recommendation

Significant changes are needed in the strategy for mobilizing transfer of technology.

The new strategy should transfer technology in a natural day to day manner, involving existing organizations such as universities, foundations, farm supply firms, agro-industry, bankers, and marketing firms.

The range of information available for transfer should be broadened from mostly Agronomic to include water manegement, economics, cost of productions, safe/proper use of chemicals, harvesting, post harvest handling, marketing, agribusiness, and other important elements of the production and marketing system.

## III. ONA FARM RECORDS AND ANALYSIS PROGRAM

In late 1989 and early 1990 ONA designed the forms for a farm records and analysis program. The plan was to provide a records and analysis service to farmers for a fee. Between mid 1990 and August, 1991 ONA staff and contracted personnel worked with approximately 200 farmers, collecting farm business data. Of the 200, only 140 were complete enough to make an adequate analysis.

Between August, 1991 and March, 1992 the data for the 140 sets of farm records were entered into ONA computers for analysis. Between March 1992 and December 31, 1992 ONA technicians took about 30 of the analyses back to the farmers to discuss them and to try to sell subscriptions to the service. None of the farmers subscribed to the service. There seem to be three main reasons for the lack of success.

1. The small farmers ONA was working with do not keep receipts, do not keep records, have little appreciation of records and almost no understanding of analysis.

2. The records and analysis system used was too complicated to initiate such an educational service with this farm clientele group.

3. The time frame for doing the work was too long, reaching from data collection in 1990 - 1991, to presentation of results/analysis in mid- to late- 1992.

ONA's Cost of Production program, begun in 1991, now collects data for 54 crops. The cost of production analysis could be described as average costs of production for specific crops in specific areas.

Each year the cost analyses are up-dated and evaluated to note changes. Various uses are made of the data. Cost analyses are discussed with selected members of the appropriate production Committees. Month radio programs and newspaper articlesare prepared using the data, which are used by the media without charge for space or time. In addition, a monthly 2 page cost of production analysis is sold by ONA for New Soles $2 each. About 100 copies per month are sold.

Recommendation

The ONA Farm Records and Analysis program should be discontinued in its current form. An educational program to teach producers the value of record keeping and simple analysis could be of great value to emerging and existing commercial producers, with a simple records analysis service offered when record keeping begins to gain followers. Subsistence level producers seldom appreciate the value of records.

The ONA Cost of Production work should continue and possibly should be expanded to include farm level prices, wholesale prices, Community/Village retail prices, as well as super market prices. Simple analyses and summations of this data should be sent to major public and private agencies in the aricultural sector and should continue to be used in programming for Radio, Television and Newspaper.

## IV. SEED PROGRAM

The seed program assisted by FUNDEAGRO is one of the most successful components of the ATT project. The eight CODESE's, two of them with seed processing plants, seem to have gotten off to a good start and certainly are one of the best transfer of technology efforts in the project. The purchase and planting of improved and/or certified seed is one of the most natural forms of technology transfer available.

The CODESE's, although off to a good start, are not without problems. They need to significantly increase their volumes of seed certification in order to become a self-sufficient economically.

This may be difficult to do, especially in areas where traditional crop production such as rice may gradually disappear and be replaced by export crops such as asparagus, fruits and other vegetables.

The tables on following pages give a summary of the activities at 7 of the 8 CODESE locations. Data was not accessible for Tarapoto.

Recommendation

- Continue to provide assistance and support to allow the CODESEs time to develop sustainability.

- Monitor each location to determine their individual ability to survive.

- Keep an open mind relative to possibly discontinuing support if a CODESE is not going to become self-sufficient. At the same time, consider organizing additional CODESE's if needed in different locations.

- Closely monitor the seed processing plants in Arequipa and Tarapoto. If they become financially strong, they could possibly serve as models for plants in other locations.

- The CODESEs should make every effort to reduce their costs of operation. For example: the CODESE in Piura should be possibly be moved to the Chira station, and the Chiclayo CODESE to Vista Florida station.
  These moves should result in reduced costs, as well as increased volume and effectiveness.

## V. FUTURE DIRECTIONS–TRANSFER OF TECHONOLOGY, EXTENSION, SECTOR DEVELOPMENT

The base that has been established by the Agricultural Technology Transformation Project is useful. Some significant modifications, however, can improve the effectiveness and efficiency of the widespread transfer and application of appropriate technology throughout the sector.

Successful generation, verification, management, interpretation, analysis, transfer and application of technology requires the involvement of many people, services and functions. Each activity and function within the technology "chain" requires a high level of technical skills. A major current weakness is that agricultural agencies try to perform multiple functions (research, verification, technology transfer), but lack the specialized skills and resources to do them all well.

A special effort should be made to define the appropriate role for each of the key agricultural/agro-industry organizations and to help them gain the knowledge and skills required to successfully perform their designated function in the technology transfer chain.
Some suggested functions and roles for the future are briefly discussed below for various agencies and groups.

### A. INTERNATIONAL SOURCES OF INFORMATION/TECHNOLOGY/DATA

International sources of information and data are critical in providing required technology in the Peruvian agricultural sector. Increased emphasis should be placed on obtaining available technological information and data from international sources. The thrust to link up with international information sources should continue to include agronomic information from sources such as CIMMYT, CIAT,

## CODESE PIURA

| AÑOS<br>CULTIVOS | Categoría de Semillas | Has. Certificada | TM Certificada | No. Has. Sembradas con Semilla Certificada |
|---|---|---|---|---|
| **1991** | | | | |
| Algodón | Básica | 5.5 | 4.0 | 66 |
| | Registrada | 114.0 | 89.0 | 1483 |
| | Certificada | 1330.0 | 1040.0 | 17.333 |
| Arroz | Registrada | 20.0 | 131.0 | 1.637 |
| | Certificada | 210.0 | 1377.0 | 17.212 |
| **1992** | | | | |
| Algodón | Básica | 7.0 | 1.5 | 25 |
| | Registrada | 133.0 | 29.0 | 483 |
| | Certificada | 1220.0 | 163.0 | 4383 |
| Arroz | Básica | 0.5 | 3.0 | 37 |
| | Registrada | 28.0 | 55.0 | 687 |
| | Certificada | 284.0 | 561.3 | 7.016 |
| Maíz Amarillo Duro | Certificada | 2.0 | - | - |
| Papa | Registrada | 0.5 | - | - |
| Trigo | Registrada | 0.5 | - | - |
| **1993** | | | * | * |
| Algodón | Básica | 25.0 | 24 0 | 400 |
| | Registrada | 49.0 | 45.0 | 750 |
| | Certificada | 985.0 | 850.0 | 14166 |
| Arroz | Básica | 1.0 | 4.0 | 50 |
| | Registrada | 17.0 | 70.0 | 875 |
| | Certificada | 112.0 | 670.0 | 8375 |
| Maíz | Certificada | 4.5 | 18.0 | 710 |

* Estimados

BEST AVAILABLE DOCUMENT

## CODESE LAMBAYEQUE

| AÑOS<br>CULTIVOS | Categoría de Semillas | Has. Certificada | TM Certificada | No. Has. Sembradas con Semilla Certificada |
|---|---|---|---|---|
| **1990-1991** | | | | |
| Algodón | Certificada | 98.00 | 19.00 | 316 |
| Arroz | Básica | 5.00 | 25.00 | 312 |
| | Registrada | 30.00 | 150.00 | 1875 |
| | Certificada | 245.00 | 1086.00 | 13575 |
| Maíz | Básica | 1.00 | 1.30 | 52 |
| | Certificada | 12.00 | 37.50 | 1500 |
| | Autorizada | 13.00 | 43.80 | 1752 |
| **1991-1992** | | | | |
| Algodón | Certificada | 74.00 | 39.00 | 650 |
| Arroz | Básica | 6.00 | 26.00 | 325 |
| | Registrada | 20.00 | 86.00 | 1075 |
| | Certificada | 208.00 | 854.00 | 10675 |
| Maíz | Certificada | 5.00 | 14.00 | 560 |
| **1992-1993** | | | | |
| Algodón | Básica | 10.50 | 10.00 | 166 |
| | Certificada | 102.00 | 100.00 | 1666 |
| Arroz | Básica | 3.00 | 12.00 | 150 |
| | Registrada | 11.00 | 77.00 | 962 |
| | Certificada | 208.00 | 1156.00 | 14450 |
| Maíz | Básica | 1.50 | 6.00 | 240 |
| | Registrada | 4.00 | 16.00 | 640 |
| | Certificada | 110.50 | 429.00 | 17160 |
| | Autorizada | 20.00 | 72.00 | 2880 |
| Leguminosas de Grano | Básica | 12.00 | 13.00 | 216 |
| | Certificada | 82.00 | 81.00 | 1350 |
| Trigo | Certificada | 3.00 | 9.00 | 60 |

* Estimados

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## CORESE LA LIBERTAD

| AÑOS<br>CULTIVOS | Categoría de Semillas | Has. Certificada | TM Certificada | No. Has. Sembradas con Semilla Certificada |
|---|---|---|---|---|
| **1991** | | | | |
| Arroz | Certificada | 200.0 | 857.0 | 10712 |
| **1992** | | | | |
| Arroz | Certificada | 27.0 | 150.0 | 1875 |
| Trigo | Certificada | 25.0 | 105.0 | 700 |
| Papa | Certificada | 2.0 | 2.0 | 1 |
| **1993** | | | | |
| Arroz | Certificada | 102.0 | 650.0 | 8125 |
| Papa | Certificada | 21.0 | 168.0 | 67 |
| Maíz | Certificada | 16.0 | 75.0 | 300 |
| Trigo | Certificada | 48.0 | 187.0 | 1246 |

* Estimados

BEST AVAILABLE DOCUMENT

**CODESE LIMA**

| AÑOS<br>CULTIVOS | Categoría de Semillas | Has. Certificada | TM Certificada | No. Has. Sembradas con Semilla Certificada |
|---|---|---|---|---|
| **1991-1992** | | | | |
| Algodón | Básica<br>Registrada<br>Certificada | 20.0<br>200.0<br>1699.0 | 18.0<br>92.0<br>679.0 | 300<br>1533<br>11316 |
| **1992-1993** | | | | |
| Algodón | Básica<br>Registrada<br>Certificada | 17.6<br>214.0<br>1091.4 | 20.2<br>246.1<br>1255.1 | 335<br>4101<br>20918 |
| Maíz Híbrido | Autorizada | 31.0 | 89.9 | 3596 |
| Maíz Variedad | Certificada | 21.0 | 59.75 | 2380 |
| Arveja | Certificada | 7.0 | -- | -- |
| Vainita | Certificada | 6.0 | -- | -- |

• Estimados

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**CODESE ICA**

| AÑOS<br>CULTIVOS | Categoria de Semillas | Has. Certificada | TM Certificada | No. Has. Sembradas con Semilla Certificada |
|---|---|---|---|---|
| 1990-1991 | | | | |
| Algodón | Básica | 30.0 | 12.2 | 203 |
| | Registrada | 350.0 | 143.1 | 2385 |
| | Certificada | 2299.0 | 939.9 | 15665 |
| 1991-1992 | | | | |
| Algodón | Basica | 25.0 | 17.5 | 291 |
| | Registrada | 380.0 | 200.0 | 3333 |
| | Certificada | 1911.0 | 331.6 | 5526 |
| Maiz | Autorizada | 134.5 | 484.2 | 19368 |
| Pallar | Básica | 3.0 | 1.5 | 25 |
| | Certificada | 23.3 | 8.0 | 133 |
| Frijol | Básica | 2.0 | 2.5 | 42 |
| | Certificada | 14.7 | 7.7 | 128 |
| Arveja | Certificada | 4.0 | 2.5 | 42 |
| 1992-1993 | | | | |
| Algodón | Básica | 20.0 | 14.0 | 233 |
| | Registrada | 200.0 | 140.0 | 2333 |
| | Certificada | 763.7 | 743.0 | 12383 |
| Maiz | Autorizada | 163.7 | 573.5 | 22940 |
| Pallar | Básica | 5.0 | 9.5 | 158 |
| | Certificada | 18.4 | 34.9 | 581 |
| Frijol | Básica | 2.0 | 2.5 | 41 |
| | Certificada | 8.5 | 8.5 | 142 |
| Trigo | Certificada | 5.0 | 15.0 | 100 |

* Estimados

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## CORDESA AREQUIPA

| AÑOS<br>CULTIVOS | Categoría de Semillas | Has. Certificada | TM Certificada | No. Has. Sembradas con Semilla Certificada |
|---|---|---|---|---|
| 1990-1991 | | | | |
| Arroz | Certificada | 69.5 | 140.0 | 1750 |
| Papa | Certificada | 7.0 | 5 | 2 |
| Trigo | Registrada | 1.3 | 4 | 26 |
| 1991-1992 | | | | |
| Arroz | Registrada | 4.0 | 320 | 400 |
| | Certificada | 51.3 | 442 | 5535 |
| | Común | 5.0 | 40 | 500 |
| Avena | Registrada | 3.0 | 7 | 50 |
| Frijol | Registrada | 1.0 | 1 | 19 |
| Papa | Certificada | 7.0 | 5 | 2 |
| Trigo | Registrada | 1.3 | 4 | 26 |
| 1992-1993 | | | | |
| Arroz | Registrada | 4.0 | 37 | 468 |
| | Certificada | 131.2 | 886 | 11080 |
| Avena | Autorizada | 0.9 | 3 | 20 |

* Estimados

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COMITE SUB REGIONAL DE SEMILLAS - CUSCO

