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MID-TERM EVALUATION OF AGRICULTURAL TECHNOLOGY TRANSFORMATION (ATT) PROJECT (527-0282)

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ABBREVIATIONS AND ACRONYMS

LISTA DE ABREVIATURAS Y SIGLAS

AID	Agency for International Development (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 (Proyecto de Política Agraria y Desarrollo Institucional)
APRA	Alianza Popular Revolucionara Americana (American Popular Revolutionary Alliance)
ATG&T	Agricultural Technology Generation and Transfer System (Sistema de Generación de Tecnología Agrícola y Transferencia)
ATT	Agricultural Technology Transformation Project (Proyecto de Transformación de Tecnología Agrícola)
BAN	Biblioteca Nacional Agraria, UNALM (National Agrarian Library,UNALM)
BAP	Banco Agrario del Perú (Agrarian Bank of Peru)
BS	Bachelor's degree of Science (Licenciatura en Ciencias)
CARE	Cooperative for American Relief Everywhere (Cooperativa Americana para la Asistencia en todo lugar)
CAU	Cooperativa Agraria de Usuarios (Agrarian Cooperative of Users)

CD/ISIS	An FAO bibliographic computer program (programa computarizado bibliográfico de la FAO)
CDSS	Country Development Strategy Statement (Declaración de Estrategia de Desarrollo del Pais)
CDINFOR	Centro de Documentacion Forestal (Forestal Documentation Center)
CDR	Centro de Desarrollo Rural, MINAG (Rural Development Center, MINAG)
CEAC	Centro de Estadística y Análisis Económico, ONA (Statistical and Economic Analysis Center, ONA)
CENCIRA	Centro Nacional de Capacitación e Investigación en Reforma Agraria (National Training and Research Center in Agrarian Reform)
CIAT	Centro Internacional de Agricultura Tropical (International Center for Tropical Agriculture)
CICAP	Centro para la Investigacion y Capacitacion de Chiclayo (Research and Training Center of Chiclayo)
CIMMYT	Centro Internacional de Mejoramiento de Maíz y Trigo (International Wheat and Corn Improvement Center)
CIP	Centro Internacional de la Papa (International Potato Center)
CIPA	Centro de Investigación y Promoción Agraria, INIPA (Center for Agricultural Research and Extension, INIPA)
CNA	Confederación Nacional Agraria (National Agrarian Confederation)
CNPA	Comité Nacional de Productores de Arroz (National Committee of Rice Producers)
CODESE	Comité Departamental de Semillas (Departmental Seed Committee)
CONCYTEC	Consejo Nacional de Ciencia y Tecnología (National Council for Science and Technology)

CONFIEP	Confederación Nacional de Instituciones Empresiariales Privadas (National Confederation of Private Enterprise Institutions)
COP	Chief of Party (Jefe del Equipo)
COTESU	Cooperacion Tecnica Suiza (Swiss Technical Cooperation)
CRSP	Collaborative Research Support Program (Programa Colaborativo de Apoyo a la Investigacion)
CS	Coordinador de Semillas, INIAA (Seed Coordinator,INIAA)
CTT	Coordinador de Transferencia de Tecnología, INIAA (Technology Transfer Coordinator, INIAA)
CTTA	Communications for Technology Transfer in Agriculture Project (Proyecto de Comunicaciones para la Transferencia de Tecnología Agricola)
DAS	Departamento de Accion Social (Social Action Department)
DDT	Departamental Degree Training (Licenciatura en Capacitación Departamental)
DEP	Departamento de Economía y Planificación, UNA (Economics and Planning Department, UNA)
DG	Director General (General Director)
DGPIST	Direccion General de Proyeccion de Investigacion y Servicios Tecnicos, INIAA (Office of Research Projection and Technical Services, INIAA)
DRAT	Departamento de Riego, Avenamiento y Tierras, UNA (Land, Irrigation, and Drainage Department,UNA)
ECASA	Empresa Comercializadora de Alimentos, S.A. (Food Trading Enterprise)
EDAP	Equipo de Desarrollo Agropecuario de Cajamarca (Agricultural Development Team of Cajamarca)

EEA	Estación Experimental Agraria, INIAA (Agricultural Experimental Station, INIAA)
ENCI	Empresa Nacional de Comercialización de Insumos (Monopolio estatal de comercialización, importaciones de alimentos y distribución) (National Input Marketing Company)
ENNSA	1984 Encuesta Nacional de Nutrición y Salud (1984 National Nutrition and Health Survey of Peru)
ESF	Economic Support Fund, AID Fondo de Apoyo Económico AID
ETTASA	Empresa de Transferencia de la Tecnología, S.A. (Technology Transfer Enterprise, S.A.)
FONAGRO	Fondo para el Desarrollo Agropecuario (Agricultural and Livestock Development Fund)
FPP	Federación de Parcelarios del Perú (Peruvian Plot Owners Federation-plots distributed from the Agraria Reform Cooperatives)
FRES	Fondo Rotatorio Especial de Semillas (Special Rotating Seed Fund)
FSR&E	Farming Systems Research and Extension (Investigación y Extensión en Sistemas de Produccion)
FUNDEAGRO	Fundación para el Desarrollo del Agro (Agriculture Development Foundation)
FUNDEAL	Fundación para el Desarrollo del Cultivo Algodonero (Foundation for the Development of Cotton Cultivation)
FUNDETRIGO	Fundación para el Desarrollo del Trigo (Foundation for Wheat Development)
FUNSIPA	Fundación de Servicios a la Investigación y Promoción Agropecuaria (Foundation for Services to Agricultural Research and Promotion)
FDA/UNALM	Fundación para el Desarrollo Agrario/UNALM (Agrarian Development Foundation of UNALM)
GDP	Gross Domestic Product (Producto Bruto Interno)

GNP	Gross National Product (Producto Bruto Nacional)
GOP	Government of Peru (Gobierno del Perú)
IARC	International Agricultural Research Center (Centros Internacionales de Investigación Agropecuaria)
IBRD	International Bank for Reconstruction and Development (Banco Internacional para la Reconstrucción y Desarrollo)
ICE	Instituto de Comercio Exterior (Foreign Trade Institute)
IDB	Inter-American Development Bank (Banco Inter-Americano de Desarrollo)
IDRC	International Development Research Center, Canada (Centro de Investigacion en Desarrollo Internacional, Canada)
IESC	International Executive Services Corps (Cuerpo Internacional de Servicios Ejecutivos)
IIT	Intensive Impact Training (Capacitación de Impacto Intensivo)
INAF	Instituto Nacional de Ampliación de la Frontera Agrícola (National Institute for Agriculture Frontier Expansion)
INDDA	Instituto Nacional de Desarrollo Agro-industrial (National Institute for Agro-industrial Development)
INIAA	Instituto Nacional de Investigación Agraria y Agro-industrial (National Institute for Agricultural and Agro-industrial Research)
INIPA	Instituto Nacional de Investigación y Promoción Agropecuría (National Institute for Agricultural Promotion and Research)
INP	Instituto Nacional de Planificación (National Planning Institute)

IPAE	Instituto Peruano de Administración de Empresas (Peruvian Institute of Business Administration)
IPM	Integrated Pest Management (Manejo Integral de Pestes)
IRR	Internal Rate of Return (Tasa Interna de Retorno)
IRRI	International Rice Research Institute (Instituto Internacional de Investigación del Arroz)
ISNAR	International Service for National Agricultural Research (Servicio Internacional para la Investigación Nacional de Agricultura)
IVITA	Instituto Veterinario de Investigaciones Tropicales y de Altura, UNMSM (Veterinary Institute for Tropical and Highland, UNMSM)
LOP	Life of Project (Vida del Proyecto)
M&E	Monitoring and Evaluation (Revision y Evaluacion)
MEF	Ministerio de Economía y Finanzas (Ministry of Economy and Finances)
MIAC	Mid-America International Agricultural Consortium (Consorcio Mid-Americano Internacional de Agricultura)
MINAG	Ministerio de Agricultura (Ministry of Agriculture)
MS	Master's degree of Science (Magister en Ciencias)
NARCs	National Agricultural Research Centers (Centros Nacionales de Investigación Agropecuaria)
NCBA	National Cooperative Business Association (Asociación Nacional de Negocios Cooperativos)
NCSU	North Carolina State University (Universidad Estatal de Carolina del Norte)

NGO	Non-governmental Organization (Organización No-gubernamental)
NRP	National (commodity) Research Programs (Programas Nacionales de Investigación de Productos)
NRSP	National Research Support Programs (Programas Nacionales de Apoyo a la Investigación)
OARD	Office of Agriculture and Rural Development, AID (Oficina de Agricultura y Desarrollo Rural,AID)
OAS	Organization of American States (Organizacion de Estados Americanos)
ONA	Organización Nacional Agraria (National Agrarian Organization)
PAT	Proveedor de Asistencia Técnica (Technical Assistance Provider)
PhD	Doctor of Philosophy degree (Doctor en Filosofia)
PIST	Dirección de Proyección de Investigación y Servicios Técnicos de INIAA (Office of Research Projection and Technical Services, INIAA)
PLAN MERIS	Proyecto de Desarrollo para la Irrigación Pequeña y Mediana en la Sierra (Sierra Small and Medium Irrigation Development Project)
PL480	Public Law 480, USA (Ley 480 de E.E.U.U.)
PLOS	Project Linked Observation Study (Estudio de Observacion ligado a un Proyecto)
PM	Person Month (Persona al mes)
PNUMA	Proyecto de las Naciones Unidas para el Medio Ambiente (United Nations Project for the Environment)
PPM	Agricultural Production, Processing and Marketing System (Sistema de Producción, Procesamiento, y Mercadeo Agricola)