SEMILLEROS EN PROCESO DE CERTIFICACION Y ESTIMADO DE PRODUCCION DE SEMILLA E INGRESOS

CAMPAÑA : 1992-1993

| CULTIVO | BASICA | | REGISTRADA | | CERTIFICADA | | AUTORIZADA | | TOTAL | | % | S/ . |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HAS | TM | HAS | TM | HAS | TM | HAS | TM | HAS | TM | | |
| PAPA | 32.8 | 328.0 | 9,2 | 73.6 | 145.0 | 1,450 | 2.5 | 20.0 | 189.5 | 1,871.6 | 2 | 35,560 |
| MAIZ | 4.0 | 6.0 | -- | -- | 16.5 | 29.7 | 4.5 | 8.1 | 25.0 | 43.8 | 2 | 876 |
| TRIGO | 3.8 | 13.3 | 5.5 | 16.5 | 2.2 | 5.7 | 2.0 | 6.0 | 13.5 | 41.5 | 2 | 830 |
| HABA | -- | -- | -- | -- | 7.0 | 4.2 | 1.0 | 0.6 | 8.0 | 4.8 | 3 | 144 |
| CEBADA | 2.0 | 4.0 | 1.5 | 3.0 | 2,0 | 4.0 | -- | -- | 5.5 | 11.0 | 2 | 176 |
| FRIJOL | 1.0 | 0,5 | -- | -- | 1.0 | 0.5 | -- | -- | 2.0 | 1.0 | 3 | 20 |
| QUINUA | 1.0 | 0.5 | -- | -- | 1.0p | 0.5 | -- | -- | 2.0 | 1.0 | 2 | 20 |
| TOTAL | 44.6 | 352.3 | 16.2 | 93.1 | 174.7 | 1,494.6 | 10.0 | 34.7 | 245.5 | 1,974.7 | -- | 37,626 |



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| No. Has. Sembradas con Ma Certificada |
|---|
| 1750 |
| 2 |
| 635 |
| 500 |
| 50 |
| 19 |
| 2 |
| 28 |
| 468 |
| 0 |
| 2 |

COMITE SUB REGIONAL DE SEMILLAS - CUSCO

SEMILLEROS EN PROCESO DE CERTIFICACION Y ESTIMADO DE PRODUCCION DE SEMILLAS E INGRESOS

CAMPAÑA : 1991-1992

| CULTIVO | BASICA | | REGISTRADA | | CERTIFICADA | | AUTORIZADA | | TOTAL | | | S/. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | HAS | TM | HAS | TM | HAS | TM | HAS | TM | HAS | TM | | |
| PAPA | 23.4 | 187.2 | 1.6 | 12.8 | 21.2 | 212.0 | 4.0 | 32 | 50.2 | 444.0 | 2 | 4,440.0 |
| MAIZ | 3.4 | 2,4 | 9.0 | 13.5 | -- | -- | -- | -- | 12.4 | 15.9 | 2 | 254.4 |
| FRIJOL | 1.0 | 0.5 | -- | -- | 13.0 | 6.5 | -- | -- | 14.0 | 7.0 | 3 | 168.0 |
| TRIGO | 5.8 | 11.6 | -- | -- | -- | -- | 1.00 | 2.0 | 6.8 | 13.6 | 2 | 163.2 |
| HABA | -- | -- | -- | -- | 7.5 | 6.0 | -- | -- | 7.5 | 6.0 | 3 | 108.0 |
| AVENA | 1.0 | 1,5 | -- | -- | -- | -- | 1.0 | 1.0 | 2.0 | 2.5 | 2 | 30.0 |
| QUINUA | 0.5 | 0.5 | -- | -- | -- | -- | -- | -- | 0.5 | 0.5 | 2 | 8.0 |
| CEBADA | --- | -- | -- | -- | -- | -- | 0.8 | 1,6 | 0.8 | 1.6 | 2 | 19.2 |
| TOTAL | 35.1 | 203.7 | 10.6 | 26.3 | 49.2 | 224.5 | 6.8 | 36.6 | 94.2 | 491.1 | - | 5,182.8 |

Comité Sub Regional de Semillas Cusco
Cusco - Cusco



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CATIE, IRRI, etc., but should also include sources such as the Post Harvest Center in Moscow, Idaho; private agro-industries; universities; national agriculture libraries; and marketing information services.

The principle links with foreign information sources within the Peruvian transfer of technology "chain" will probably be INIA-Ministry of Agriculture, UNALM and local universities including the National Agricultural Library at UNALM, and FUNDEAGRO/Fundación Peru in the private production-marketing system. These key agricultural organizations will use, and should transfer, the information obtained from international sources throughout the agricultural, agro-industrial, agribusiness sector and into local university libraries and information centers.

## B. MINISTRY OF AGRICULTURE

The role of the Ministry of Agriculture in the technology transfer "chain" is vital. The policies and regulations set forth by the GOP can have a strong influence on establishing an attractive investment environment. If the investment environment is attractive, producers, agri-businesses, and agro-industries will invest, purchase improved seeds, fertilizers, irrigation equipment, and other inputs, and will acquire and apply modern technology in the process.

It would be a great help if the Ministry could assist in improving the availability of short term production credit and longer term investment credit (for establishing tree crop plantations, agro-industry processing plants, etc.), in the agricultural sector. Available, affordable credit is a great stimulant to the mass application of technology, once that technology is available.

## C. INIA

INIA's research role in the future should be limited to conducting basic, high priority research and basic laboratory services. INIA has indicated that they will be working in the following locations in the future:

| | | |
|---|---|---|
| ▲ | HUARAL | (Costa) |
| ▲ | BAÑOS DEL INCA | (Sierra - Cajamarca) |
| ▲ | ANDENES | (Sierra - Cusco) |
| ▲ | ILLPA | (Sierra - Puno) |
| ▲ | SAN ROQUE | (Selva - Iquitos) |
| ▲ | DORADO | |
| ▲ | MUYUY | |
| ▲ | EL PORVENIR | (Selva - Tarapoto) |
| ▲ | PUCALLPA | (Selva - Pucallpa) |
| ▲ | YURIMAGUAS * | (Selva) |

* Could be a specialized substation.

Eight research stations on the coast are in the process of being transferred to private sector groups for management. During the period of transition from INIA control to private sector control, INIA will need to continue to provide some services to those stations.

INIA's primary functions in the technology transfer chain should be:

1. Conduct basic research

2. Provide basic services (priority plant breeding, maintaining seed/germ plasm bank, priority laboratory services, etc.)

3. Conduct off station tests to verify/validate research results, although this should not be an exclusive INIA function.

4. Transfer their research results and recommendations to private foundations, universities, cooperatives, agribusinesses, agro-industries, ADEX, and FUNDEAGRO/Fundación Peru in the form of documents, training courses, seminars, field days, radio programs, television programs, newspaper articles, etc. While INIA has a critical role in preparing developed technology for transfer, the mass dissemination and technology transfer should not be done by INIA.

## D. UNIVERSIDAD NACIONAL AGRARIA LA MOLINA (UNALM) AND OTHER LOCAL/REGIONAL UNIVERSITIES IN PERU

University faculties of agriculture, economics, business administration, industry, communications, etc., can play major roles in achieving widespread diffusion of improved technologies. Faculty members and upper level students at the UNALM and local universities are eager to participate in the transfer of technology in their communities. They can assist in conducting on-farm trials of new crop production practices, test trial marketing technologies, assist in agro-industry technology development, assist service agribusinesses such as inputs dealers and bankers to obtain appropriate technology useful to their businesses and clients.

Faculty members and students do not need salary payments. They need some funds for supplies, materials, and transportation to support their work in the transfer of technology, but their involvement can be highly cost effective. The vice-rectors, deans and other university faculty members visited all agreed that an involvement of their faculties and upper level students would not only help the producers, agribusinesses, agro-industries, and foundations in their communities, but would also help the students and the universities by providing an opportunity for practical experiences and closer contact with agricultural sector problems and opportunities in their communities. The rectors and deans also said that involving students and faculty members would strengthen classroom studies.

In the process of involving UNALM and local universities, another high priority activity should be to upgrade the various uiversity libraries to include the latest on-line capabilities for accessing appropriate technologies and other methods of establishing and maintaining a dynamic technical reference information-data base appropriate to their local agricultural sector development needs.

The following universities were indicated as capable and interested in involving faculty members and students in the generation and transfer of technology. A few could be selected to form a core group for initial involvement in a test of the cost effectiveness of their involvement in a technology transfer effort.

### PUBLIC UNIVERSITIES

### UNIVERSIDAD NACIONAL AGRARIA DE LA SELVA - TINGO MARIA

UNIVERSIDAD NACIONAL AGRARIA LA MOLINA - UNALM
UNIVERSIDAD NACIONAL DANIEL ALCIDES CARRION - PASCO
UNIVERSIDAD NACIONAL DE CAJAMARCA
UNIVERSIDAD NACIONAL DE LA AMAZONIA PERUANA - IQUITOS
UNIVERSIDAD NACIONAL DE PIURA
UNIVERSIDAD NACIONAL DE SAN MARTIN - TARAPOTO
UNIVERSIDAD NACIONAL DE TUMBES
UNIVERSIDAD NACIONAL DE UCAYALI - PUCALLPA
UNIVERSIDAD NACIONAL DEL ALTIPLANO - PUNO
UNIVERSIDAD NACIONAL DEL CENTRO - HUANCAYO
UNIVERSIDAD NACIONAL DEL SANTA - CHIMBOTE
UNIVERSIDAD NACIONAL HERMILIO VALDIZAN - HUANUCO
UNIVERSIDAD NACIONAL JORGE BASADRE - TACNA
UNIVERSIDAD NACIONAL PEDRO RUIZ GALLO - LAMBAYEQUE
UNIVERSIDAD NACIONAL SANTIAGO ANTUNEZ DE MAYOLO - HUARAZ
UNIVERSIDAD NACIONAL SAN AGUSTIN - AREQUIPA
UNIVERSIDAD NACIONAL SAN ANTONIO ABAD - CUSCO
UNIVERSIDAD NACIONAL SAN CRISTOBAL DE HUAMANGA - AYACUCHO
UNIVERSIDAD NACIONAL SAN LUIS GONZAGA - ICA

PRIVATE UNIVERSITIES WITH AGRONOMY PROGRAMS

UNIVERSIDAD ANDINA NESTOR CACERES VELASQUEZ - PUNO
UNIVERSIDAD PARTICULAR DE APURIMAC - APURIMAC
UNIVERSIDAD DE HUANUCO - HUANUCO
UNIVERSIDAD PARTICULAR UNION INCAICA - LIMA
UNIVERSIDAD CATOLICA DE AREQUIPA - AREQUIPA

A pilot effort involving a few local Universities plus UNALM could be tried, and expanded if successful. Any such effort should be tied closely to an ADEX/FUNDEAGRO/Fundación Peru program to promote increased agricultural exports. Faculty members and upper level students/graduate students of those universities could be mobilized to assist in transfer of technology with limited funds from such a program.

University officials visited estimated that at least 25 universities in the country could offer an average of 5 interested faculty members in each of the 5 or 6 departments, or about 25 faculty members per university. A total of over 500 professors could be available and willing to work on technology transfer, and possibly technology generation in economics, marketing, and other relevant topics. They further estimated that each professor could provide about 5 appropriate upper level students, for a total of about 2,500 upper level students each year, who need practical, hands-on experience. These students would be anxious to work in agriculture, agro-industry, agribusinesses, marketing, nutrition, communications, etc. at minimum cost, if the pilot efforts demonstrated the cost effectiveness of such an approach. Through this same involvement, the faculties would be more practically based in field experience, and teaching more modern technologies in their class instruction. The university libraries would gradually be up-graded to meet the demand for technical information in their specific communities by the students and faculties involved.

The total numbers can be exciting, but the cost effectiveness of the approach should be tested

carefully. It is suggested that a pilot effort be considered, if funding is available from the export promotion, BID, or other program, with possibly 5 local universities plus UNALM, mobilizing about 5 professors in each university and about 5 students per professor, or about 30 professors and 150 students.

Mobilizing the involvement of the universities would tap a capable, although possibly somewhat dated knowledge base. Their involvement will establish a local technical "army" to identify and seek solutions to problems, and to identify and seek ways to capitalize on opportunities in their communities. They are familiar with their area, they know their people and are known by them, and they can most easily recognize and identify with their problems. They seem to be anxious to get involved in the development efforts most directed to their communities. Students will offer the enthusiasm of youth, new ideas, and eagerness to try new things, and faculty members can help guide that excitement and creativity as constructive elements in the technology transfer system.

The UNALM is probably in the best position to mobilize and be the technical coordinator of the involvement of the local universities. They should specify definite, targeted clientele to receive technology from the universities involved, such as; area producers to cooperate in on-farm field trials of specific crops, priority agro-industries, farm store input dealers, banks, marketing firms, youth and women's programs, and other similar receivers. They may also need to provide some training at the start, to get local universities started in the right direction. They must provide that guidance with tact and sensitivity in order to direct the enthusiasm of the university faculty members and students in a supportive rather than a controlling manner.

## E. NATIONAL AGRICULTURE LIBRARY AND OTHER UNIVERSITY LIBRARIES

Having easy access to information and technology is a necessity in developing a successful system to obtain widespread application of technology. Research results and information about appropriate technology is too often known only to a few researchers and others who have the information in their heads, their desks, or files, but do not make it available to others. The National Agricultural Library at La Molina, and libraries at the regional universities can improve the system of obtaining and diffusing information and technology from both outside international sources and key information and technology generating organizations within the country.

As Perú moves forward to modernize the agricultural and agro-industry sectors, there will be major shifts in production areas (e.g. rice production gradually moving from the coast to the selva). Traditional crops will gradually give way to more intensive, high value, export crops. More emphasis will be placed on agro-industrial food, feed and fiber processing which add value and create employment, generate more incomes and develop the investment base of communities.

These changes will demand new, improved ways of obtaining, verifying, validating, adapting, transfering and using technology, information and data, because competitive markets both demand and reward the use of good technology, information, and data. The generation, collection, management, verification, interpretation, analysis and transfer of technology within the agricultural agro-industrial sector must become much more dynamic, with more systematic transfer linkages among the various areas of the country, and with other world sources.

Research and other technical information collecting activities should be principally user (demand) driven, with priority selection responding to both market demand and comparative advantage in production if the resulting technologies are to gain widespread diffusion and use within the sector.

Successful production and marketing of an agricultural product should be thought of as a system, involving many different people and services, beginning with the decision to plant a specific priority crop and continuing through the system to the ultimate consumer of the product. Similarly, information and technology should be thought of as systems of information and knowledge available to guide and assist the production and marketing systems of specific crops, practices, functions, businesses and industries.

## F. PRIVATE FOUNDATIONS

Private foundations, such as those taking over the management of the coastal research stations, can undertake fundamental functions in the technology transfer system. They can:

1. Generate information/technology though their research programs.

2. Transfer technology to their members or clients.

3. Contribute technology to the technical reference library system.

4. Purchase, sell and distribute appropriate inputs such as seed, fertilizer, and equipment, and provide recommendations for use to their clients. They are in direct day to day contact with local producers and know their problems and opportunities, therefore they play a major role in knowing what new information and technologies are needed.

## G. ONA

ONA has a role in the future technology generation and transfer system. They could promote within the producer group the use of improved harvesting and post harvest handling practices. They could help some groups and committees to arrange for joint transportation, processing, packaging or other support services. They could provide organizational contact assistance working with FUNDEAGRO to help some targeted producer committees and groups to become cooperatives or agribusinesses, such as inputs dealers, farm supply stores, or marketing firms.

ONA should continue to collect priority data at the farm/producer group level, such as cost of production, transportation availability and cost, and prices at the community, wholesale and supermarket levels. This information/data should be made available to the GOP, international organizations, university libraries and to the proposed New Agricultural Sector Analysis, Monitoring and Strategic Planning unit (see Institutional Issues section.)

## H. PRODUCER COMMITTEES/LEADING PRODUCERS

Producers, as users of technology, play a major role in the application of technology. There are over 500 producer groups and committes in Perú. Leading farmers and farmer groups can assist in the technology chain in many ways, including:

1. Providing sites for farm field trials and field days.

2. Promoting the use of improved technology within their groups.

3. Jointly buying and distributing recommended inputs, such as improved/certified seed, recommended fertilizers, etc.

4. Promoting improved harvest practices and post harvest handling and jointly purchasing and distributing produce boxes and other recommended materials or equipment

5. Leading farmers and farmer groups are the closest to their own problems, making their feed-back to those organizations generating and gathering information and technology vital in making the technology transfer system demand driven. They are key players in determining priorities.

## I. AGRIBUSINESS, BANKERS, INPUTS DISTRIBUTORS, AGRICULTURAL SUPPORT SERVICES, AGRO-INDUSTRY/PROCESSORS, AND MARKETING FIRMS

The future growth of the agricultural sector in Perú depends largely on the ability to commercialize and industrialize the sector. Agribusinesses, bankers, input dealers, agricultural support services, agro-industries such as processors, and marketing firms all have important roles in the transfer of appropriate technology. They are in day to day contact with producers. The input dealer, as one example, transfers technology by selling better seed and fertilizers, and providing the best available recommendations for their use. Marketing firms and agro-industries automatically promote improved harvest and post harvest technology if they pay more for higher quality products. The banker automatically supports the use of improved technology when he requires that it be used before approving loans.

These firms are the best link to the farmers. Every farmer deals with them on a regular basis. Agribusiness firms can transfer technology to many producers on a regular basis, as they go about their normal work. They are also a very important feed-back system to determine the priority needs of future research and information generation to support commercial agriculture and agro-industrial development.

## J. ADEX

Although ADEX is not in the TTA Project it plays a major role in the technology generation and transfer chain. It's day to day work with exporters is an important link between local exporters and foreign markets, as well as the technical elements of transportation, handling, etc. required to successfully get product from Perú to the targeted markets.

ADEX can provide the technology transfer system with important information about foreign market potentials; requirements of product size, color, quality, seasonality, packaging and handling technologies required; and a multitude of other information items regarding the foreign market demands. As ADEX provides those requirements to exporters, the exporters in turn pass on information about the requirements to the producers. This information flow directly promotes the use of improved practices/technologies.

ADEX – Fundagro → Producers.



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## HUMAN RESOURCES, AGRICULTURAL MARKETING, AND INFORMATION SYSTEMS

### I. EVALUATION OF ATT PROJECT ACTIVITIES

#### A. IMPROVEMENT OF THE TEACHING PROGRAM–UNALM

Unfortunately, UNALM, for political reasons, refused to work with the ATT project in the first few years. This affected its efforts in all the components of the project, especially its participation in the long term off shore training program. UNALM has made efforts to improve management of teaching programs for research and extension professionals principally by making heroic efforts to ensure that graduate students complete Masters theses, by providing incentives to professors to continue to do research and by introducing practical and field oriented aspects into the curriculum, thereby increasing the relevance of its curriculum to Peru's agricultural development needs. In addition, the University has broadened its information networks with overseas and other in-country organizations involved with related research and associated training programs, particularly with the Food and Agricultural Organization of the United Nations.

#### B. QUALITY AND ADEQUACY OF ACADEMIC STAFF, TEACHERS AND TRAINERS PRODUCED UNDER THE ATT PROJECT

##### B.1 UNALM

The late entry of UNALM as an institution into the project meant that the most of the foreign fellowships had already been granted to persons outside the university system. Only one person from the University received a fellowship, although several of those trained subsequently have been employed by the university. The partial scholarship program, on the other hand, has created a great spurt of effort at the end of the project to qualify students for higher level efforts in research and extension. This program has been extremely beneficial for the students involved in encouraging their individual and collective research efforts through the publication of theses. The numbers in this program are greater than all the graduate students produced in the last 20 years by the university.

##### B.2 Universidad Nacional de Piura

One of the foreign fellowship recipients (M.S.-level) came from this university and he had returned as a department head and active member of the graduate school program. The development of a new program of a Master of Science in Rural Development had been undertaken with 18 students of the first class completing their course work. Three of them had completed drafts of their theses. A new class of over twenty has been admitted for the 1993-1994 cycle.

##### B.3 Universidad Nacional del Altiplano (Puno)

Another of the foreign fellowship recipients (Ph.D-level) came from this university. He had begun the process of working with his colleagues in the university to rethink and restructure the curriculum and organization of the institution. He reported that 5 professors at Puno had Ph.D. degrees and 60 percent of the faculty had Master's degrees, a very high level of accomplishment. Five students had completed course work for the Master of Science degree program in Andean Crops. A new class of eleven has been admitted for the 1993-1994 cycle.

## C. UNALM RESEARCH, TRAINING, AND EXTENSION MATERIALS

The National Agricultural Library (NAL) seems to have been improved during the life of the project, particularly by the introduction of CD-ROM technology and by the introduction of telecommunications capabilities for international information interchange. UNALM officials told the author that most of the improvements in the library had been accomplished without the direct intervention of the ATT project. Unfortunately the holdings of the library are not very great. Nevertheless, the computerized bibliographic searching capability introduced by the CD-ROM technology has enhanced the quality of the research work done by researchers and students in terms of providing them with an up-to-date view of relatively current work being done by professional colleagues elsewhere. Factors currently limiting the use of the library's telecommunications capabilities included the lack of sufficient and clean dedicated telephone lines for networking purposes. Another factor limiting some students' use of the computerized literature searching capabilities is that students were unable to utilize citations from foreign language sources. Perhaps more emphasis should be placed in Graduate studies on learning foreign languages as a basis for conducting library and theoretical research on which to based field work and applied studies.

Representatives of UNALM suggested that some of the advances made in the information technology arena by UNALM were more a result of the efforts of the university with its own resources rather than a direct result of ATT project funding. For instance the multiuser VAX minicomputer, housed in the National Agricultural Library, was donated to the university by another donor. It was also suggested that periodicals destined for the library were either never ordered or never arrived.

## D. INTER-INSTITUTIONAL PUBLICATIONS AND TECHNICAL INFORMATION EXCHANGE

INIA has established a component to improve the modes of diffusion of technological information to scientific colleagues and the public. For example, in Puno, at the Illpa experiment station, the staff provided the team with copies of various publications funded under the ATT project including Field Day programs, a booklet on spring wheat recommendations for the Puno area, a series of 9 one page flyers on potato production, including land preparation, soil sampling, manure decomposition and storage practices, potato seed disinfection, planting recommendations, fertilization, insect control, disease control, and harvesting. In addition, more complex, technically detailed publications were also being produced such as scientific papers and bulletins, which describe work in progress, accomplishments and findings. Many of the simpler publications had also been used as a basis for fifteen minute radio programs aimed at farm households in the highlands. Staff in Puno complained that materials sent to INIA in Lima were not always received or responded to adequately. They specifically explained that the competitive program to give incentives to scientists for accomplishments and publication of their findings seemed to favor scientists in Lima, even though the programs for Andean crops were specifically adapted to highland research stations, including Illpa. Although these publications and media exist, it is unclear exactly what audience has received them and what their impact has been. However, the establishment and spread of this method of outreach seems to have become entrenched as a way of doing business in INIA, and this change is an improvement in the linkage between technology generation and producers.

## E. EFFECTIVENESS OF LOCAL AND OFF-SHORE TRAINING

### E.1 Level of Training

The graduate level M.S. and Ph.D. training activities on the whole support the activities of INIA and Peruvian universities by creating a cadre of specialized agricultural scientists. The project paper envisioned a total of 21 advanced degree off shore fellowships (equally divided between INIA and UNALM) as well as 16 off shore post-doctoral and sabbatic study fellowships. In fact, 21 off shore advanced degree fellowships were funded and no post-doctoral and sabbatic fellowships were funded under ATT. The proportion of Ph.D. degrees was lower and that of M.S. degrees was higher than originally anticipated.

Figure 1: Off-Shore Training: Level of Study

| Type | Anticipated # (%) Project Paper | | Actual # (%) | | Percent Expected |
|---|---|---|---|---|---|
| Ph.D | 13 | (62) | 9 | (43) | 69 |
| M.S. | 8 | (38) | 12 | (57) | 150 |
| Total | 21 | (100) | 21 | (100) | 100 |

In terms of the in-country training program, 200 M.S. students were to be funded under the project. According to FUNDEAGRO records, 65 full scholarships were granted under ATT, 42 of them for studies at UNALM, 18 for studies at the Universidad Nacional de Piura and 5 for studies at the Universidad National del Altiplano.

Due to the low numbers of full scholarships, a study was undertaken at UNALM to determine why students were not completing their Masters degrees. As a result, a new program of partial scholarships was proposed a year ago and it was initiated at UNALM. Under this program, students who had begun their Masters programs but had not completed their theses were identified. Their specific financial requirements for fully completing their degree requirements were specified, including any additional course work, thesis research costs, travel costs, stipends, editing, printing and binding costs, and final matriculation and graduation fees due to the university were calculated. In the first assessment, 149 students were identified as near enough to completion to allow them to graduate before the project completion date. Based on their financial requirements, the program was funded by AID through ATT. During the course of the program, 16 of them dropped out of the program. The funds reserved for those 16 were reprogrammed by UNALM allowing an additional 27 students to receive support under the program. Therefore, a total of 160 students have received support from the partial scholarship program under the ATT project. Of those, as of the end of May, 1993 according to the UNALM final report, 88 have actually received their M.S. degrees, and 33 have written and defended their theses but lack final editing, printing and binding, leaving 39 continuing to work on their degrees. The average cost per student was US $ 1137 (based on a total program cost of US$ 181,948 and 160 recipients), ranging from US$ 150 to approximately US$ 3000. On June 2, 1993, in an impressive ceremony attended by the Vice Minister of Agriculture, the Director of the USAID Mission to Peru and other dignitaries, most of these partial scholarship recipients graduates received their diplomas.

E.2 Appropriateness of Areas of Specialization of Trainees

When compared with the expectations presented in the project paper, the proportions of trainees selected in specific areas varied from the goals, regardless of whether the analysis was done on the Off-Shore Trainees or the In-Country Trainees.

Given the assessment by this evaluation team that a more comprehensive systems approach to the complete farm-to-market chain of events, the emphasis on scientific training in agronomic and production oriented areas in the project design may in fact not have been appropriate in all components, including training.

Figure 2: Off-Shore Training: Areas of Specialization

| Area of Specialization | Anticipated # (%) Project Paper | Actual # (%) | Percent Expected |
|---|---|---|---|
| Plant Sciences | 11 (52) | 6 (29) | 55 |
| Resource Management | 2 (10) | 5 (24) | 250 |
| Food Sciences | 2 (10) | 4 (19) | 200 |
| Animal Sciences | 3 (14) | 3 (14) | 100 |
| Economics | 3 (14) | 2 (10) | 67 |
| Other | 0 | 1 (4) | ++ |
| Totals | 21 (100) | 21 (100) | 100 |

Figure 3:
In-Country M.S. Full Scholarships: Areas of Specialization
(All Universities)

| Area of Specialization | Anticipated # (%) Project Paper | Actual # (%) | Percent of Expected |
|---|---|---|---|
| Plant Sciences | 30 (15) | 18 (28) | 60 |
| Resource Management | 38 (19) | 12 (18) | 32 |
| Food Sciences | 7 (3) | 1 (2) | 14 |
| Animal Sciences | 28 (14) | 8 (12) | 29 |
| Economics | 48 (24) | 12 (18) | 25 |
| Other | 49 (25) | 14 (22) | 29 |
| Totals | 200 (100) | 65 (100) | 33 |

Figure 4:
In-Country M.S. Partial Scholarships: Areas of Specialization
(First Group at UNALM)

| Area of Specialization | Anticipated # (%) Project Paper | Actual # (%) | Percent of Expected |
|---|---|---|---|
| Plant Sciences | 30 (15) | 29 (18) | 97 |
| Resource Management | 38 (19) | 41 (26) | 108 |
| Food Sciences | 7 (3) | 25 (16) | 357 |
| Animal Sciences | 28 (14) | 10 (6) | 36 |
| Economics | 48 (24) | 15 (9) | 31 |

| | | | |
|---|---|---|---|
| Other | 49 (25) | 40 (25) | 82 |
| Totals | 200 (100) | 160 (100) | 80 |

By combining the numbers for the full scholarship recipients with the partial scholarship recipients, the overall numerical goals of the project for numbers of persons trained were met. However, this is a bit deceptive, since the partial scholarship recipients had many fewer training months than the full scholarship recipients, and the overall impact of the project on each person was probably less. Nevertheless, the fact that the project encouraged and supported students in completing their thesis projects and receiving their diplomas gave an important message to the Peruvian university community: the quality and completeness of post graduate level research is important, makes a difference, and is recognized.