PR	Public Relations (Relaciones Públicas)
PRATEC	Proyecto Andino de Tecnologia Campesina (Andean Project of Peasantry Technology)
PRISMA	Proyecto de Informatica, Salud, Medicina y Agricultura (Information Management, Health, Medicine and Agriculture Project)
PROSEM	Programa de Semillas, INIAA (Seed Program, INIAA)
PVO	Private Voluntary Organization (Organización Voluntaria Privada)
PY	Person Year (Persona al Año)
RD&E	Research, Development, and Extension (Investigación, Desarrollo, y Extensión)
REE	Research, Education, and Extension Project (Proyecto de Investigación, Educación, y Extensión)
SEINPA	Servicios de Investigacion en Papa, COTESU (Potatoe Research Services, COTESU)
SINAMOS	Sistema Nacional de Apoyo a la Movilización Social (National System of Support to Social Mobilization)
SNIDA	Sistema Nacional de Información Documental Agraria (National System of Agrarian Documental Information)
SUTEP	Sindicato Unico de Trabajadores de Entidades Públicas (Labor Union of Public Entities)
SOW	Statement of Work of Midterm Evaluation Team (Terminos de Referencia del Grupo Evaluador de Medio Término)
S&T/AGR	Science and Technology Bureau, Office of Agriculture (Oficina de Agricultura, Agencia de Ciencia y Tecnología, AID/W)
TA	Technical Advisor (Asesor Tecnico)

TT	Technology Transfer (Transferencia de Tecnología)
UAD	Unidad Agraria Departamental, MINAG (Departamental Agricultural Unit, MINAG)
UNALM	Universidad Nacional Agraria - La Molina (National Agrarian University - La Molina)
UNC	Universidad Nacional de Cajamarca (National University of Cajamarca)
UNMSM	Universidad Nacional Mayor de San Marcos (National University Mayor de San Marcos)
UNPRG	Universidad Nacional Pedro Ruiz Gallo (National University Pedro Ruiz Gallo)
USEFA	Unidad de Servicios de Extensión y Fomento Agropecuario, MINAG (Agricultural and Livestock Development Extension Services Unit, MINAG)
US	United States (Estados Unidos de Norteamerica)
USG	US Government (Gobierno de los E.E.U.U.)
USIS	US Information Service (Servicio Informativo de los E.E.U.U.)

PROLOGUE

This evaluation was undertaken by the Development Economics Group of Louis Berger International, Inc (LBII) under contract Number PDC-0085-I-00-9060-00, Delivery Order No. 10. The Scope of Work is presented in annex to the report. The evaluation team members and their respective responsibilities were:

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The evaluation took place over a period of five weeks, from June 4, to July 6, 1990. During the first week the team members attended a series of presentations and group questions and answers sessions at each of the institutions participating in the project, chronologically NCSU/MIAC, ONA, INIAA, UNA, and FUNDEAGRO (see list of acronyms for definitions). During the second week the team members conducted one-on-one interviews with project personnel and officials. The third week, the team visited project sites and conducted interviews of field personnel in the following locations: Piura, Chiclayo, Cajamarca, Ica, Canete, Chincha, Huaral, Arequipa, Iquitos and Cuzco. Names and affiliations of people interviewed in the course of the evaluation are annexed to this report. The last two weeks were spent conducting additional interviews, presenting the evaluation's conclusions to USAID and the participating institutions and incorporating their comments, and preparing this evaluation report. Throughout this period, the evaluation team consulted a large amount of documents the list of which is also annexed. We wish here to express our thanks to all the people who did not spare any time or efforts to answer our queries and address our sometimes harsh criticisms, at USAID, FUNDEAGRO, INIAA, UNA, ONA, NCSU/MIAC and otherwise. The authors of this report however, remain solely responsible for its contents.

EXECUTIVE SUMMARY

As evidenced in this report, the Agricultural Technology Transformation project (ATT) will only produce a few of the outputs originally forecast in the Project Paper, independently of the decisions to be taken at this stage. This situation has been brought about by a number of factors which are listed below:

- the catastrophic economic situation in Peru which has prevailed for the last two years;

- the reduction of the original budget by at least 1/2 due to the almost total absence of counterpart funds and the unadapted disbursement system;

- the low level of participation by key Government of Peru agencies, principally the Ministry of Economy and Finance which did not assign any funds to cover INIAA's operating costs, the Ministry of Agriculture because its extension system is basically inoperative, and UNA which joined the project two years late;

- the ever increasing security problems prohibiting access and work in many areas in the country;

- severe design faults, principally in the project's implementation arrangements, and private sector development strategy;

- overblown and complex objectives fixed in the original design, inconsistent with the limited resources available;

- the involvement of an unusually large number of individuals and institutions many of whom have a long history of involvement in agricultural technology generation and transfer in Peru, whose interests and conflicts transcend the specificity of the project, combined with insufficient and guidance by USAID/Peru, principally at the design stage;

Against this rather negative background, the evaluation points out to some impressive achievements under the circumstances, and to the dedication and talents of many individuals involved in the realization of the project.

Another important aspect governing this evaluation is that matters such as the unpaid debt owed by the Government of Peru and US narcotics policy will have much stronger implications in the coming years than the merits of this project. Our most important conclusion in this respect is that ATT is not an appropriate vehicle to promote the objectives of US narcotics policy.

The evaluation team has attempted to actively involve all the project's institutions in the evaluation process, in an effort to maximize the applicability of the conclusions and recommendations presented below.

Activities Ia and Ib Consolidation and Integration of INIAA Research Program, Strengthening INIAA Administration and Management

The last 10 years of USAID experience that direct support to INIAA does not promote focused agricultural research, but instead contributes to an ever expanding institution. ATT's main thrust has not been supported by INIAA. INIAA however, remains the leading agricultural research institution in the country.

Direct contributions to INIAA should be stopped, irrespective of debt sanctions. The project should continue to support research at INIAA by opening the competitive grants program.

Activity Ic Expanding Research Opportunities

The concept and overall execution of the competitive grants program within ATT are sound and well executed. This program offers a unique potential to promote quality in agricultural research and efficiently address the recurrent problem of the politization of appointments.

The competitive grants program should be continued and protected by adequate safeguards. Its linkage to extensionists should be strengthened.

Activity IIa Establishing Technology Transfer Specialist Program

The MINAG system originally considered proved inadequate for lack of counterpart funds. While some valuable methodologies such as CTTA have been applied with ATT support, the program itself will have little impact in the absence of a comprehensive understanding of extension in Peru. This conclusion raises the more fundamental question of the validity of supporting research in the absence of transferring mechanisms.

ATT should conduct an in-depth study of extension in Peru, analyzing existing systems and potential linkages with them. A technology transfer strategy whether under ATT or under a different project should then be developed.

Activity IIb Stimulation of private Sector Technology Transfer Activities

The impact of this activity will probably be minimal. The design underestimates the true capabilities of the Peruvian private sector

and does not include any consideration of the business environment in the country. Uncompetitive procedures followed in the selection of businesses raise the specter of clientelism. Finally, the quality of the technical assistance given to enterprises is poor.

This component will probably have minimal impact. The activities under this component, with the exception of ONA's CAEC and farm management services should be stopped immediately, at least until a clear definition of objectives and methods has been established.

Activity II c Stimulating an Improved Seed Production Distribution and Certification System

The development of Departmental Seed Committees is one of the valuable activities undertaken by ATT, however much remains to be done for this system to be sustainable, were it only in one location. The support to private sector seed companies suffers from the same conceptual and execution problems ~~than~~ as those of activity IIb.

The continuation of this activity should be concentrated exclusively on the seed committees already established, until they have become self sustaining. All activities supporting selected private companies should also be suspended.

Activity IIIa Strengthening UNA Administration and Teaching Program

Although this activity has only recently started its achievements to date appear promising, particularly in the area of curriculum development. The committee system implemented by UNA appears the only way for the process to take place. The design did not foresee the complexity of the task.

The activity should continue under its current format. Additional funding may become necessary and provisions should be made in this respect. To avoid misuse of the system, incentives for participation in committees should be limited to two committees, irrespective of the actual number of committees one is a member of.

Activity IIIb Improving Research, Teaching and extension Materials

The development of a library at UNA is a valuable enterprise but it cannot be achieved with ATT support only. The existence of a scientific journal is essential to sustain the impact of research and UNA's journal is the most appropriate. Its editorial board however must represent the variety of interests within ATT. Other activities included under this component, require interinstitutional collaboration which has not been forthcoming in the past.

The limited activities supporting the library at UNA should continue, but their expansion should be subject to the obtention of sizeable funding from other sources. UNA's journal should be supported if and only if its editorial board includes representatives from INIAA and FUNDEAGRO. Support to other ventures should be postponed until such time interinstitutional collaboration becomes possible.

Activity IIIc Competitive graduate Study Fellowships and Participant Training

The selection of students both for in-country and off-shore training has been well adapted to ATT goals. Systems in place provide effective protection against abuse. In-country training, not included in the design, is a valuable alternative to off-shore training.