### E.3 Current Employment of Off-Shore Trainees, Rate of Returning Students, and Brain Drain Issues

The following charts show that the majority of off shore trainees have returned to work in Peru and are primarily working in the public sector agricultural research and state owned agricultural universities. In addition, the trainees appear to have returned to the locations from which they came, although there is a tendency for more of the highly trained individuals to come to Lima. (Most of the trainees were originally from Lima.) No tendency was demonstrated by the current employment data for trainees to leave Peru permanently due to their training.

Figure 5: Off Shore Trainees: Current Employment by Type

| Source | Number | Percentage |
|---|---|---|
| Ministry of Agriculture and INIA | 5 | 24 |
| Peruvian Universities | 6 | 29 |
| Peruvian Private Sector (including CIP) | 2 | 9 |
| Sub-total (Returnees) | 13 | 62 |
| Still in School (Not yet Returned) | 8 | 38 |
| GRAND TOTAL | 21 | 100 |

Figure 6:
Off Shore Trainees: Current Employment by Location

| Category | Number | Percentage |
|---|---|---|
| Returnees | | |
| in Lima | 6 | 29 |
| in selva locations | 3 | 14 |
| in sierra locations | 2 | 9.5 |
| in other coastal locations | 2 | 9.5 |

| | | |
|---|---|---|
| Sub-Total | 13 | 62 |
| Not yet Returned | 8 | 38 |
| GRAND TOTAL | 21 | 100 |

Of the trainees not yet returned, 7 of the 8 had established and communicated planned return dates within the next 6 to 7 months. Many of them had requested extensions of time in order to complete their courses of study.

## II. FINDINGS AND RECOMMENDATIONS

### A. OFF-SHORE FELLOWSHIPS

Findings: Recipients who have completed training are returning to Peru, to their institutions of origin. The author interviewed 5 of the 21 recipients, three in North Carolina, one in Piura and one in Puno. In addition, she obtained data from the AID Mission's training office on the current employment of all returnees. Returnees seem to be attempting to put their training to work for the good of their institutions. Working conditions in Peruvian institutions are difficult and the families of trainees have difficulty adjusting to the austere conditions of the Peruvian economy and social environment after years in other countries. Research facilities and supplies are inadequate to continue with the same kinds of investigation they pursued during their studies abroad. However, those interviewed showed enthusiasm and hope concerning making appropriate contributions to Peru's development.

Recommendations: The ATT project's off shore Ph.D. and M.S. component is complete and no further activities should be undertaken.

### B. IN-COUNTRY FULL SCHOLARSHIPS

Findings: The In-Country full scholarship program did not meet its goals. Many students who began these programs have not yet completed their degree programs. Nevertheless, it is important to recognize the contributions to practical, applied research made by in-country scholarship recipients and to encourage them to complete their research projects and contribute them to the body of knowledge to be used by others in Peru and elsewhere.

Recommendations: The kind of follow-up undertaken by Dr. José Estrada at UNALM with the Partial Scholarship program is needed for all in-country scholarship programs. Mid-project assessment may indeed provide AID and the implementing institutions with ideas for intervention in bottleneck areas and improvement in overall graduation rates and quality of thesis research products. Both Puno and Piura have admitted new classes of students to their graduate programs. Support for these students and universities is a very cost-effective way of encouraging research in areas supporting overall priorities of agricultural research and extension. If project funds remain, the author recommends that additional grants be made to the two regional universities to support students in their M.S. programs.

### C. PARTIAL SCHOLARSHIPS

Findings: The resounding success of the partial scholarship program is partly a phenomenon of

opportunity, given the back-log of incomplete theses at UNALM. Additional students there have already been identified for a continuation of this program.

Recommendations: It is recommended that some additional UNALM students be supported by remaining ATT project funds. Furthermore, it is recommended that the partial scholarship program be extended to the programs at the regional universities having graduate programs, such as Puno and Piura, with the same kind to tight management and follow-up, on a case-by-case basis to ensure student success.

## D. INSTITUTIONAL STRENGTHENING

Findings: The educational institutions supported under ATT received some funding of institutional strengthening activities. These included awards for high quality research, incentives for thesis advisers' research work, and other contributions. The institutions report that they are pleased with this support. However, the basic resource of the National Agricultural Library has not been supported as envisioned.

Recommendation: Since the NAL will serve as a basic tool for all Peruvian researchers in public ad private sectors alike, and can also be used to assist private sector institutions in accessing information needed to define comparative advantages and economic opportunities, a needs assessment for this resource must be done to ensure a sounder information basis for all agricultural sector activities.

## E. NON-GOVERNMENTAL POST-SECONDARY TEACHING INSTITUTIONS

Findings: There are a number of non-governmental post-secondary teaching institutions in Peru. Some of them are oriented toward areas which can contribute to the agricultural sector, either through collaboration with public-sector agricultural teaching institutions or through joint ventures with private sector agricultural service organizations. The Universidad de Piura is a private university with some strength in the area of business administration. Through the good offices of FUNDEAGRO, it has entered into discussions with the Universidad Nacional de Piura to attempt to define a shared activity in agro-industrial training. These discussions are in a preliminary stage, but they hold promise. The Universidad de Piura seems to have a good idea of how to analyze a market for training, assessing the potential market for short courses, night school programs for locally employed professionals, weekend programs, and more intensive day courses. The Instituto del Sur (in Arequipa) is another post-secondary institution, with a strong track record in business oriented training, which has demonstrated some interest in training for the agricultural sector. They have entered into discussions with the new managers/users of the Santa Rita experiment station on offering a multi-year agricultural technical training program at the station for persons directly involved in the agricultural production process. They prepared a rather extensive analysis of the sector and local economic conditions as a basis for the proposed joint venture. This idea also has promise, although it may require some additional attention to economic trends and opportunities, prior to defining a target training population. Valle Grande and ADEX are two other

organizations offering targeted training in certain areas at present.

## III. ISSUES

Funding of Trainees and Flow of Funds to Universities--Some additional attention may be required to make sure that funds intended for training programs are quickly and properly accounted for. Additional funding should not be provided unless the institutions handling the funds behave in a cooperative, forthcoming manner.

Selection and Targeting of Trainees--The author was unable to review the selection and targeting process for all the training programs. She was told that the long term off-shore training was advertized in newspapers for specific areas of specialization. Questions remain about how information about these programs have been and should be diffused. In addition, there is a concern that using "major fields" as a method for targeting training is a crude way to promote development.

Short Courses: Costs and Benefits--Short courses were offered by FUNDEAGRO and ONA as a part of the project. Also, participants were sent for short term training outside of Peru under the NCSU contract. The relationship between costs and benefits for these activities are not clear. FUNDEAGRO made concrete attempts to evaluate its short courses, and improved the evaluation process over time.

## PROJECT SUCCESSES

Although plagued by problems discussed at length in this report, the ATT project managed to accomplish a remarkable amount of work. While it did not reach all of the goals of the design, there were some successes worthy of note, even where they constitute only partial achievement of what was expected. Failure to mention achievements as successes does not mean they were failures. We list here some of the items we feel to be of significant importance under the circumstances of the project.

The expectation of regular interinstitutional cooperation, internalized in the operations and planning of each of the participating institutions was not fulfilled. However, the project did bring together representatives of those institutions enough that they share closer personal relationships, communications and respect. Cooperation among employees of these institutions has been going on in the field for some time on a personal basis, but the improvement achieved in cooperation at the national level is important. That such interaction is personal more than institutional is not at all surprising, and the expectation that the project could produce, actually force, institutional cooperation in the span of one five year project was undoubtedly unrealistic.

The creation of a system of Departmental Committees for Seeds, the CODESE's, was a significant success. While most of the committees still need strengthening to become economically sustainable, they are functioning and providing an important and needed service to producers.

INIA has internalized project principles in its research and technology transfer approach and methodology, and those principles are enthusiastically embraced by INIA field research staff. The exercise of those principles needs some refinement, but the attempts to involve producers in priority determination, the attempts to improve research focus, attempts to expand linkages with other research institutions both inside and outside Perú, and the interest in improving technology transfer are all integral parts of INIA's ccurrent programs.

The research grants program, while lacking adequate focus and not allowing sufficient time and funding for verification and transfer of results, was successful in involving many non-governmental researchers in technology generation. Focus can be improved by more careful selection of approved projects. Some means needs to be developed to inform potential grant applicants of the identified priorities as those become available, but the approach has proven itself an excellent means of involving a range of research capabilities not accesible in other ways.

The emphasis on agronomic research in the project design combined with the large number of research programs that were included, limited the scope of both technology generation and information prepared for transfer from the viewpoint of a complete production and marketing system. Nevertheless, a large amount of technological information was prepared for transfer by various means. One of the more valuable combinations of project impacts is the use of the CTTA methodology developed under an earlier project to prepare technogical information developed under ATT for transfer. INIA, UNALM, ONA, FUNDEAGRO, and two technology transfer firms all participated in this information processing. Much, although not all, of that preparation involved use of ATT project funds.

The Cost of Production program of ONA produces valuable information of use to commercial and emerging commercial producers. While we have recommended expansion to this data program, the

work so far constitutes a success of significant value.

One major reason that students do not finish Masters degrees in Peruvian universities is the lack of funds with which they can travel, buy materials, and perform other necessary tasks to do their research for thesis purposes. A very successful program late in the ATT project was the partial scholarship program tested at UNALM which allowed over 100 such students to finish their degree programs and graduate. A backlog of such students still remains in Perú, leading the evaluation team to recommend continuation of this program.

## LESSONS LEARNED

The design vision of the ATT project was, and remains, of undeniable value. The support and strengthening of an agricultural technology generation and transfer (ATG&T) system, begun under predecessor projects, is a priority need of Perú. Expectation of more funding than was received led designers into a trap often suffered by USAID missions on other projects: the attempt to embody in one project, so many elements over such a wide range of interventions, that it assumes program proportions and becomes almost impossible to manage as a project. Research, technology transfer, communications, training, institutional strengthening, interinstitutional cooperation, a seed certification and distribution system, and the involvement of private sector entities, including the creation of several of them, are all important parts of the creation of an ATG&T system. They involve so many special problems and considerations, however, that to include them all in one project expands its complexity beyond reasonable bounds.

Difficulties, including the availability of less than half the donated USAID funds expected, rising political insecurity in Perú, and the reappearance of traditional institutional instability began to impact the project before implementation actually began. These stress factors point out at least two other design factors which made the implementation very difficult.

For one part, the design proved to be very inflexible at that point. The Government of Perú attempted to negotiate changes early in the project to reduce the scope and scale, but was unsuccessful.

For the second part, USAID missions in countries undergoing political insecurity and instability have always had difficulty obtaining good project managers. Having designed an extremely management intensive project, and with every reason to expect a shortage of the best project managers, the mission still failed to agree to limits on the scale and scope of project activities. The mission's recognition of their project management limitations would seem to be reflected in their decision to delegate much of the financial management and administration to a local agency (FUNDEAGRO).

Project design required substantial interinstitutional cooperation, among institutions with histories of mistrust. Eventually obtaining such cooperation is, of course, necessary to a strong, functional ATG&T system. Institutional strengthening and cooperation elements in many projects have indicated that such cooperation comes only slowly, and requires constant and intense efforts to educate the institutions regarding the benefits of cooperation, the definition of specific and important roles for each institution, and the clear definition and agreement upon priorities for the joint activity. The ATT design gave each participating institution an important role, but their understanding of, and agreement upon, the overall joint goals being pursued and the benefits of cooperation was not apparent to the evaluation team in all the participating institutions. Even under ideal political and economic circumstances, the ability of the institutions to achieve enough cooperation at the institutional level to accomplish project objectives in so short a time is questionable. A good beginning in cooperation was made, and possibly that is all that the project should have expected during the first few years.

The research activities which showed the greatest results were those which were started under the predecessor REE project and continued under the ATT project. The strongly positive results of this twelve year effort underscore the team's belief that good research requires not only a clear focus, but also a commitment of sufficient size and duration to do the detailed and time consuming work necessary to

make research breakthroughs.

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IN ADDITION:

- 8 Strategy and Planning Documents of FUNDEAGRO
- 36 (Approximately) Examples of Information Sheets (Hojas Volantes) for Producers from INIA - CTTA
- 22 Technical Manuals from FUNDEAGRO
- 3 Examples of ONA Crop Magazines
- 2 Examples of UNALM Science-Technical Journal "Agronomía"
- 12 Examples of FUNDEAGRO Bi-Weekly "Revista del Agro"
- 5 Feasibility Studies of Agricultural Commercialization Projects by FONAGRO
- 1 Example of "El Exportador Peruano" from ADEX (Weekly)

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- 1 Example of INIA Quarterly "Revista del INIA"
- 27 Examples of INIA Producer Data Sheets and Folders
- 5 Examples of Information Cards from the Piura CODESE
- 17 Examples of UNALM Publications for Producers and Technology Transfer Specialist
- 1 Cassette of Radio Programs for Transfer of Technology to Producers

## APPENDICES

I. PERSONS INTERVIEWED AND CONTACTED

II a). EVALUATION SCOPE OF WORK
II b). BIOGRAPHICAL INFORMATION–EVALUATION TEAM MEMBERS

## APPENDIX 1:

## LIST OF PERSONS INTERVIEWED OR CONTACTED

**RALEIGH, NORTH CAROLINA (Dr. Charlotte Miller)**

North Carolina State University (NCSU)

Dr. Art J. Coutu, former ATT Project backstop
Dr. Thurman L. Grove, Director, International Programs, NCSU
Dr. William L. Johnson, former Acting Chief of Party, ATT Project
Dr. J. L. Apple, former Director, International Programs, NCSU
Dr. H. D. Gross, team member
Dr. Frank J. Smith, team member
Ms. Jan Holman, Administrative Assistant, International Programs
Dr. Fred Mann, former Deputy Chief of Party, ATT Project (by telephone in Guatemala)

Peruvian Scholarship Recipients at NCSU:

Ana Maria Garcia, Food Science M.S. student
Laura Reina, Food Science M.S. student
Jose Estrada, Agricultural Economics Ph.D. student

**WASHINGTON**

Agency for International Development

Joe Salvo, former Project Manager, ATT Project, USAID/Lima
Audon Trujillo, former Project Manager, ATT Project, USAID/Lima
David Bathrick, former Agricultural Development Office head, USAID/Lima

Contractors

Kerry J. Byrnes, LAC/TECH Advisor, Chemonics, Inc.
Dr. Constance McCorkle, member, Mid-term ATT evaluation team, Independent Consultant

USDA/OICD Washington D.C.