In country training should be included in this activity. Otherwise, it should continue with minor adjustments spelled out in the report.

Implementation Arrangements and Institutional Analysis

Implementation arrangements designed in the project paper have proven to be a severe constraint to ATT success. The design of the project has entrusted 80% of the funding to participating institutions to FUNDEAGRO. However USAID guidelines concerning adequate management systems were not applied to this essentially new institution. In addition many of the funds to FUNDEAGRO were only supposed to pass through, despite the fact that this kind of arrangement had previously been proved unadapted to the Peruvian context.

Implementation arrangements need to be entirely revised, effectively discriminating funds according to their final destination, and providing for tight and sustained USAID control.

FUNDEAGRO management has demonstrated unwillingness and incompetence in applying US Government regulations in the area of financial management. The Contractor, NCSU/MIAC, could or would not successfully execute its advisory responsibility in this respect. Finally, despite the fact that it had correctly identified much of the problem soon after project inception, USAID/Peru has been slow at applying corrective measures.

In the course of this evaluation, the Board of Directors of FUNDEAGRO has indicated and demonstrated a strong willingness to address the problems faced by the institution. Based on this premise, FUNDEAGRO should continue to participate in this project, provided its Board takes active participation in the implementation of a new management structure and systems. If this is not possible, this project should be terminated.

While the other non-public participating institutions appear adequately managed, surveys of their management systems should be undertaken prior to any substantial increase in funding.

Other Findings and Conclusions

The project has also suffered from the general state of affairs in Peru. The three salient ones are the current inability of the GOP to provide operating budgets to the agricultural sector, the policy environment which is not propitious to agricultural development, and the inadequacy of US Treasury disbursement mechanisms to the inflationary conditions in existence in Peru. There is no doubt that the absolute impact of these constraints, which already existed at the time of design, has significantly affected this project.

Any activity funding a GOP institution must include the demonstration of the ability of GOP to provide counterpart funds. This is not likely to be true in the agricultural sector until the end of this project. Any activity supporting private sector development must ensure the policy environment is favorable.

ATT has failed to take into account existing conditions developing in Peru during project implementation. Instead of decreasing the number of activities, project execution sought to increase them, while lowering the overall quality of the results.

By limiting the activities to the competitive grants program, Departmental Seed Committees, curriculum development, the scientific journal and the scholarship program, the project would be sheltered from the constraints stemming from the GOP. The current US assistance funds disbursement problem however must still be solved to achieve a significant impact.

BACKGROUND

ATT seeks to promote technology generation and transfer to Peruvian farmers through a combination of four public and private institutions. The public institutions are represented by the Instituto Nacional de Investigación Agropecuaria y Agroindustrial (INIAA), and the Universidad Nacional Agraria "La Molina" (UNA). The private sector institutions are the Organización Nacional Agraria (ONA) and the Fundación para el Desarrollo del Agro (FUNDEAGRO). ATT attempts to strengthen and expand the programs of each individual institution, and to promote coordinated action in areas in which ATT objectives are common to all four institutions.

This mission is defined to a great extent as an effort to correct a series of problems commonly attributed to the agrarian reform carried out under the military government of Velasco Alavarado (1968-75). These problems include declining production and productivity in many areas of agriculture, a deteriorated capacity to conduct agricultural research and education, and a lack of private sector investment needed to make agriculture responsive to changing market conditions. In fact, while the agrarian reform did suffer from an overly centralized, authoritarian implementation style and an inadequate understanding of the forms of rural property it sought to transform, it was itself the victim of a policy environment hostile to a large portion of the agricultural sector.

The institutions created by the military suffered from two essential weaknesses. On the one hand, once the changes in rural property relations that the agrarian reform signalled had begun the state created institutions were unable to respond swiftly or fully to the popular expectations that had been created. Ultimately, they came to act as a brake on the social processes that the military had either set in motion or legitimated. Second, while the agrarian reform did put a formal end to the hacienda system, which had been in a period of decline for some time, it did not resolve the conflicts between competing class interests within the agricultural sector. Instead, it tried to subsume them within state institutions, where they were to be mediated within a framework of state-controlled technocratic decision making. The result was that agrarian reform institutions represented a "lowest common denominator" approach, in which no one was satisfied. Thus, the institutions created under the military to represent rural interests had a tendency to fragment according to the specific interests of different sectors of their membership. In some cases, this fragmentation was closely tied to the activities of particular political parties, which saw one or another sector of the rural population as an actual or potential constituency.

While the agrarian reform irrevocably changed rural property relations in Peru, it did not address a range of policy issues

which had created an increasingly unfavorable climate for agricultural production for several decades. The practice of import subsidies was continued and expanded, retail food price controls were strengthened, and patterns of public investment in infrastructure to favor export industries on the coast were perpetuated. As a result, the crisis in the agricultural sector which had generated the pressures culminating in the agrarian reform continued with the major difference that the state, rather than landlords, now monopolized access to land, inputs and other key resources for agricultural production.

The costs to the state to maintain this apparatus were enormous, and it was unable to continue supporting many of the institutions it had created. Beginning in the Morales Bermúdez government, agrarian reform structures began to be dismantled and much rural property began to return to private hands. This process was accelerated under the Belaúnde government, which was elected in 1980 and held power until 1985, when the present outgoing government, of Alan García was elected. Former landowners were allowed to reclaim parts of the properties that had been expropriated under the agrarian reform; lands adjudicated to state-created cooperatives were in many cases divided as individual holdings among the cooperative members, with the cooperatives retaining only limited functions in areas such as commercialization and input purchase; and committees of private producers reappeared.

ATT sought to take advantage of the devolution of state institutions and responsibilities to private hands to promote conditions in which the private sector would take greater responsibility for investing in agricultural development. This was defined in terms of creating the institutional arrangements and financial incentives needed to encourage private investment in research and other agricultural support services. Parallel to this process, ATT sought to make public institutions responsible for research and education more responsive to private sector needs and priorities. Rather than altering property relations by decree, or lobbying for global changes in agricultural policy, ATT sought to institutionalize a technocratic or "science-based" approach to agriculture through this partnership of public and private entities. Some hoped that such an effort would result in a groundswell of support for a more favorable policy environment based on technical considerations.

MAIN FINDING AND CONCLUSIONS

I. PROJECT ACTIVITIES

The Agricultural Technology Transformation (ATT) project is composed of three components divided into three activities apiece. This section summarizes ATT progress to date, and the evaluation team's recommendations.

Component I, **Technology Generation** seeks to strengthen agricultural research systems in Peru.

Activities Ia, **Consolidation and Integration of INIAA Research Program** and Ib, **Strengthening INIAA Administration and Management**, both support public sector research at the Instituto Nacional de Investigacion Agraria y Agroindustrial (INIAA). Their main thrust in the original design was to focus Peru's very limited research resources on relevant adoptable technologies. Originally, this component was to support a total of 15 research programs: 8 national crop/ecological zone programs, one livestock program and 6 national research support programs (NRSPs). In fact under ATT the number of research programs increased to 25: 13 crop research programs, 2 agroindustrial, 1 forestal, 5 livestock and 4 NRSP. In addition, INIAA reports another 4 research programs presumably funded by other donors. The research programs are further divided into about 1300 research projects, themselves divided into experiments.

The increase in programs coincided with a decrease in INIAA funding. Since 1988, ATT support to INIAA for operating costs, which represented 90% of total operating costs, has averaged around $1 million per year. This contrasts sharply with the $7 million per year INIPA received from AID, the World Bank and IDB combined during the period 1981 to 1986. Accompanying this drastic cut in foreign aid, the Government of Peru (GOP) disbursements to INIAA for items other than salaries were reduced to a trickle -- $53,000 in 1989, and $12,500 for the first 5 months of 1990.

As a result of this dispersion of limited funds over a broad spectrum of research programs, the quality and relevance of research has certainly been impaired. Experiments on farmers' fields are rare, and the infrastructure of research stations (EEAs) is minimal. For example two EEAs visited by the team did not have access to regular water supply although they each had been doted with rather expensive equipment under REE: (an atomic absorption spectrophotometer in Chiclayo and a tissue culture laboratory in Iquitos). Also, INIAA's staff in Cuzco had to take refuge in the football stadium because the rent for the city office went unpaid.

Yet these dramatic budget cuts have not affected the size of INIAA's payroll. Following a recent presidential decree, INIAA

staff actually increased by about 1000 employees, when all contract employees were appointed to permanent positions.

On the other hand, the evaluation team was impressed by the competence and dedication of many INIAA professionals, and by their ingenuity enabling them to continue work in the EEAs. In fact INIAA remains today the leading institution in agricultural research in Peru, and still disposes of a substantial corps of qualified professionals.

According to historical data, funds allocated to research represent some 50% of INIAA's expenditures. The rest goes to administration and training. Based on evaluators' estimates, an average INIAA research project today receives $430 per year for equipment, transport, inputs etc. In the US, this would only cover the cost of seed and chemicals necessary to grow a single acre of corn. By contrast, FUNDEAGRO (Fundación para el Desarrollo del Agro - see activity Ic below) has budgeted an average of $6000 per research project per year, while the Small Ruminants Project CRSP budgets $4000. Under the current funding situation, INIAA would have to reduce the number of its projects from 1300 to about 150 to achieve the same budget levels as CRSP's competitive grants program. This is 2 to 3 times lower than the target figure of 300 to 400 programs quoted by INIAA management.

Peru is under debt sanctions; and unless the new GOP takes immediate action, it is very unlikely that future funds will be available to INIAA next year, except insofar as INIAA research serves to combat drug trafficking. But the evaluation team deems that INIAA agricultural research would have at best an indirect effect on drug issues. Thus, the only available option is to channel funds to INIAA through FUNDEAGRO or other private sector organizations participating in ATT.

As discussed below, ATT activities IIb, IIc and IIIb, have been rated the most expendable under this project if funding is tight. The total budget available from these would be of about US$ 1,000,000 per year. Adding this to current funding levels, the maximum support ATT could give to INIAA would be $2,000,000 per year, enough for roughly 200 programs.

This option is not recommended however. INIAA has failed to focus its research program, although this has long been recognized as essential (see for instance the ATT Project Paper, the REE final report and the REE evaluation), and was one of the main objects of ATT activities Ia and Ib. Experience during the last 10 years clearly demonstrates that direct funding to INIAA systematically encourages the scattering of research objectives instead of focussing it. In addition, the GOP is currently unable to provide its institutions in the agricultural sector with basic facilities, thus forcing the donor agencies to support their entire operation.

USAID should thus look for alternative ways to support the participation of INIAA in agricultural research in Peru.

Activity Ic, **Expanding Research Opportunities** aims at developing additional lines of research not supported by the public sector, strengthening the quality of researchers by creating the necessity for well conceptualized research proposals, and enabling more research to take place in institutions other than INIAA. Financed by FUNDEAGRO, this research would also more specifically address the requirements of the Peruvian private sector. The activity is undertaken through a competitive grants program open to all investigators in the country.

ATT has been successful in creating a professional Research Proposal Evaluation Group (GREPI). To date 107 projects have been selected out of 341 proposed. Seventy six are currently in execution in 24 institutions, in fields considered as priority within the project. The major problem registered to date stems is that budgets are prepared in nominal Intis and loose their value at an alarming rate. Another problem is the preapproval of expenditures by FUNDEAGRO's administrative echelons, where occasional highly arbitrary cuts have been made prohibiting the purchase of necessary materials for research. Some questions have also been raised concerning the quality of the selection criteria system.

Overall, this evaluation finds the competitive grants concept and its general application within ATT to be sound and well executed. This program offers a unique potential to promote quality and to minimize political considerations in agricultural research. It must however be equipped with strong safeguards, many of which are already in place. First the continued presence of at least one US technical assistant and one AID mission representative as voting members of GREPI is imperative. In addition, while veto power is not necessary, no research can be funded if the proposal hasn't been rated by AID's representative. Second payments must be made directly to the researcher, while an allowance of up to 20% can be permitted to cover overhead and use of the institutions facilities. Third GREPI's composition and the selection criteria should be reviewed to ensure all fields are adequately represented. Fourth GREPI should be given full authority by FUNDEAGRO to select proposals and to decide on their budget. The role of FUNDEAGRO's staff should be strictly restricted to setting overall budget, administration of funds and follow up of research progress. It is recommended that for a learning period the core of GREPI consisting of a representative from FUNDEAGRO, AID and the Research technical assistant resolves differences on budget interpretation between researchers and FUNDEAGRO. Sixth the quality of the competitive grants program should be regularly reviewed by an independent evaluator. Finally, the program should be accompanied by a series

of courses designed to strengthen researchers capabilities in proposal preparation and statistical analysis.

In the case direct support to INIAA was to come to an end as described above, the conditions for eligibility of INIAA's researchers in the competitive grants program should be relaxed. At present, INIAA researchers cannot submit proposals in fields included in INIAA's national research programs since the latter are already financed under activity Ia. If direct funding to INIAA were to stop, all proposals from INIAA should be considered, and judged strictly on their merits. As further explained under activity IIa, GREPI should consider with particular interest any proposals where INIAA's research plans stem from extension diagnostics. It should be emphasized that since every dollar financed under this competitive grants program goes directly to research while support through ATT activities Ia and Ib is split between research and administration, this system should also significantly increase the impact of US assistance in addition. In addition, if competitive grants become a major source of income for INIAA, the likelihood that appointments will be made according to professional capabilities will greatly increase, since INIAA will need such professionals to survive. Until now, given the patterns of decision making for donor funding, this was not necessary.

The major risk with this option is the appropriation of funds by the administration of the institution where the research takes place, before they get to the researcher. A system should be designed whereby the money is granted directly to the researcher, who would assume responsibility. The system should permit that a certain portion of the grants (around 20%) could be paid to these administrations, recognizing the use of their facilities.

ATT must also beware of not damaging this still fragile activity by giving it too much funding. The emphasis must remain on quality research, and obligated amounts should be considered as ceilings as opposed to targets. It should be understood at all levels that the deobligation of funds at the end of a fiscal year may signal success by GREPI in preserving its independence.

As part of Activity Ic, it is also planned that FUNDEAGRO will support the National Agricultural University UNA in developing lines of research deemed important (farm management; irrigation, drainage and soil/water conservation; agricultural mechanization; transportation and marketing economics). Due to the non participation by UNA in the project until the last quarter of 1989, this subactivity has not started yet. Given the complexity of the project and the serious implementation difficulties experienced to date, and serious frictions between the two institutions, it is recommended that this subactivity be carried out with caution if at all. Specifically the criteria for developing these lines of research be clearly established between UNA and FUNDEAGRO, as

demonstrated by a comprehensive letter of agreement, prior to the release of funds.

Component II, **Technology Transfer** was designed to strengthen technology transfer in the public sector, in the private sector and in embodied technology (seeds).

Activity IIa, **Establishing Technology Transfer Specialist Program** strengthened technology transfer specialists (TTS) who were to act as a link between INIAA's researchers and the Ministry of Agriculture (MINAG) extension agents and encourage linkages of research with other interested parties. This activity was developed while MINAG had no resources available to finance its operating costs. In addition, the morale and quality of extension agents has been affected by what is considered a continuous downgrading of extension agents. In three or four years these will have been employees of INIAA, then MINAG, and soon of the new regions created under the regionalization law. As a result, extension agents have either left MINAG or are sitting idly, save a few exceptions. The technology transfer specialists thus were not able to link INIAA research with extension agents, at least not those of MINAG.

Under the Direction of Research Projection and Technical Services (PIST), a corps of some 52 TTS (55 were programmed) has been created at INIAA. Thirty four them are actually involved in technology transfer in the conventional sense. Partly because of the situation which developed at MINAG many of these specialists were redirected to cooperate with the Communications for Technology Transfer in Agriculture Project (CTTA) which was expanded to twelve EEAs.

CTTA appears to be a valuable methodology for technology transfer in agriculture and has been partially institutionalized in some sites. Yet it is only one of the means for transferring agricultural technology to Peruvian farmers. Thus it is not representative of all avenues available to ATT to transfer research to farmers and to communicate farmers needs to researchers. In fact, there exists no source of information which can provide a comprehensive picture of extension services in Peru and of their linkage potential with ATT. Until this information becomes available, the lack of linkage observed between research and extension seems unavoidable.

It is recommended that an in-depth study of extension in Peru be undertaken in order to assess how technology transfer systems in place in Peru and assess future potentialities. Based on these results, ATT should design a strategy to integrate its research with the most effective extension service. This may be on a crop or regional basis, depending on the circumstances. The study would also consider how the coordination between CTTA and existing extension systems (farmer groups, NGOs, etc) could be strengthened.

The TTS should promote this link by seeking the most efficient extension system(s) for their region, and encourage researchers to conduct "transferable" research. A great incentive in this respect would be to increase the factoring of this aspect in the selection of research proposals under activity Ic.

The recommendation to stop direct funding to INIAA applies to this activity as well. INIAA has not been more efficient in providing funds for technology transfer than for research. In the future, funding for CTTA and other extension services could be provided by redirecting the funds under this and component IIb, on a truly competitive basis, by contracting for specific extension activities aimed at solving identified problems with validated solutions.

The other TTS are "seed specialists", mostly involved in the production and distribution of foundation seed. In areas where Departmental Seed Committees exist, they perform the linkage function between INIAA and the committee.

Because it links with the development of the Departmental Seed Committees further support to the seed specialists could justifiably be channelled through Component IIc on a temporary basis. However, proceeds from the sale of foundation seed should soon cover the costs linked to this activity.

Another subactivity included under IIa was to develop cooperative arrangements for stimulating technology transfer by producer associations, agribusinesses and consulting firms. Such arrangements, formal or informal, have long been common practice between INIAA and a number of institutions, producers associations, universities, NGOs, agribusinesses and cooperatives. it is impossible to assess any results specific to ATT in this respect.

Activity IIb, **Stimulation of Private Sector Technology Transfer Activities** proposed to establish or support private technology transfer enterprises. Since 6 letters of agreement have been signed and the Project Paper called for 10 new enterprises to be developed, this activity is apparently reaching its numerical target. However, the non-competitive procedures followed in the selection of many of these enterprises, and the overall lack of professionalism in the conduct of this activity makes it appear that unless some serious changes take place it is very unlikely that any sustainable results will be produced.