Andres Delgado, Chief, Interamerican and International Branch, USDA/OICD
Gary Smith, Original Evaluation Team Leader

**LIMA**

USAID/PERU

Mr. George Wachtenheim, Mission Director
Mr. Harry Wing, Food and Agriculture Officer

Mr. Michael Kerst, Acting Food and Agriculture Officer, Normally Food For Development Division

Dr. Jóse Luís Díaz, USAID/ATT Project Manager
Mrs. Erna Kerst, Program Officer
Mr. Carlos Ayala, Sustainable Environmental Management Project Manager
Mrs. Veronica Díaz de Ferrero, Chief, Training and Social Development Division
Ms. Lucy Hardmeier, Participant Training Assistant
Ms. Vicky Chanduvi, Secretary
Ms. Poupee Cavero, Secretary

U. S. Department of Agriculture, Foreign Agricultural Service

Mr. William Emerson, Agricultural Attache

MINISTRY OF THE PRESIDENCY

César Morgan Alcalde, Vice Minister for Regional Development

MINISTRY OF AGRICULTURE

Absolón Vásquez, Minister of Agriculture
Rodolfo Matsuda, Vice Minister of Agriculture

ATT COORDINATING COMMITTE

Juan Chavez, INIA
José Perea, FUNDEAGRO
Hernando Guerra, ONA
Carlos Lescano, UNALM
Luís Scarneo, SECRETARIO ATT PROJECT
Rafael Espinoza, GOP ATT PROJECT MANAGER
Jóse Luís Díaz, USAID ATT PROJECT MANAGER

SECRETARIAT TTA

Alberto Sato Abe, President
Luís Scarneo W., Assist Administrator

UNIVERSIDAD NACIONAL AGRARIA-LA MOLINA (UNALM)

Jose A. Estrada A., Professor Emeritus
Carlos Lescano Anadon, UNALM Project Manager, ATT Project
Jóse Dancé Caballero, Rector
Luís Maezono Yamashita, Manager TTA/UNALM and Director of Post Graduate Studies
Walter Zegarra Escobar, Manager TTA/UNALM and Dean Faculty of Economy and Planning
Pedro Cueva Martin, Manager TTA/UNALM
Francisco Delgado, Vice Rector
Carlos Herrera, RR.PP.
Sasay Siura, Horticulture Specialist
Delia Marticorena, Rural Construction

Leila Estrada Ore, Dean, Food Industries
Miguel Delgado G., Chief Social Projection
Roberto Ugas, Horticulture Teacher
Carlos Lescano, Manager PTTA
Walter Fegan, Manager TTA
Salomon Helfgott, Departamento Fitotecnica
Hugo Soplin, Departamento Fitotecnica
Luz Gomez Pando, Departamento Fitotecnica
Inés Redolfi Dehuiza, Departamento Biología
Leonor Mattos C., Departamento Fitopatología
Guillermo Sanchez V., Departamento Entomología
Eyla Velasco Urquizo, Directora, Programa Nacional de Recursos Genéticos y Biotecnología
José Luís Alvarez C., Programa Frutales
Heriberto Picho M., Proyecto Control de Plagas y Enfermedades
Justino Velasquez M., Sub-Programa Aguas y Suelos
Valeriano Huanco S., Sub-Programa Papa y Camote
Juan Vilchez Bautista, Ex-Director de Investigación Pecuaria
Dr. Klaus Raven, Departamento de Entomología
V. Villagómez, Potato Program
J. Chura, Corn Program
M. Romero/L. Gómez, Cereals Program
Andres V. Casas, Horticulture Program
C. Gómez, Enriched Foods Program
J. Almeyda, Animal Research
M. Gutiérrez, Bio Technology
J. Fano, Data Processing
J. Vargas, Milk Processing
M. Ríos, Data Management
B. Kroll, Forestry

NATIONAL AGRICULTURAL LIBRARY, UNALM

William Hurtado De Mendoza, General Director
Dora Mori Herrera, Coordinator National Information and Documentation System (SNIDA)
Dalia Sivina Hurtado, Technical Director of Information System

FDA-UNALM

A. Chung

Organizacion National Agraria (ONA)

Ing. Hernando Guerra Garcia C., General Manager
Sr. Gustavo Garcia Mundaca, President
Raúl Chao Aragón, Head of Rural Women's Project
Alfredo Coronel Zegarra, Organizational Manager
María Isabel Abad Pomar, Manager Financial and Planning
Enrique Paco Miranda, Technical Advisor
Alberto Massaro Silva, Past President
Juan Pecihua Cerna, Technical Manager

Luís Cruz Carazas, President, Regional Organization, Arequipa
Members of the Board of Directors

Fundacion para el Desarrollo del Agro (FUNDEAGRO)

Dr. José M. Toledo, Executive Director
Ing. Rafaél Espinoza Mosqueira, Government of Peru Project Manager, ATT Project
Ing. Alberto Sato Abe, Chief, Secretariat, ATT Project
Ing. Luís Scarneo Wilson, Administrative Assistant, Secretariat, ATT Project
Sra. Betty Olano de Calmet, Planning Specialist, Secretariat, ATT Project
Sr. José Perea Cáceres, Project Manager, FUNDEAGRO ATT Project Management Staff
Sra. María Elena Cordova Ojeda, Technical Assistant, ATT Project Management Staff
Carlos Herrera, Seed Specialist
Felix Quevedo I., Research Coordinator
Rafael Franciosi, Fruit Advisor

Instituto Nacional de Investigacion Agraria (INIA)

Dr. Alfonso Cerrate V., Director
Dr. Juan Chavez, ATT Project Manager for INIA
Ing. Antonio Chavez Vergas, former INIA Research Director (1985-1990)
Leonor Porles Blas, Technical Coordinator TTA
Luís Gonzales Gamio, Rural Extension Coordinator
César Miranda C., Coordination of Administration
José Manuel Mejía, Coordinator of Diffusion
Enrique Moya B., Director Technology Transfer
Martha Cruz, Asesora en Comunicación y Transferencia de Tecnología
Ing. Humberto Tascayo, Investigación Forestal y Vida Silvestre
Ing. Eyla Velasco Urquizo, Investigación Recursos Genéticos
Dr. Alex Grobman, Former Technical Director INIA
Dr. Javier Gasso, Former Executive Director INIA
Dr. Alfonso Serrak, Executive Director INIA
Dr. Julio Benavides, Director General for Research
Ing. Enrique Moya, Director General for Extension
Dr. Hugo Sanchez, Research Advisor
Dr. Luís Narro León, Director Corn Program
? Director Sanidad Vegetal Program
? Director Water and Soil Program
? Director Potato Program
? Director Tropical Fruit Program
? Director Fruit Program

INIA - IQUITOS

Hugo Villachica, Chief Tropical Crops
Otoniel Mendoza, Director San Roque Experiment Station
Consuelo Picón, Research Assistant Tropical Crops

INIA–Chincha, Estación Experimental Agraria

Ing. Luís Chumbiauca Retamozo, Coordinador PILG
Ing. Eladio Cantoral Quispe, Unidad Semilla
Ing. Juan Munive Olivera, Coordinador PROINSAVE
Ing. Leandro Aybar Peve, Coordinador PROIRGEN
Ing. Juan Pablo Molina Orosco, Coordinador PIPAC
Biol. Angel Valladolid, Director, Investigación, Leguminosas de Grano

Estación Vista Florida, Chiclayo

Ing. Julio Mondragon Villar, Director, EEAVF
Dr. Carlos Brussone Cordova, Jefe, Programa Nacional de Arroz
Biol. Angel Valladolid, Jefe, Programa Nacional de Leguminosas

INIA STAFF AT

HUALTACO
CHIRA
CAÑETE
MUYUY
SAN ROQUE
EL DORADO

INIA - TARAPOTO

Ing. Antonio Lapey, Director Experiment Station EL PORVENIR (visit in Iquitos)

INIA–Estación Experimental Agropecuaria Zonal "Illpa"

Ing. Juan Rolando Ponce Medina, Experiment Station Director
Members–Experiment Station Research and Dissemination Staff

INIA - SAN CAMILO - AREQUIPA

Dr. Jaime Villavicencio V., Jefe Sub Programa Ruminantes Menores y Bovinos
Ing. Raúl Murga Oliveros, Coordinator, Sub-Program Pastos Andinos
Dr. Luís Alvarez Salcedo, Coordinator, Sub-Programa Ruminantes Menores y Bovinos
Ing. Nancy Kajjakk Castañeda, Coordinator, Sub-Programa Crianzas Familiares
Ing. Ricardo Flores Macedo, Coordinator CTTA
Ing. Olga Jordan Ortega. Coordinaator Cultivos Andinos
Ing. Humberto Pozo Manrique, Coordinator Sanidad Vegetal
Ing. Jorge Medina Loayza, Coordinator PROINGEN
Lic. Victoria Frizancho, Coordinator PIAS
Ing. Gladys Suarez, Coordinator Cereales
Ing. Edgar Bedoya Vargas, Coordinator Sub Programa Leguminosas
Ing. Carlos Solís García, Coordinator Hortalizas
Ing. Jóse Torres, Director Estación Experimental

**PIURA**

Universidad Nacional de Piura (UNP)

Sr. Hugo Agurto Plata, Rector
Ing. Agro. Luis Vinas Varona, Academic Vice-Rector
Ing. Freddy A. Aponte Guerrero, Dean, School of Industrial Engineering
Ing. Jose Ordinola Boyer, Director, Graduate School, Rural Development Master's Program
Sr. Carlos Lopes Andia, Anthropologist and Professor
Sr. Segundo Castaneda Vigo, Statistician and Professor
Dr. Habame Celis A., Veterinarian and Professor
Sr. Jorge Chaura V., Agronomist
Ing. Juan Carlos Torres M., Agronomist and Professor
Ing. Maximo Sotomayor Anchante, Coordinator, UNP Graduate School
Dra. Colonia Castillo Rosales, Administrative-Financial Coordinator, UNP Graduate School
Ing. Miguel Galecio Julca

Scholarship Recipients–UNP:

Adrian Guzman Zegarra, M.S. Animal Breeding, Universidad Austral (Chile), Veterinarian, Department Head and Professor, UNP
Sr. Humberto Correa Canova, UNP M.S. Graduate student, Professor, UNP
Ing. Elvi Coronado Rodrigues, UNP M.S. Graduate student
Sr. Martin Castillo Agurto, UNP M.S. Graduate student
Sr. Duberli Andrade Vasquez, UNP M.S. Graduate student
Srta. Silva Kcomt Changman, UNP M.S. Graduate student
Ing. Francisco Albuquerque Vera, UNP M.S. Graduate student
Ing. Julio J. Miranda More, UNP M.S. Graduate student
Srta. Maria Albanil Ordinola, UNP M.S. Graduate student
Sr. Adolfa Zeta Vite, UNP M.S. Graduate student
Sra. Olinda Basauri de Carrasco, UNP M.S. Graduate student
Ing. Edgar Villanueva G., UNP M.S. Graduate student
Sr. Bruno Alberto Salas Meza, UNP M.S. Graduate student

New UNP Graduate Students without Scholarships

Ing. Carlos Cumpa La Cotera, Professor, Universidad de Tumbes
Ing. Luis Bermejo Requena, Professor, Universidad de Tumbes
Srta. Elisa Garcia Cedano, Animal Technician
Ing. Maria M. Puican Chinguel, Agronomist
Srta. Mirelda Coro Jaramillo, Economist
Sr. Justino Flores Moran, Economist
Sr. Oscar Martinez Benites, Economist
Sr. Segundo Calle Ruiz, Economist and Professor, UNP
Sr. Federico Guerrero Neyra, Economist and Professor, UNP
Srta. Carmen Vegas Palomino, Economist

Universidad de Piura

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Sr. Antonio Nobres Torello, Rector

Estacion Experimental Agropecuaria "El Chira"

Ing. Franklin Senmache O., Investigación Oleaginosas
Ing. Esteban Pinao Jimenez, Director de Producción
Ing. Manuel Guerrero Renteria, Coordinador Programa Leguminosas de Grano
Ing. Pedro Reyes More, Coordinador Programa Recursos Genéticos

Agricola Saume S. A.