An interesting feature of the section in the project paper describing this activity (pp 53 to 56) is that while it is stated that "the potential for private sector involvement in technology transfer is enormous" the question of why the private sector isn't taking advantage of this potential is not discussed. Activities to date have been focused on strengthening the managerial and technical capabilities of selected enterprises. The implicit

answer to the question posed in this paragraph thus seems to be that the Peruvian private sector does not enter the technology transfer business because it doesn't know how to.

First, this may be underestimating the acumen of Peruvian businesspeople. Second, it ignores the extremely difficult business environment in particular state control, and wild changes in absolute and relative price levels. Third, it is in contradiction with the fact that for certain crops such as wheat, barley, and export fruit and vegetables private technology transfer does take place. Fourth, because it can only be given to a few, direct assistance to companies has a great danger of ending up in clientelism.

In addition to this strong doubt about the entire thrust of this activity, observations on the quality of the work conducted to date indicate that, even if "Know-How" were the problem, it doesn't seem FUNDEAGRO can provide very much help.

To select promising enterprises FUNDEAGRO at first conducted a seminar on the North Coast describing this activity. It subsequently received proposals from 20 enterprise from which 3 were selected. Each is now receiving technical assistance towards the development of a business, including the realization of a feasibility study. If the study is positive FUNDEAGRO plans to give further management assistance and some equipment some of which would be reimbursable.

In the Central and South Coast, FUNDEAGRO did not request proposals and selected enterprises directly, allegedly after running some screening tests among ONA and the Colegio de Ingenieros membership lists. Unfortunately there were no records available to the evaluation team describing these tests and their results. This is important because FUNDEAGRO plans to assist these firms with grants of personal services and equipment which are called competitive.

Many of the enterprises selected have preexisting lines of activity whether they are farms, production or marketing cooperatives, or input or equipment distributors. No criteria seem to exist linking their current net worth to grant eligibility.

One feasibility study (APALAM) was recently completed. According to FUNDEAGRO the study was "excellent" and the business was definitively feasible. This contrasted with the observations of the team members during the field trip. During an interview with the 12 agronomists who created the company, these indicated that they hoped to gross $1 million per year offering a wide array of services while the study indicates I./ 1 billion equivalent to $70000 (Dec 1989). In this case, as observed with other TTEs, the promoters showed an overall lack of direction.

The feasibility study does not include any risk analysis, a basic requirement for business, especially in today's Peru. FUNDEAGRO personnel responsible for this component did not appear to know the difference between sensitivity (where one analyses the behavior of the results for changes in assumptions) and risk (which is the probability a business may end in bankruptcy).

One finding is that the definition of technology transfer has broadened to the point of including input supply, processing and packing services, and marketing in Peru and overseas. While these are certainly important activities for agriculture, they are definitively outside the scope of this project. When asked about this broadening, NCSU/MIAC personnel indicated that when designed, the project had been arbitrarily limited to nine activities. It should be pointed out that there may have been very good reasons for doing so. Worldwide experience in rural development indicates projects with more than four components have systematically failed because they become unmanageable. Part of the problems identified in this evaluation can be traced to the lack of overall objectives, and to the consideration of activities never included in the project paper.

FUNDEAGRO plans to soon sign agreements of cooperation to grant further technical assistance and possibly equipment to TTEs in the coming year. Though FUNDEAGRO plans to recover most of these costs it has not yet developed guidelines for the financial and general management reports it expects to receive from the said enterprises.

Also under this component, The National Farmers' Organization (ONA) was to provide backstopping services to the technology transfer enterprises and to its constituency, based on the AID supported Economic Analysis and Statistics Center (CEAC). ONA was also to develop some services for which it would charge a fee.

In collaboration with UNA, ONA has developed an interesting concept for a farm management service as a follow-on to its production cost studies. ONA hopes to sell this service to farmers for a $50 fee. Apparently, some 260 have already expressed interest. ONA also conducted several feasibility studies. The one made available to the evaluation team (Estudio de factibilidad de Semilla Mejorada de Papa Presentado a FUNDEAGRO por el Comite Departamental de Productores de Papa-Huanuco) indicates that ONA staff also need training in the basic principles of business analysis. For instance, all the cash flow tables (pp 87 to 95) include unexplained negative cash flows. Finally ONA hopes to receive support in developing the study for a commercialization company specializing in input supply. This, like the other marketing services described above, may be outside the scope of the ATT project.

The institutional analysis points out that ATT should be careful in supporting the development of services within ONA. This

organization was primarily created as a lobbying organization helping commercial farmers in the aftermath of the agrarian reform. While there is strong support for the service orientation within the organization, there is also strong opposition by some who feel it will divert the organization from its original purpose. ATT should be careful not to take sides on this issue.

In conclusion, this component appears to be in disarray. To add to the confusion, its manager at FUNDEAGRO resigned during the time this evaluation took place. It is therefore recommended that all support to private enterprises under this component should be stopped immediately, until such time a clear definition of objective and methods has been established. If this definition demonstrates the validity of the current approach, then a plan for strengthening staff must be drawn, including the participation of personnel with experience in business plan and agribusiness finance. Decisions must be made concerning the FUNDEAGRO personnel involved, at headquarters and in the field.

ONA activities in the CEAC should continue in the meantime. It is recommended that the specialist mentioned above be brought in to analyze ONA's farm management system and to train its analysts in the development of business plans.

Activity IIc, **Stimulating an Improved Seed Production, Distribution and Certification System** proposes to reach its objectives through two distinct lines: the development of a region based seed certification system and the promotion of private sector investment in seed production and diversification.

The seed certification system is centered around Departmental Seed Committees whose membership include MINAG, INIAA, seed companies, seed multipliers, Banco Agrario and farmers. These committees would perform the functions essential to a sound seed certification system including the distribution of foundation seed, inspections in multiplier's fields during the growing season, and testing the seed in laboratories. The development of these committees is supported by FUNDEAGRO through the preparation of manuals, training activities in the form of seminars, short courses and external training and technical assistance by field advisors in the producing areas. The system also envisaged the provision of seed laboratories though their supply has been delayed by problems in commodity procurement.

The development of a seed certification system is one of the valuable activities undertaken by ATT to date. While much remains to be done to consolidate the system, the principle of certification is now well established in Peru. It should be kept in mind however, that the ATT sponsored system is only one among several schemes already in existence in the country. Existing non-ATT certification schemes exist for wheat, barley, and soy beans.

To date, ATT has organized a total of six committees. The team visited three of those, none of which is fully functional.

The departmental committees still need to be reinforced to improve standards. In Chiclayo, the seed companies still conduct the field inspections and the tests necessary to the certification are performed by INIAA. Therefore the Departmental Seed Committee as well as the Ministry of Agriculture currently only rubber stamp this certification. it was also noted that the committee had not met since november and there was no farmer representative. An important reason for the committee seemed to be price setting, which may not always be to the farmer's advantage. In Ica, another committee visited, field inspections were also performed by the seed companies. In any event, the fact that this rubber stamping is important to the producers seems to indicates a need. The committee must thus establish its credibility by conducting the field inspections and seedlot sampling itself, and by improving seed quality, which some felt was too low. This can be promoted through the continuation of ATT assistance and the provision of basic equipment.

It is noted that the concept has shown enough validity that at least one Departmental Seed Committees (Cuzco) has sprung up without support from FUNDEAGRO but based on the model developed under ATT, adapted to the local circumstances.

To promote private sector enterprise participation in the seed business, this activity also proposes to supply selected private sector companies with capital support or equipment. To date this selection only reached the feasibility study level. In the meantime some selected companies have received technical assistance services. However, the field observations by the evaluation team clearly demonstrate that as soon as a window of opportunity exists private capital is readily available for the establishment of seed business. The most striking example is Chiclayo, where at least 3 new companies sprung up in less than two years, at least one of which received no assistance from FUNDEAGRO nor bank loans. Their major motivation was that private trade in rice became legal.

In this activity also, technical capabilities in business development are lacking. The translation of the section on sensitivity analysis of a feasibility study conducted for a seed plan (Representaciones Agricolas M. Villanueva E.I.R.L. page 123) serves to illustrate this point:

> "The high values obtained for all return indicators, principally those pertaining to the discount rates for the calculation of the Internal Rate of Return [sic] make the conduct a sensitivity analysis irrelevant"

Because the future of the Departmental Seed Committees depend mostly on their credibility, it is essential the project focus all

of its efforts on this component on the few committees it assisted thus far. If the next campaign proves successful, FUNDEAGRO can probably move on to support committees that have developed spontaneously whenever they need help. If more resources are available, new committees can be developed in areas where uncertified seed commerce already exists, possibly based on the Plan Chacras.

Concerning the support of private businesses, as in the case of activity IIb, it is recommended that all activity be stopped pending a reconsideration of objectives and a professionalization of services.

Component III,**Human Resources Development**, was designed to strengthen the quality of agricultural research and extension professionals, in order to increase the quality and relevance in this field, and ensure the sustainability of the project in the future. This component was centered around the Universidad Nacional Agraria La Molina (UNALM), Peru's main agricultural university. Because the University only recently agreed to re-enter the project, this component is only at it's inception stage.

Activity IIIa, **Strengthening UNA Administration and Teaching Programs** proposed to strengthen UNALM by improving its management, revising its curriculum, opening the faculty to new alternatives and linking it to the Peruvian and world realities. Since UNA only joined this project 9 months ago, and that work could only begin 4 months later, this activity has not progressed very much yet.

UNA has hired a competent specialist in curriculum development who set up a committee system to undertake curriculum reform. Though complex, this system is likely to be the only appropriate way to undertake such a task given the UNA structure. The major problem is that the project paper underestimated the effort necessary to accomplish a true curriculum reform. Originally this reform was restricted to the M.S. program only. This quickly proved too restrictive and the work has to be extended to other areas.

The evaluation team recommends continuing support of this activity. Progress should be closely monitored in order to permit the rapid injection of additional funding to allow for further work on the reform once positive results have been demonstrated. Careful follow up of the committee system is required, to ensure they are actually producing their outputs, given the monetary incentive system used to promote participation in these committees. However in no case should a person receive compensation for work on more than two committees (although she/he can work on any number of committees).

Activity IIIb, **Improving Research, Teaching and Extension Materials** is a three pronged activity which is to develop the National

Agricultural Library at UNALM (BAN), supporting the creation or reinstatement of an agricultural science journal and increase the publication and dissemination of extension publications.

To date UNALM has developed an ambitious plan for the full modernization of BAN, but the funds necessary to this are not readily available. ATT will provided limited funds for short courses, and computer equipment. While the merits of a well stocked modern library are clear, this project does not have the resources to support such an endeavour. Funding must therefore be obtained before a significant impact can be made. UNALM's progress in the implementation of this task should be monitored carefully before additional funds are committed to this activity.

The discussions concerning an agricultural science publication in Peru have at first slowed down this subactivity. Consensus has now been reached concerning the revival of UNALM's publication "Anales Cientificos". The evaluators strongly support this option based on the existing name recognition this journal has.

The discussions between FUNDEAGRO and UNALM on the subject have not always been easy. Each institution has tried to obtain full control over the publication, a situation which would render it ineligible for ATT support. It appears that the two institutions are now coming towards an agreement, though the mechanics must still be worked out. The evaluators recommendations follow the principles of this agreement. First, ownership of Anales should remain with UNALM which has the most experience and human resources to carry out this work. Second however, the editorial board must imperatively be opened to at least to UNALM, FUNDEAGRO and INIAA. Until the end of this project, the US technical assistant to UNALM should also be a voting member on that board. Finally ways to financially support the publication after EOP should be explored.

ATT has been very effective in stimulating the production of a large number of publications and exploited a number of publishing alternatives. INIAA, ONA and FUNDEAGRO have published books, magazines and leaflets. INIAA has produced a large number of radio and TV spots. ONA has been particularly effective in exploiting the mass media, especially the national daily "El Comercio" which features an article based on ONA press release almost weekly. A proposal has been made to start up a an agricultural publishing venture known as "Ediagro" made up of the four institutions involved with ATT. Because the idea appears to offer some interesting potentialities it may deserve further study, with some caveats. First the institutions must clearly and precisely agree with each other about ownership and responsibilities. The past record of interinstitutional cooperation under this project is at best spotty, and Ediagro could quickly turn out into an additional reason for mistrust rather than a promoter of collaboration. Second an external evaluation focussing on the business viability of the venture should be undertaken. As found in this evaluation,

this project does not have good capabilities in the evaluation business endeavors. Finally, if a green light is given, the venture should start up with minimal capital investment and shop out most of its printing jobs. Major capital investment would only be justified once a market base has been secured.

To further utilize the media publishing alternatives the idea of an agricultural press service (Agropress), opening up communications channel to publish breakthroughs in agricultural production and extension technology, as well as a host of items of relevance to the agricultural sector. While the general concept is appealing, the sustainability of this scheme is not clear. It is therefore recommended that Agropress be first undertaken as a subactivity of Ediagro, if and only if each of these prove viable on their own merit.

Activity IIIc, **Competitive Graduate Study Fellowships and Participant Training** is directly strengthening the quality of peruvian agricultural professionals. The activity finances M.S. level studies at UNALM and academic (M.S. and PhD) and non academic training abroad. Unfortunately, in-country non-academic training was left out of this component, apparently as an oversight.

The in-country academic program has been modified in the course of implementation. Some funding was reallocated to provide better teaching facilities to M.S. students. Students have also been sent to regional universities although this was not originally contemplated. Generally the selection of students both for in-country and off-shore training has been well adapted to ATT goals. Reports from academic advisors at US schools indicate that trainees were well selected. Women participation was weak at first, but significantly strengthened this year when a conscientious effort was made to involve more women in the training program.

II. IMPLEMENTATION ARRANGEMENTS

Implementation arrangements as designed in the project paper have proven to be a severe constraint to ATT success. This section focusses on these arrangements and presents our recommendations.

The current project structure is presented in figure 1 below. As can be seen, 6 main organizations are involved in project implementation. The adequacy of this structure depends on the capability of each institution to carry out the functions assigned to it, and the viability of the interrelationships between these institutions. The recommendations are based on the premise that it is easier to adapt the project's institutional structure to the actual characteristics of the individuals and institutions involved rather than vice versa.

USAID, represented by the Project Officer, provides the financing for the project (as already explained GOP contributions are minimal). In this capacity, USAID must approve all annual action plans and budgets submitted by the other institutions, and any changes which may occur during the course of the year. Through the Controller's Office, USAID also verifies that expenditures are eligible under US Government (USG) regulations and discusses with the Project Officer what, if any, corrective actions are necessary. Finally, since many of the other institutions involved have had little or no previous experience with USAID before, USAID must also ensure these institutions understand and apply relevant USG regulations.

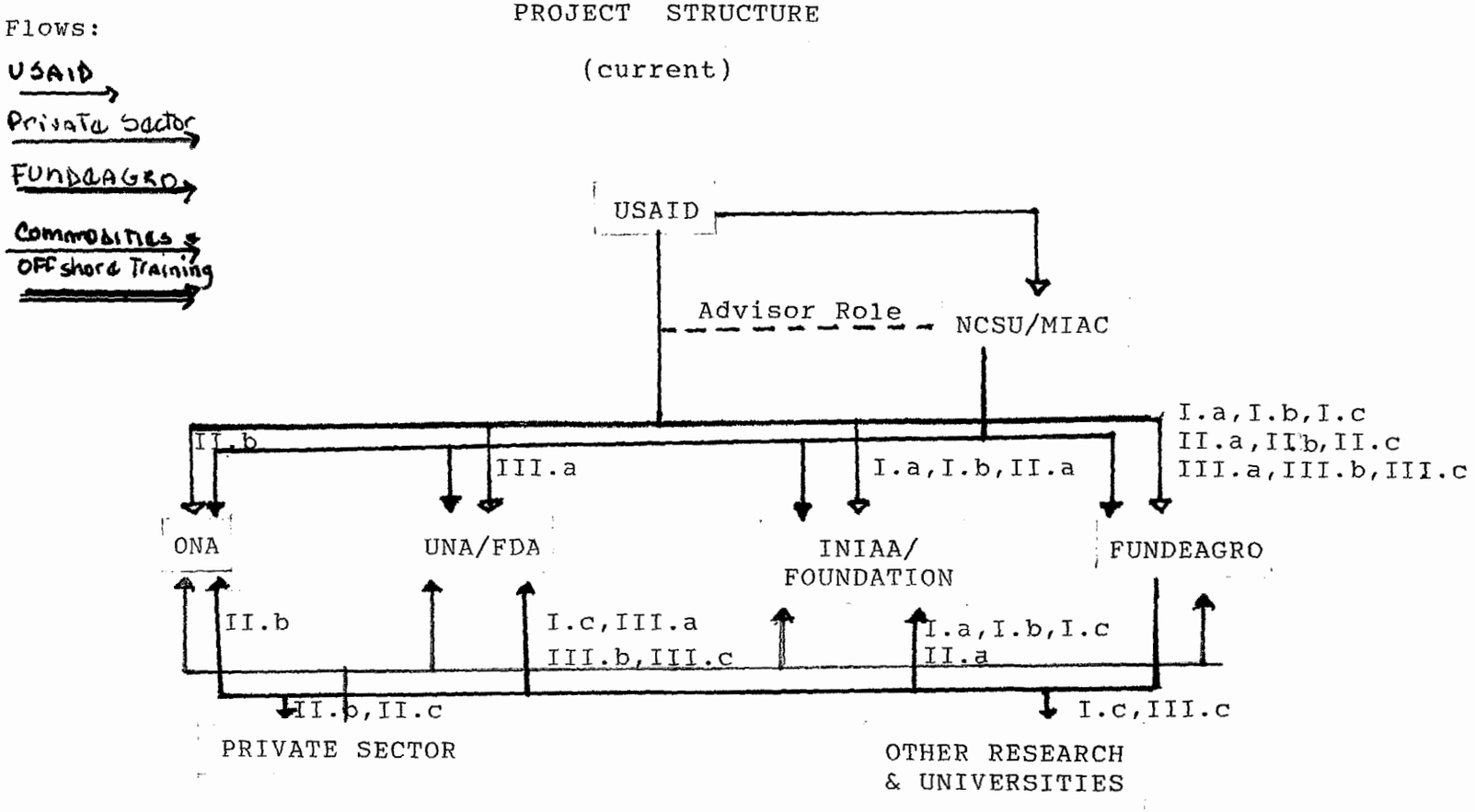
North Carolina State University and the Mid-America International Agricultural Consortium (NCSU/MIAC), the Contractor has an advisory role in this project. Its team of technical assistants provide technical advice in their respective fields of specialization to the local institutions. The contract between NCSU/MIAC and USAID indicates that it is to "Advise the Project Council and implementing institutions concerning AID regulations and program documentation requirements ..." and "promote communications among ATG&T institutions and between them and AID". More recently, and following a long delay due to the bankruptcy of an 8 (a) firm selected to act as purchasing agent for the project, NCSU/MIAC's contract was amended to include commodities procurement.