Ing. Benjamin Rey T., Managing Director

**AREQUIPA**

Centro Hortofruticola de Zonas Aridas (CHOFZAR)

Sr. J. Enrique Lozada Casapia, President, Santa Rita Cooperative
Sr. Carlos Lozada Garcia, Farmer
Sr. Miguel Paz, Economist
Other farmers, cooperative members and employees

MUJER RURAL - AREQUIPA

Sra. Guadalupe Benavente, Presidente Comité la Colina
Sra. Norma Neyra, Promotora Mujer Rural

IRRIGACION MAJES : VIVERO VITIVINICOLA - AREQUIPA

Ing. Harvey Mogrovejo Alfaro, Investigador en Uva
Dr. Paolo Luccio, Experto Italiano en Gandería

CAU SANTA RITA

Sr. Ernesto Polo, Presidente de la CAU Santa Rita
Dr. Luís Loyaga, Médico Veterinario
Ing. Carlos Lozada, Asesor

Instituto del Sur

Sr. Alonso Quintanilla Perez Wicht, Director General
Sr. Juan Carlos Paz Alcanzar, Administrative Director

Universidad Nacional San Augustín

Dr. Hugo B. Mezco Mogrovejo, Veterinarian
Prof. Adalberto Medina V.
Dr. Rolando Cornejo Cuervo, Vice Rector Académico
Various Other Members of the Faculty and Administration

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PUNO

Universidad Nacional del Altiplano (UNA), Facultad de Ciencias Agrarias

Ing. Winseslau Medina Espinosa, Food Industry, Grant recipient (for work on the thermodynamic parameters of freeze dried potatoes)
Sr. Juan Aguilar
Other members of the faculty and staff

Scholarship Recipients–UNA:

Dr. Juan Astorga, Range Management Professor, Ph.D. recipient, Utah State University
Sr. Samuel Pino Valencia, UNA M.S. Graduate student in Andean crops (frost resistant potatoes)
Sr. Miguel Rodriguez Ponce, UNA M.S. Graduate student in Andean crops (precocious varieties of potatoes)

New UNA M. S. Graduate Students without Scholarships (Research interests)

Ing. Baltazar Quispe Cahaupaza, Agronomist, (haba, tarhui and arveja breeding)
Ing. Policarpo Catacora C., Agronomo, (quinua and canihua breeding)
Sr. Hernan Zaavedra A., (plant health in Andean crops)
Sr. Gamalial Laguna Loza, Biologist, (processing of Andean products)
Ing. Victor Canaza Mamani, Agronomist (water use in minor Andean tubers)
Ing. Domingo Cruz Valdez, Agronomist (irrigation and rural development)
Ing. Marco Alexis Vera Gomez, Agronomist (Quinua marketing)
Ing. Jose Zevallo Gomez, Agronomist (Agricultural production)
Srta. Martha Aparicio Saavedra, Biologist, (Minor tubers)
Ing. Juan Galvez Ormachea, Agronomist, (Processing of products)
Ing. Valentin Arapa Huanca, Agronomist, (native and cultivated pasture improvement)

FONAGRO

Ing. César Montes, Presidente
Ing. Moises Pachas Mesias, Gerente
Ing. Ivan Muente Luque, Administrador
Ing. Juan Lazo Alvarez, Director de Investigación

ADEX

Salomon Díaz, Director
Manuel Portugal Velarde, Exterior Commercial Manager

FARMERS / PRODUCERS

- PIURA AREA
- CHICLAYO AND TRUJILLO AREAS
- SAN MATEO (SIERRA) AREA
- CAÑETE AREA
- CHINCHA AREA
- IQUITOS AREA

CODESE's

- STAFF IN PIURA
- STAFF IN CHICLAYO
- STAFF IN TRUJILLO
- STAFF IN CUSCO
- STAFF IN AREQUIPA

CDT's

- STAFF IN PIURA
- STAFF IN CHICLAYO
- STAFF IN TRUJILLO
- STAFF IN CUSCO
- STAFF IN AREQUIPA

VALLE GRANDE INSTITUTO RURAL

David Baumann Samanez and selected staff

UNIVERSIDAD NACIONAL DE LA AMAZONIA PERUANA - UNAP (Iquitos)

Ing. Bertha Ikeda Araujo

UNIV. NACIONAL DE SAN MARTIN - TARAPOTO

Raúl Espiritu, Dean of the Faculty of Agronomy (Discussion in Iquitos)

Asociación Civil Pro-ICA

Ing. Luís Solís Bartra, Gerente
Ing. Raúl Vera Tudela Guembes, Presidente Consejo Directivo

Asociación De Agricultores Del Valle de Cañete

Ing. Carlos Siles, Tesoro
Ing. Alvaro Quijandria, Secretario
Ing. Jorge Bustamante, Vocal
Ing. Vicente Zegarra Suarez, Jefe Fitomejoramiento
Ing. Felizardo Fabian Vergara, Jefe Sanidad Vegetal

Instituto de Desarrollo Agrario de Lambayeque (IDAL)

Ing. Jorge Zuñiga Morgan, Gerente General
Ing. Germán Fernando Castro, Director
Ing. Gerardo Pastór Boggiano, Presidente Directorio



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## OTHER VISITS

Field day Cañete, Introducing a new variety of camote (INIA)
Seminar, Lima, Agricultural Credit Alternative Fundación Friedrich Ebert
Field day (San Mateo Sierra), to harvest Potato variety trials, UNALM
Food processing Plant, UNAP, Iquitos.
International Center for Research in Agroforestry (ICRAF)

## EXPERIMENT STATIONS / FACILITIES VISITS

HUALTACO--Nursery fruit, mango, citrus.
CHIRA--Rice, cotton, cowpeas, soil Lab., cotton breeding
VISTA FLORIDA--Rice, Cowpeas, Sunflower, Seed Bank, Seed Lab., Soil Lab., Library
COMMERCIAL LEMON COMMITTEE--Buys and sells fresh lemon
SAN ROQUE

## RURAL WOMENS PROGRAM

Gerardo Arenas Dijo, Chiclayo
Iris Barboza, Chiclayo
Amparo Anhuaman, Trujillo
Teodora Dionicio Torres, Ancash - Huaraz

And Program Sites At:

EL DORADO
MUYUY
SANTA RITA
SAN CAMILO
SEED PROCESSING PLANT

## CORDESA

Ing. Enrique Castro, Presidente
Ing. Alberto Medina, Representante de la Universidad
Ing. Carlos Herrera, Asesor Comisión Nacional de Semillas

## CORDESE - CUSCO

Ing. Buenaventura Hermoza, Presidente/Rep. Arariwa
Ing. Rosa Zuñiga Valle, Secretaria/Rep. ONA, ORA INCA CUSCO
Ing. Virginia Lama Cáceres, Tesorera/ INIA
Ing. Jóse Luís Burga Colán, Gerente/Funcionario pagado por TTA

## OFICINA RURAL AGRARIA - INCA

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Ing. José Luís Sumár, Presidente
Ing. Raúl Marín Manga, Vice Presidente

UNIVERSIDAD NACIONAL SAN ANTONIO ABAD - CUSCO

MAG. Mario Gongora Santa Cruz, Vice Rector Académico
Ing. Gregorio Meza

MUJER RURAL

Ing. Rosa Zuñiga Valle, Promotora

PERVIDEA

Dr. Mario Marquez Valle, Presidente

OTRAS INSTITUCIONES -CUSCO

Ing. Ronald Delgado Sumár, Molinos Cusco
Ing. Rebeca Frisancho, Proyecto SEIMPA
Ing. Rosa Zuñiga Valle, ONA
Ing. Buenaventura Hermoza, Asociación Arariwa
Ing. Virginia Lama Cáceres, INIA
Sr. Nestor Guevara, FARTAC
Sr. Raúl Marín Manga, CODEAGRO
Ing. Luís Súmar Kalinowski, ORA - INCA

ESTACION EXPERIMENTAL "ANDENES"

Ing. Roberto Horque, Director
Miriam Gamarra Flores, Investigadora Principal en Leguminosas de Grano
María Villena Rosas, Investigadora Principal en Papa y Camote
Ladislao Palomino Flores, Investigador Principal Evaluación Semillas - Papas
Ing. Braulio Chavez Tamayo, Jefe Sub-Programa de Cereales
Hernan Altamirano Vásquez, Investigador Principal en Cereales

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## SCOPE OF WORK

## USAID/PERU ATT PROJECT FINAL EVALUATION

## AGRICULTURAL EXTENSION SPECIALIST

### I. BROAD TERMS OF REFERENCE

The Vendor will travel to Peru, and points therein as necessary, to assist in the final evaluation of the USAID/Peru Project "Agricultural Technology Transformation" (ATT). The Vendor will work with personnel of the full evaluation team (three US and four Peruvian members), designated USAID/Peru staff, and personnel of the Peruvian public and private sector organizations participating in the ATT Project.

The Vendor will focus primarily on those components and activities of the Project dedicated to improving the performance of the Peruvian public and private sector organisations transferring validated new agricultural technologies to farmers and farmers' organizations targeted by the Project. Specific tasks and questions to be addressed are listed below. He will collaborate closely with the Team's agricultural research and institutional development specialists.

The vendor will prepare a final report outlining his findings and recommendations to be incorporated in the formal evaluation report to be prepared by the Team's Chief-of-Party. In addition, the Vendor will be prepared to participate in verbal briefings about his findings to be held during the last week of the evaluation for personnel of USAID/Peru and designated Peruvian counterparts.

### II. SPECIFIC ISSUES TO BE ADDRESSED BY VENDOR

The issues to be addressed by the Vendor shall include, but not necessarily be limited to, the following:

A. Appropriateness of basic Project design in achieving the proposed objectives, including adjustments, if any, to project design required to make implementation more effective in the future;

B. Appropriateness, adequacy, and effectiveness of the organizational, administrative, and management structure of the Project, with special reference to validation and transfer of new agricultural technology via public sector extension workers and private sector field specialists;

C. Level of performance/effectiveness of the NSCU/MTAC contract in provision of re quired technical assistance;

D. Level of training and effectiveness of corps of 55 specialists serving as link between research and those providing technical assistance to growers under the Project;

E. Collaboration between the 55 specialists and the Ministry of Agriculture extension personnel;

F. Relationships developed among producer associations, agribusinesses, and consulting firms fomenting technology transfer under the Project;

G. Effectiveness of mass communications employed by Peruvian experiment stations and Technology Dissemination Centers;

H. Effectiveness of private sector participation in technology transfer;

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I. Effectiveness of Improved Seed Program initiated under the Project.

## III. PERIOD OF PERFORMANCE

The Vendor will work up to 32 days under this purchase order. He will travel to Washington, DC o/a May 6, 1993 to participate in pre-evaluation team building exercises; he will then travel to Lima, Peru o/a May 9, 1993 and return to College Station, Texas o/a June 11, 1993. A six-day work week is authorized during this period.

## IV. FEE AND PAYMENT

Upon receipt of request for payment and satisfactory completion of work described above and acceptance of vendor's final report, the Government will pay the Vendor an amount not to exceed $9,984. Request for payment and final report should be sent to:

Gary H. Smith
Inter-American and International Programs
USDA/OICD/DRD
Agriculture South Building
Washington, DC 20250-4300

## V. TRAVEL AND *PER DIEM*

The Government will provide for all required travel and *per diem* outside this purchase order in accordance with Federal travel regulations.

Applicable Purchase Order terms and conditions are attached.

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Biographical Infomration–Evaluation Team Members

## DR. CHARLOTTE I. MILLER

Charlotte I. Miller is Chief, Information Resources Management Branch, Animal and Plant Health Inspection Service (APHIS) of the U. S. Department of Agriculture. In that capacity, she is responsible for the strategic information resources planning for APHIS, including business process reengineering efforts of the Agency.

She lived and working in Peru from 1976 through 1979 during which time she conducted a number of evaluations and/or social soundness analyses for the Agency for International Development's Mission to Peru. These activities included an impact evaluation of the Rural Enterprises Project in 1978, a social soundness assessment for an Integrated Regional Development project for Junin and Cajamarca in 1979, and a social soundness assessment of a proposed urban housing assistance program through Peruvian savings and loan associations (1979). She also worked briefly for the International Potato Center's Social Sciences Unit preparing bibliographic summaries on selected subjects. In 1980, she was contracted to review literature, prepare briefing materials and conduct briefings on the household use of water in rural Peruvian households in the highlands as a part of the preparation of a centrally funded AID evaluation on PVO-sponsored potable water and sanitation projects. In 1981, she was again contracted by the AID mission to lead the effort to assess the socio-economic impact (including environmental variables) of opening the highway from Chanchamayo to Iscocasin in the Palcazu Valley as a preliminary step in project planning for the valley. In 1983, she again returned to Peru to develop training materials based on a garden development activity there. The materials were for a centrally funded project sponsored by AID's Office of Nutrition on the integration of nutrition and food policy concerns in agricultural projects.

She subsequently worked on an evaluation of a major, and controversial, rural development project in Nepal, the design of an agro-industrial project (oil-seed processing) in Burma, and the integration of food consumption and nutritional concerns in Ecuadorian agricultural research. In recent years, she has been part of U.S. delegations dealing with import and export issues with France and the European Economic Community (EEC), specifically, the inspection of French goose and duck livers for process and export to the U.S. and the outbreak of trichinosis in humans in France, attributed to U.S.-origin horse meat (which had resulted in the abrupt cessation of U.S. exports of meat and poultry to the EEC.)

She received her Ph.D. degree in Anthropology from the University of Florida in 1976 with a certificate in Latin American Studies. Her dissertation research covered the impact of urbanization on kinship networks of agrarian elite families in Minas Gerais, Brazil. She also hold the B.A. degree in History from Carleton College. She was born in Quito, Ecuador. She is married to Robert W. Werge and has three children: Jose Robinson Canas, Ingrid E. Werge, and Thomas E. Werge. She currently lives in University Park, Maryland.

Work Address:
APHIS/M&B/ISCD
6505 Belcrest Road, Rm. 717
Hyattsville, MD 20782
Office Phone: (301) 436-5328
Fax: (301) 436-7965

## JOHN B. O'DONNELL

Mr. O'Donnell is a retired A.I.D. Foreign Service Officer with over 30 years of experience in agricultural and rural development programs in Latin America and Southeast Asia. He retired in June 1991 and has been working as an independent consultant since then.

From 1962 to 1970, Mr. O'Donnell held various A.I.D. positions related to agriculture and rural development in Vietnam, Thailand and Peru. He also served as A.I.D. Officer-in-Residence at the Asia Training Center where he directed rural development training programs for A.I.D. officers assigned to Southeast Asia.

From 1971 until his retirement in 1991, Mr. O'Donnell specialized in Latin American programs with assignments as Chief of the Office of Agriculture and Rural Development in Peru (1977-1982) and Ecuador (1985-1987) and Deputy Chief in Guatemala (1974-1977). He was also Deputy Director and Acting Director of the Science and Technology Bureau Office of Rural and Institutional Development (1982-1985), Deputy Agency Director for Human Resources in the S&T Bureau (1987-1991) and recipient of A.I.D.-sponsored graduate training in Agricultural Economics at Cornell University (1973-1974).

Since his retirement in June, 1991, Mr. O'Donnell has participated in a number of short-term consultancies including team leader for an evaluation of the RDO/C Agricultural Research and Extension Project, consultant on preparation of a Food Assistance Strategy for USAID/Peru, consultant on preparation of the PID for the S&T Bureau Agribusiness and Marketing Improvement Strategies Project, consultant on sustainability issues for the Ecuadoran Agricultural Development Foundation (FUNDAGRO), the Jamaica Agricultural Research Project and the Peruvian Agricultural Development Foundation (FUNDEAGRO), co-author of the evaluation of the USAID/Ecuador Agricultural Sector Reorientation Project and team leader for design of the USAID/Ecuador Agricultural Sector Development Project.

During his A.I.D. career and his recent consulting assignments, Mr. O'Donnell has designed, managed and evaluated a wide range of agriculture and rural development projects including a number in agricultural research, extension and education, agricultural policy and planning, agricultural marketing, regional development, cooperative development and food aid programs.

Mr. O'Donnell graduated from Stanford University in Economics and History and did graduate study in Economics and Agricultural Economics at Cornell University and the University of Hawaii.

## DR. LARRY M. BOONE

### EMPLOYMENT HISTORY

**CORPORATE MANAGEMENT 1987-1993**

**Associate Executive Director (Executive Vice-President),** Consortium for International Development (Non-profit). Responsible for Program Development (Marketing), Staff Development, and assisted overall Corporate Management. Developed low-cost program for improving communications with 11 member

universities about international donor-funded project developments. Identified and tracked potential projects. Coordinated and contributed to proposal development. Improved member and client relationships, improved service quality and reliability. Expanded the number of training, education and natural resources projects in the portfolio, and added World Bank, Asian Development Bank and other multi-lateral organization projects. Recruited permanent and temporary staff. Supervised office staff. Backstopped worldwide training project.

## PROJECT LEADERSHIP, MANAGEMENT AND EXECUTION, 1968-1987

Employer: United States Department of Agriculture (Major assignments over 20-years)

1986-1987--**Senior Agricultural Development Advisor** on assignment from USDA to the Agency for International Development. Advised on improving the continuous strategic review of A.I.D. agriculture and rural development activities in Latin America and the Caribbean. Contributed to updated regional strategic plan for development interventions. Contributed to Agency definition of agriculture and rural development focus and mission statements for all regions. Participated in Agency review of Mission country program plans. "Backstopped" regional Missions on agricultural policy. Supported increase in Mission and Agency country data collection to support program and project planning.

1981-1986--**Team Leader** of a technical assistance team of up to 75 members in Riyadh, Saudi Arabia. Provided project leadership and management. Represented the U.S. Government and U.S. private interests in Saudi agricultural development. Provided leadership and coordination in program work plans, achieved quality and efficiency in $85 million operation, Developed and controlled budgets, and evaluated multi-disciplinary development efforts. Supervised all recruitment, personnel management, procurement, a large equipment maintenance and use scheduling operation, an international training program, and employee evaluation. Supported staff through difficult cultural adjustments, and arranged career enhancing opportunities for both U.S. and Middle Eastern staff.

1979-1981--**Research Economist** Member of interdisciplinary team to develop research approaches to assess and analyze resource production potential and development/use problems in developing countries; evaluated the suitability of national policies, administrative arrangements, and necessary information management capabilities for implementing recommended development methods. Developed programs to train national officials to perform needed analyses and evaluations. Tailored research approaches to specific national circumstances, analyzed resulting information, and developed recommended resource development programs for cooperating countries.

1975-1979--**Information Management Advisor** to the research and extension agencies of six Central American countries. Advised on establishing research priorities; managing research programs; acquisition, processing, storage and retrieval of data; establishment of internal information management systems; and analysis, support and modification of farming systems. Developed training workshops to train national technicians in those areas. Developed an area profile system to assist research and extension agents in guiding farmers in the development and management of farming systems adapted to their areas and resources. Developed and led a series of national workshops to teach research and extension workers to apply area profile procedures in their program planning. Advised on strengthening institutional and administrative capabilities to administer agricultural programs.

1974-1975--**Research Group Leader** for studies of the control of water pollution by soil and chemical residues from large cultivated land areas. Coordinated research development efforts with researchers from other government agencies.

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1971-1974–**Principal Investigator** for a study of the economic impact of large scale hail suppression programs in high-hail-risk areas of the midwest and great plains. Coordinated research results and new applications with other government agencies involved in weather modification research. Produced comprehensive estimates of crop losses due to hail in the United States.

1968-1971–**Production Economics Advisor** to the Ministry of Agriculture in Bogotá, Colombia. Evaluated information needs and availability for policy decision making regarding agricultural production and marketing. Evaluated possible policy measures to strengthen the agricultural sector. Trained local staff in analytical methods applicable to policy research and evaluation. Led an analysis of Colombia's agricultural machinery import policies, in comparison with its stated policy of small farmer development. Supervised analysis of Ministry and agricultural bank operations policies for the distribution of agricultural inputs.

## UNIVERSITY TEACHING AND RESEARCH, 1965-1968

**Assistant Professor** of Agricultural Economics, University of Tennessee, Knoxville, Tennessee. Taught Agricultural Policy and Finance at the graduate and undergraduate levels. Developed and taught special short-courses in the same subjects to extension agents, agricultural finance organization staff and farmers. Advised several Masters Degree and Ph.D. degree candidates. Served as Department advisor to undergraduate majors.

## INTERNATIONAL TRAINING

1975–**Instructor** for a two week course on Agricultural Finance Policy in Bolivia. Participants were high-level officials of the Agricultural Bank, the Ministry of Agriculture and the Central Bank.

1973–**Principal Instructor** in a five week course in the Analysis of Development Project Investments in the Dominican Republic. Participants were from several public sector agencies, and were primarily young, management-destined individuals.

## EDUCATION

**Ph.D.** in Agricultural Economics, Washington State University
**M.S.** in Agricultural Economics, Kansas State University
**B.S.** in Agricultural Economics, Kansas State University

**LANGUAGE** Spanish–speak fluently; read and write adequately for working communications. Have taught technical courses, and drafted many communications and reports in the Spanish language.

**AWARD** Recipient of the USDA/OICD International Honor Award in 1985 for excellence in international assistance activities.

**CONTACT** Larry M. Boone, Ph.D.

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# CLARENCE JAMES MURPHREY (JIM)

Active, highly qualified, experienced specialist/consultant/manager seeking challenging long or short term assignment in Agriculture, Agro-industry, Export Marketing development.
Over 15 years of International Agriculture-Agro industry development experience employed by Texas A&M University, Agricultural Extension Service and the United States Department of Agriculture (USDA) before retiring in 1983.
Since retiring from Texas A&M / USDA in 1983 I have had ten (10) active years as a private consultant in Agribusiness, Export Marketing, and private sector development.

## PERSONAL DATA


Address: [redacted]

Telephone: [redacted]
(409) 693-9940 (O)

FAX: (409) 776-1504


Date of Birth:
Place of Birth:
Social Security No.:

## EDUCATION

Texas A&M University, Post Graduate Studies - Ag Education, 1965-66
West Texas State University, Post Graduate Studies - Economics, 1966
Michigan State University, Post Graduate Ph.D. Studies, Agricultural Economics/Ag Policy, 1957
Texas A&M University, Masters of Education Degree, 1953
Bachelor of Science, Agricultural Education Degree, 1948

## LANGUAGES

English and Spanish

## COUNTRIES WORKED IN

North America
United States (R) (ST)
Canada (ST)
Mexico (ST)

Caribbean
Dominican Republic (R) (ST)
Jamaica (R) (ST)
Haiti (ST)
Grenada (ST)

Central America
Guatemala (R) (ST)
Costa Rica (R)
Panama (ST)
Nicaragua (ST)
Honduras (ST)
El Salvador (ST)
Belize (ST)

South America
Ecuador (ST)

Middle East
Saudi Arabia (R) (ST)
Afghanistan - Pakistan (ST)

(R) = Resident assignment of 2 years or more
(ST) = Short term assignment of 2 weeks to 7 months duration

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## COUNTRIES TRAVELED

| | |
|---|---|
| Europe: | England, Holland, France, Germany, Switzerland, Spain, Portugal, Italy, Austria, Belgium, Ireland |
| Mediterranean: | Greece, Egypt, Morocco, Israel |
| Far East-Asia: | Thailand, Japan, Philippines, Hong Kong |
| Middle East: | Jordan, Turkey |
| South America: | Colombia, Venezuela, Peru |

## MAJOR EMPHASIS AND EXPERTISE

### PROJECT MANAGEMENT

- Project management, Chief of Party, Team Leader for Agriculture, Agro industry, Export Marketing and Environmental Protection projects
- Liaison services among US and foreign government programs/agencies; national and regional program/agencies and among public and private organizations within the agro industry and natural resource sectors.

### AGRI-BUSINESS, AGRO INDUSTRY AND MARKETING STRATEGY DEVELOPMENT

- Joint Ventures, private and public sector investments and business alliances
- Agricultural/Agro-industry credit and finance
- Marketing Strategies development for non-traditional fresh and processed agricultural products
- Market Searches, value added product development for targeted markets

### STRATEGIC PLANNING, PROJECT DEVELOPMENT AND EVALUATION

- Innovative opportunity searches, resource use planning
- Privatization of public properties, businesses and support services
- Performance appraisals and evaluations
- Agribusiness/agro industry organization
- Project design, evaluation, and strategies for measuring project impact
- Project identification documents (PID)
- Project proposals (PP), staffing and budget requirements

### AGRICULTURAL EXTENSION, TRAINING AND EDUCATION

- Small farmer and cooperative extension education systems
- Transfer of technology
- Study abroad participation education

## CONFERENCES ATTENDED - 1988-1991

1991 International Agribusiness Management Association Symposium – Global Agribusiness for the 90's, Boston, Massachusetts
1990 Expo-90 Export Conference, Seattle, Washington
1990 Expo-Import Bank Conference, Washington, D.C.
1989 Rural American International Trade Conference, Minneapolis, Minnesota
1989 U.S. - Canadian Free Trade Conference, Kansas City, MO
1989 Agri-Women Conference, Washington, D.C.
1989 Impact Center – International Trade Conference, Seattle, Washington
1988 U.S.Small Business Administration International Trade Conference, Dallas, Texas
1988 Exporting U.S.Southern Forestry Products, Atlanta, Georgia

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## PROFESSIONAL EXPERIENCE

Nov.-Dec. 1992

Emphasis:
-Strategic Planning
-Project Design
-Project Proposal Development

Islamabad and Peshawar Pakistan

**Served as consultant and coordinator assisting the Volunteers in Technical Assistance, VITA to develop a proposal to add an agricultural/agribusiness component to the current AID/VITA Afghanistan Agricultural Rural Rehabilitation project.**

April - May 1992

Emphasis:
-Developing strategies and training staff to measure project impact

-Afghanistan cross border program

Islamabad and Peshawar Pakistan

**Served as consultant and training specialist assisting USAID/VITA funded Afghanistan cross-border agriculture and rural road, bridge, and irrigation facilities rehabilitation project.**

Developed strategies, selected indicators and improved the capability of ARR/VITA staff to measure project impact on resource use, production, marketing, agribusiness, and quality of life and to select high priority sub-project sites and activities for future project work.

Aug.-Sept. 1991

Empasis:
-Non-Traditional Export Marketing

Ecuador

**Served as consultant and training specialist assisting USAID funded PROEXANT/FEDEXPOR non-traditional fresh and processed products export promotion project in Ecuador.**

Provided assistance and training for private exporters, food processors, investors, financiers and others involved in exporting. Provided assistance and training for staff members of PROEXANT/ FEDEXPOR.

Jan. 1991

Emphasis:
-Agri-business investment promotion
-Non-traditional Agricultural export promotion
-Cooperative Marketing

El Salvador

**Served as advisor/consultant for USAID funded non-traditional Agricultural Exports project that is assisting small farmer cooperatives in El Salvador.**

Served on a four person team preparing plans and documentation for a second phase five year follow on of the project. My input was relative to agri-business joint venture development including establishing linkages/alliances between cooperatives and processor/exporters as well as linkages/alliances between processors/exporters and foreign marketing/distributors.

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Oct.-Nov. 1989

Emphasis:
-Irrigation-Land Development
-Land Use Planning
-Marketing Strategies

(Assignment in Saudi Arabia)

**Consultant with Global Dimensions Corporation assisting Al Afandi Establishment with irrigated farm development in Saudi Arabia, including marketing strategies.**

Prepared an alternative land and water use plan for 400 acre-12 irrigation well farm in Saudi Arabia. A farm development plan was prepared; including plot plans and a report that evaluated priority alternatives and marketing strategies. The plan and report were based on farm site visits, soil and water analysis, climatic data, other information and data obtained in the Kingdom and from outside sources. (forage, sheep and goats; fruit, field and greenhouse vegetables, ornamental plants, industrial arid crops)

July 1988-1990

Emphasis:
-Program Development Strategies
-Entrepreneurship-Small Business Development
-Diversification and Value-Added Product Development
-Global Marketing Strategies Planning

150 day assignment during period July 1988-1990. Washington, D.. and selected states

**Consultant to USDA, Federal Agricultural Extension Service, Washington, D.C.,**

-Advising and assisting the Federal Extension Service and selected State Extension Services to identify roles and to develop strategies for improving rural American competency in world affairs and competitiveness in Global markets.