The "Fundación para el Desarrollo del Agro" (FUNDEAGRO) was created by this project, out of an other institution called FUNSIPA. The latter was a foundation supporting INIPA (INIAA's predecessor) to facilitate the supply of funds to support public sector research. This was necessary because of the heavy bureaucratic and political processes taking place whenever the Peruvian Ministry of Economy and Finance (MEF) is involved. In addition to this role of facilitator of finance to public sector agricultural research FUNDEAGRO was expanded to become the representative of private sector interests in the agricultural sector, promoting research, diffusion and extension, opening markets, promoting quality, and more. Finally, for simple reasons of convenience, FUNDEAGRO became the window through which project funds flow whenever they could not be allocated otherwise. This explains how FUNDEAGRO became involved in financial flows for all 9 activities included in this project, while it has responsibility for only 5 of them. As a result this brand new organization with no track record signed a $12 million over 5 years grant agreement with USAID. According to the Controller's Office, no pre-award survey, designed to ensure the soundness of an institution's financial procedures, was conducted prior to the authorization of this grant. By comparison, the first AID grant to the National Agrarian Organization (ONA), which had been in existence for 7 years, was of only $70,000.

FIGURE 1

PROJECT STRUCTURE

(current)



Note: This chart does not include flows from the GOP

INIAA, the National Institute for Agrarian and Agro-industrial Research, has been supported by USAID for many years. In this project, INIAA is responsible for developing an ever stronger research program, providing a scientific base for the extension service to promote to farmers, and producing foundation seed and assisting in the development of the seed system.

The National Agricultural University UNALM participates in Component 3 of this project. Its researchers are also receive more competitive grants awarded under Activity Ia than any other institution. The Foundation for Agricultural Development (FDA) was created in 1984 to provide a channels for funds to UNA outside the Public Treasury, similar to what was described above in the case of FUNSIPA.

Finally the National Agrarian Organization, a farmers union with national ambitions but whose constituency today is still concentrated among the coast's modern farmers, is to develop economic and statistical information base and provide technical assistance, principally in farm management and feasibility studies.

Through these institutions the project linked with two groups, the private sector in agriculture, farmers and agribusiness, and other universities and research institutions.

The project ran into serious implementation difficulties almost from the onset. The large majority of these can be traced to the obsessive insistence on coordination between institutions and because one of them, FUNDEAGRO, controlled 80% of project funding to participating institutions, much of which only passing through. In doing this the design of the project was in total contradiction with the wisdom it claimed to apply (see Project paper: Annex II, Exhibit H, Page H-3):

> "A key lesson learned in both the REE and the APID projects in their activities to promote closer relationships through financial resource control and contract relationships is that a high premium is attached to institutional independence. Thus, the ATT Project segregates funding for all institutions so that none may dominate the others"

Instead of being a facilitator, FUNDEAGRO established some eminently bureaucratic rules and intervened in activities which were not directly under its responsibility, but for which it acted as a channel for the disbursement of funds. Other institutions, on the other hand, did not understand FUNDEAGRO's role and resented the organization even when it was implementing the activities it was responsible for. Probably as a result of these confusions, UNA did not participate in the project for two years.

All the coordination mechanisms envisaged by the project paper, have broken down by now. The project secretariat, which is composed of the project managers of each of the implementing organizations stopped meeting after a year. At present it only assumes a clerical role for the preparation of progress reports. The other coordination mechanism, the project council, made up of the president of FUNDEAGRO, the Chief of INIAA, the Rector of UNA, the President of ONA and the Chief of USAID/Peru Office of Agriculture and Rural Development (OARD) only met once to inaugurate the project. This absence of coordination led to serious implementation problems. This year for instance, FUNDEAGRO did not include the cost of INIAA's National Advisors in its budget. FUNDEAGRO insists that these were never included in its original five year plan, reviewed by NCSU/MIAC approved by USAID. This, however, was clearly an oversight and FUNDEAGRO's real motive was probably to obtain more funds for its own activities. Nevertheless, the project should be protected from such interpretations.

Relations between USAID and FUNDEAGRO also soured, mostly over financial management issues. The heart of the problem lies with ineligible an undocumented expenditures incurred by FUNDEAGRO. While these are substantiated by a financial evaluation conducted by Price Waterhouse, substantial fraud is not suspected. Actually a large part of these are items are typically covered by counterpart funds in other projects. The almost total absence of such funds in this project is thus part of the reason for this situation. The findings show that while FUNDEAGRO management did include some items which would be clearly ineligible even to someone working for the first time under USG regulations (gas in a personal car for instance) such items aren't very numerous. On the other hand, FUNDEAGRO management did not take adequate steps to regularize this situation. The personnel policies submitted by FUNDEAGRO at the request of USAID, were obviously written in a hurry, or are incomplete by design. For example they do not regulate the conditions under which FUNDEAGRO is entitled to dismiss its employees, whether for cause or for convenience, except in the limited case of unjustified absence from the workplace. In addition some of its clauses are clearly unacceptable such as section 1.2 of the "Procedimientos para el Reajuste de Remuneraciones del Personal de Planta de Fundeagro", which leaves the field open for arbitrary salary increases. Given the experience of FUNDEAGRO's top executives it is hard to understand how such a clause could be introduced.

Against this, the Mission has been too slow in forcing these systems into FUNDEAGRO. While the diagnostic concerning the absence of systems has been made a year ago, such systems still aren't in place. This makes it possible for FUNDEAGRO to present a convincing defence, pointing to the inconsistency in USAID/Peru's interpretation of eligibility and the long time the Mission took to prepare its liquidations (some took close to a year).

Financially this dispute does not jeopardize the project, since the amounts are not significant in comparison to the huge loss to the project due to the lack of counterpart funds and inflation. The dispute does not even threaten FUNDEAGRO's financial situation. With inflation running at over 30% per month at present and all accounting being in nominal Intis, the long delays involved provide the solution. For example, if USAID/Peru refuses to recognize an Inti amount equivalent to $25,000, the same amount of Intis could be repaid by FUNDEAGRO a year later, when it would be worth about $1000. This way, USAID never authorized the expenditures though FUNDEAGRO obtained their de facto recognition. The main problem thereafter is the lack of trust continuously existing between both organizations.

In conclusion the main problem affecting the FUNDEAGRO-USAID relationship stems from the absence of proper management procedures at the design stage. This project should not have been started until FUNDEAGRO was equipped with appropriate safeguards. Later FUNDEAGRO obviously dragged its feet in implementing such systems, while the Mission did not sufficiently press the issue, maybe out of fear that the whole project would come to a stop. It also appears that the NCSU/MIAC team stayed on the sidelines and did not act upon the urgency of the situation. The situation has now reached the point that the organizations have lost the mutual trust which is an imperative to any relationship in a project. FUNDEAGRO however remains the only organization with the mandate necessary to conduct the key activity of the competitive grants program. Unless a solution can be found, for which a proposal is presented below, this project should be terminated.

It should also be noted that a side effect of vesting authority over such a large amount of funds in FUNDEAGRO, the project design jeopardizes the sustainability of FUNDEAGRO. To date the amount of funds FUNDEAGRO manages for ATT represents 90% of the organization's budget. Most of the other 10% is ATT's contribution to the organization's overhead. The foundation's linkages with other sources of revenue is minimal. Thus ATT becomes the only concern of the organization and FUNDEAGRO officials have lost track of future objectives. As things stand today, the institution has no chance to survive ATT.

During the evaluation, members of the team had the occasion of meeting twice with the Board of Directors of FUNDEAGRO had presented these findings. The Board expressed great interest and showed its desire to try to give the foundation another chance. Both USAID and the Board can make this possible if agreement at the top level is reached on three essential points:

- FUNDEAGRO's management structure and systems need to be immediately overhauled. The Board needs to take a more active participation in FUNDEAGRO's activities. USAID should swiftly

contract for, review and approve adequate management systems for the organization.

- FUNDEAGRO has to relinquish control over any funds which are currently passing through. USAID has to quickly act on the redesign of the project diverting those funds. This includes all funding for activity IIIb which would go to UNA.

- FUNDEAGRO and USAID should limit project activities undertaken to activities Ic, IIc (only for the seed committees) and IIIc, at least temporarily. This would be at the risk of having to deobligate some funds and "losing" them. It may however save the project.

Our proposed solution to the project structure is presented in Figure 2. This figure include all the flows under the project, taking into account the recommendations presented in the previous section. Thus funding to INIAA is stopped. Under this new scheme, funds for any activity would flow directly to the implementing institution responsible for the activity. Responsibilities would never be shared. The scheme adds a project secretary who would replace the secretariat envisaged in the project paper, and who would have line responsibility. This single individual would be an AID hire and fully knowledgeable of AID regulations. He would be available for consultation whenever an institution would like to check on the eligibility of an expenditure before incurring it. To the extent permitted by law USAID would recognize his decisions. He would also be authorized to stop any flow of funds or reallocate priorities within the limits permitted by USAID regulations. Note that the project secretary would not substitute the monitoring of the project by the project officer or the controller, but speed up the process when doubtful situations arise, and by taking on a heavy responsibility, promote a continuously good understanding between the implementing institutions and USAID.