-Working with USDA/ES leadership and other public and private Agriculture-Agribusiness-Agro-Industry, small business and community leaders to establish within the selected states an entrepreneurial spirit and capability in rural America, fostering value-added product development, processing, product diversification, and competitive participation in the United States and foreign markets.

November 1988

Emphasis:
-Strategic Planning
-Sugarland Diversification

Dominican Republic

**Consultant to Clapp & Mayne/USAID Assisting the Consejo Estatal de Azucar in the Dominican Republic to develop strategies and program to:**

-Diversify national sugar lands to non-traditional export markets.

-Produce high value products for local and export markets.

-Generate employment and increase income.

Nov. 1987-June 1988

Emphasis:
-Environmental Impact Analysis - Guatemala Mediterranean Fruit Fly Eradication Program (MOSCAMED)

(7 mo. assignment based in Guatemala City, Central America) Also, worked in Mexico and Belize.

**Team Leader, Consortium for International Crop Protection (CICP), University of Maryland, College Park, MD.**

-Served as leader for a team of fifteen (15) core staff and short-term scientist/environmental specialist including: entomologist, ecologist, environmentalist, sociologist, medical doctors, lawyers, agronomist, economist, etc. The Environmental Impact Analysis (EIA) of the MOSCAMED-MED FLY Program was requested by the U.S. Congress. The CICP technical contract was funded by AID/Washington, with USAID/Guatemala providing in-country support through a contract with the Interamerican Institute for Cooperation Agriculture (IICA). The EIA was conducted in close coordination with the National Guatemalan Environmental Commission, which is part of the presidential staff. Over ninety (90) national and international organizations were invited and attended briefing and de-briefing meetings during the in-depth analysis. The results/report document was prepared in both the English and Spanish languages and give to AID for distribution to U.S., Guatemala, and international public and private organizations, including a report to the United States Congress.

Mar. 1987-Jul. 1987

Emphasis:
-Market Search in targeted markets, and marketing strategy development for specific Jamaican Specialty/Ethnic food crops

(4 mo. special assignment in the USA and Canada)

**Marketing Consultant, Agro-20 - Kingston, Jamaica.**

Conducted market search and developed marketing strategy for 16 specific Jamaican specialty and ethnic fresh produce products, by visiting major wholesalers, distributors, chain stores and other outlets in USA and Canada including: New York, Philadelphia, Boston, Washington, D.C., Baltimore, Chicago, Atlanta, Houston, New Orleans, Miami, Pampanoe Beach, and Homestead, Florida, San Francisco, Los Angeles, Toronto, Ottawa, and Montreal. Recommendations included names, addresses, telephone/telex/FAX numbers of prospective buyers and information relative to the most promising markets, price expectations, seasonal advantages, competitive factors, alternative marketing and transportation channels as well as requirements relative to quality, packing and promotion were present in a report and were explained personally and confidentially one on one to major exporters.

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Aug. 1984-Aug. 1986

Emphasis:
-Strategic Planning to: a) divest Government lands and Agro industries to the private sector investors; and b) establish a diversified market driven commercial Agriculture-Agro industrial sector in Jamaica.

(2 year resident assignment in Kingston, Jamaica)

**Director of Strategic Planning, Agro-21 - Agricultural Credit Bank, Kingston, Jamaica.**

Agro-21 is a special program of the Prime Minister's Office with support funding from USAID to commercialize the agriculture-agro industry in Jamaica. Two hundred thousand (200,000) acres of government owned/managed irrigated and rainfed lands, plus various agro industrial plants/facilities were made available to local and foreign investors using long-term (up to 49 years) leases, with emphasis on involving small farms as satellite farms (mother farm concept). The Strategic Planning Program provided leadership and information/data/analysis for the following priority activities:
1) Conducted market searches for Jamaican products to successfully enter the U.S., Canada and European markets;
2) Prepared profiles and evaluated investment potentials for the following: Fruits - Citrus, Papaya, Mango, Guava, Passion Fruit, Pineapple; Livestock - Beef Cattle, Dairy Cattle, Goats, Swine; Edible Oils - Coconuts, Soya Beans, Peanuts, African Oil Palm; Winter and Chinese Vegetables - Bell Pepper, Cucumber, Cantaloupe, Snap Green Beans, Sweet Corn, Snow Peas, etc; Spices, Condiments, Natural Food Coloring - Allspice, (Pimento), Ginger, Sorrel, Annatto, etc.; Ethnic Crops - Dasheen, Coco Yams, Sweet Potatoes, Green Coconuts, Callaloo, Plantain, etc; Ornamental Horticulture - Cut Flowers and foliage (Roses, Anthuriums, Heliconia, Red Ginger, Bird of Paradise, Orchids, Leather Leaf Fern, Ti Leaves, etc.), Many foliage, Plant clippings for rooting; Aquaculture - Fresh Water tilapia/Carp Fish, Prawn and Salt Water Shrimp; Specialty Items -Mushroom, Aloe Vera, Sea-Island Cotton, etc.; 3) Prepared models for the most promising diversification investments in agriculture-agro industries, after analyzing the alternate potentials; 4) Provided information/data and other development support to prospective investors; 5) Made assessments of policies, incentives, disincentives affecting the investment environment and made recommendations for improvements; 6) Provided technical and scientific problem solving assistance, using short-term contractors and USDA/PASA specialists in plant and animal inspection and quarantine, irrigation engineering and water use, credit systems analysis, seed and plant material multiplication, food technology, agro industrial facilities engineering, pest control, cost and competitiveness analysis; 7) Evaluated investment proposals and investment projects; 8) Established and maintained a technical reference information data base library and dynamic export market/price information service.

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Nov. 1983-Mar. 1984

Emphasis:
-Food & Agriculture Emergency Rehabilitation, Strategic Planning to restructure the Agriculture-Agro industries to divest Government Properties to Private Investors.

(special assignment in St. Georges, Grenada).

**Senior Agricultural Advisor, USDA/OICD USAID on an Emergency Rehabilitation team, St. George's, Grenada.**

One week after the 1983 Grenada rescue mission I was asked to serve as the Agricultural Advisor on the rehabilitation team along with a Medical Advisor, a school/education advisor, an infrastructor engineer, and a USAID administrative officer. Priorities in the first weeks included evaluating life support systems, food supplies, quantities, qualities, distribution/transportation, and food availability to the people. Also, taking emergency action related to transportation, roads, storage and processing facilities that affected food/agriculture-agro industry production and distribution. After emergency measures were implemented, the priorities shifted to strategic planning. A basic plan was drafted to restructure the agriculture-agro industry in Grenada, including strategies for divesting government owned farms/facilities to local and foreign private investors.

Nov. 2, 1983

Emphasis:
-Strategic Planning

(Special Assignment, Washington, D.C.)

**Special Advisor, U.S. Department of State, Washington, D.C.**

In November, 1983, I was asked to go to Washington, D.C. to meet with the bi-partisan (Kissinger) Commission on Latin America, to present ideas and recommendations relative to the problems and possible solution/strategies relative to major political, economic and social problems in Central America and the Caribbean.

Oct. 1-31, 1983

Emphasis:
-Development projects evaluation.

(special 1 mo. assignment in the Dominican Republic)

**Senior Agricultural Advisor Aid/W USDA/OICD.**

Served on AID/USDA evaluation team that made an impact evaluation of USAID projects in the Dominican Republic during the preceding ten years. Special focus was on agricultural credit.

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Apr. 1981-Jan. 1983

Emphasis:
-International Extension and Research Staff support and coordination.

(Special joint assignment with Texas Agricultural Extension Service and the USDA/OICD/ES Washington, D.C., 50% time in Washington and 50% in TAMU-TAEX, College Station, Texas).

**International Staff Support Officer, Texas A&M University/Texas Agricultural Extension Service and United States Department of Agriculture, Office of International Cooperation and Development.**

Responsibilities on this unique assignment included preparing and evaluating agriculture-agro-industrial production and marketing project proposals, staffing TAMU and USDA/OICD international development projects, providing technical support and coordination for foreign based staff working for TAMU-TAEX and for USDA/OICD.
Washington, D.C. and College Station, Texas.

Oct. 1982-Jan. 1983

Emphasis:
-Resettlement of small farm families to undeveloped area in Northern Guatemala.

**Special Project Officer, USAID/USDA/OICD/Texas A&M University.**

Managed the completion of a small farm land settlement project. Providing roads, rural medical clinic, rural schools, agricultural credit, extension and production inputs (tools, seeds, supplies, etc.) to 1500 families. Guatemala.

Sept. 1981

-Small farm production system research evaluation.

Haiti.

**Consultant, Texas A&M University/USAID**

Small farmer hillside production system assessment. Basic food crops; ethnic root crops, rice, fruits, vegetables and livestock. Haiti.

May 1981

-Basic food crops/products supply management and pricing.

Dominican Republic.

**Consultant, Texas A&M University/USAID.**

Agricultural marketing systems evaluation: pricing policies, basic grains-food crops storage, handling, distribution, surpluses and shortages management. Dominican Republic.

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1980-1981

Emphasis:
-Management
-Land, Water and National Park Resources Development
-Agro Business/Economic Services
-Agri/Agro Industry Production, Marketing, Research and Extension

(Resident Assignment in Riyadh, Saudi Arabia).

**Team Leader - Project Manager, U.S. Treasury - USDA/OICD ES, Saudi Arabia America Joint commission, MINAG Agriculture and Water Research Development project, Riyadh, Saudi Arabia.**

Responsibilities included project management, staff supervision for 51 agriculture and natural resource development specialists, planning, budgeting and implementing a $20,000,000 per year multi-disciplinary agriculture-agro industrial - natural resource development project. Emphases were on: land and water supply development, food technology laboratories services, food processing plant development, soil survey, range management, national parks development, Ministry of Agriculture and Water Services development in economics, extension, information/data, manpower development and other support services.

1973-1980

Emphasis:
-Management
-Small farm irrigated and rainfed cropping systems research and extension.
-Agriculture and Market News Information.

(Seven year resident ROCAP assignment, 3 years in Guatemala and 4 years in Costa Rica)

**Project Manager/Aid Liaison Officer, AID Regional Office for Central America and Panama (ROCAP), USDA/OICD/ES.**

Responsibilities included providing leadership, technical assistance and project management for the following ROCAP projects serving the five Central American countries and Panama: 1) Studies and analysis for diversification alternatives in Central America; 2) Small farms irrigated and rainfed crop and livestock systems research in the six Central American countries; and 3) Development of agricultural and marketing information systems in the six Central American countries and Panama. The ROCAP regional projects collaborated with the USAID mission in the six countries, with the local government organizations, and major public and private organizations serving the region including: InterAmerica Institute for Agriculture Cooperation (IICA), Tropical Agricultural Research and Training Center (CATIE), Central American Technology Research Center (ICAITI), Central American Bank (CABEI), secretariat for Integration of Economic Activities in Central America (SIECA), Central American Nutrition Research Center (INCAP), Latin American Development Bank (LAAD), research organization including Cymm T, and CIAT.

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1967-1973

Emphasis:
-Management
-Economic/Marketing Services
-Participant Training

(Six-year resident assignment in Santo Domingo, Dominican Republic).

**Chief of Party/Project Manager and General Economics Advisor, USAID/Texas A&M University, International Programs.**

Responsibilities during the six-year assignment included providing leadership and assistance in economic planning, resource use programming, agricultural policy formulation relative to research, agriculture production, marketing and agro industrial development. From 1970 to 1973, served as coordinator for the reorientation and placement program of 130 returning BS and MS degree graduate that had studied in U.S. Universities. The returning graduates were placed in both public organizations and private firms and were monitored during the first six months of employment. From 1971 to 1973, served as Chief of Party and Project Manager for the TAMU contact team of 25 agriculture/agri-business professionals assisting the Secretariat of Agriculture and other public and private agriculture and agro industry organizations.

1959-1967

Emphasis:
-Agricultural-Agribusiness, Farm Management Assistance
-Strategic Planning Water Resource Allocation

(8 year resident assignment in Amarillo, Texas serving 26 counties in the Texas Panhandle Area).

**Farm Management Specialist - Coordinator of the Panhandle Economic Program (PEP), Texas A&M University/Texas Agricultural Extension Service.**

Responsibilities included providing Extension assistance to Agricultural and Home Economic Agents in the 26 county area on agribusiness management, farm and home production cost and return analysis on irrigated and rainfed farms. Provided leadership and coordination for the PEP Panhandle Economic Program, an in-depth economic analysis of investment potentials in the 26 county area. The economic program was conducted in collaboration with the area's 63 commercial banks and other private and public organizations involved in agriculture and industry in the highly productive irrigated region.

1958-1959

Emphasis:
-Property Development, Improvement and Beautification

(Resident assignment in the Dallas, Texas area).

**Property Improvement/Landscape Planner, Lambert Landscape Company, Dallas, Texas.**

Responsibilities included survey of properties current use and potential uses, recommended use and beautification alternatives. Provided other assistance in developing plans, sales contracts and supervising installation.

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1949-1958

Emphasis:
-Agricultural Education (youth and adult)

(8 year resident assignment in Seminole, Texas)

**Head of the Department of Vocational Agriculture/ Teacher Seminole Public Schools, Seminole, Texas.**

Responsibilities included managing the department's academic facilities, laboratories, shops, 640 school-owned irrigated and rainfed teaching farms; teaching vocational agriculture classes to high school students and adults; planning and supervising youth activities including the Future Farmers of America Chapter, livestock shows, trips, rodeos and other activities.

1948-1949
Emphasis:
-Soil Conservation Services
-4-H Club, Youth programs
-Agricultural Extension Services

Gaines, Tarrant and Floyd Counties, Texas

**Farm Planner, USDA Soil Conservative Service, Assistant County Agricultural Agent - 4-H Club advisor.**

Responsibilities included: 1) preparing farm plans, land use alternatives, providing technical assistance to farmers relative to crops and livestock production and marketing activities; and 2) planning and supervising 4-H Club/youth activities.

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