Originally this function was assigned to NCSU/MIAC albeit as advisors only, and as mentioned above, NCSU/MIAC could not or would not take action. This is probably due in part to the long association of both NCSU and MIAC with existing institutions in Peru. In other words, what is a clear advantage from the technical standpoint given the wealth of relevant experience offered by these institutions, becomes a constraint when comes the time to take sides and force actions against the will of a local institution.

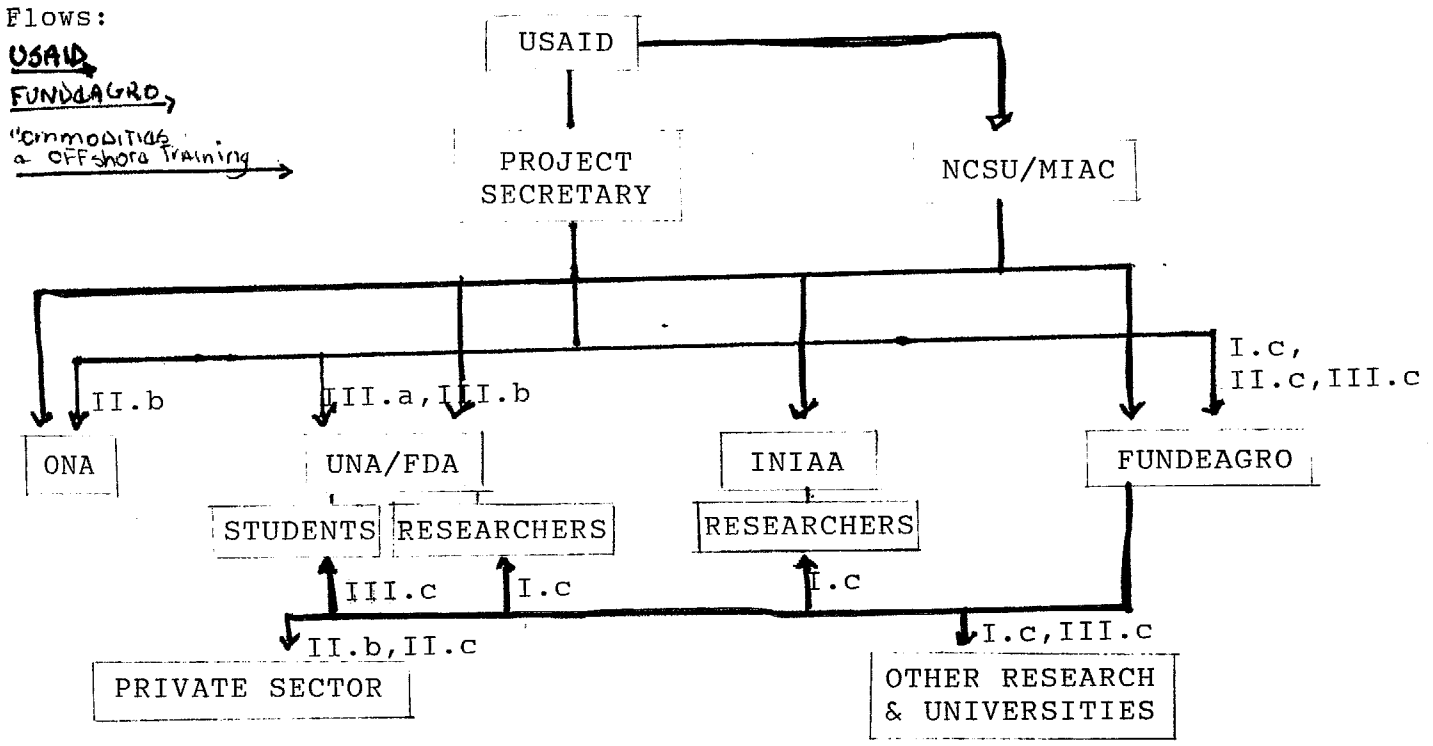
Because this solution implies a redirecting of financial flows which may not be possible in a short time, a temporary solution is presented in Figure 3. In the interim period, the project secretary would make all decisions for those funds which are passing through FUNDEAGRO but which really pertain to the other implementing institutions, in coordination with the latter. Though its bank account would still be used, FUNDEAGRO would thus

immediately be reduced and be able to concentrate on its real responsibilities.

FIGURE 2

PROJECT STRUCTURE

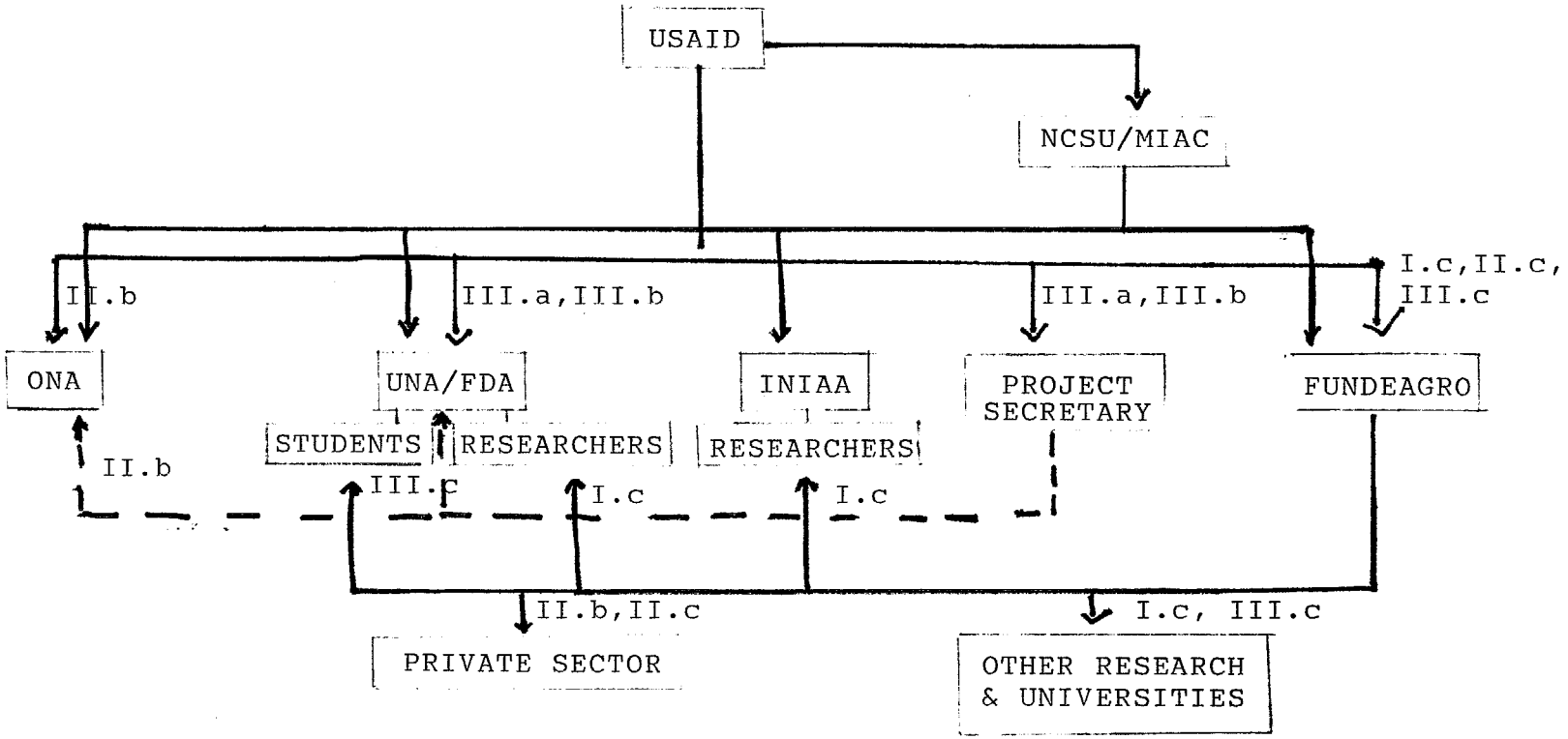
(proposed)



Note: This chart does not includeflows from the GOP

FIGURE 3

(transition)



Flows:

USAID →

Through FUNDEAGRO →

controlled by USAID →

commodities &

offshore Training →

III. OTHER FINDINGS AND CONCLUSIONS

A number of constraints external to the project have severely affected its chances of success. The economic situation, resulting in large part from the macroeconomic policies adopted by the government is the main one. The lack of security and terrorist activity has also affected the project but to a lesser extent since it concentrated many of its activities on the coast.

Government policies affected the project along three major lines:

- because the Treasury ran out of funds and other sectors such as Police and Army receive priority, the GOP has only been able to pay for salaries in the agricultural sector;

- policies pertaining to price control, free trade and rate of exchange are basically adverse to agricultural development;

- hyperinflation, it has reached around 40% per month during the time this evaluation took place.

The first implied that counterpart funds for purposes other than salaries were never disbursed. Basic infrastructure was not maintained either. In the face of this situation, ATT virtually became the only source of operating cost for INIAA, and this institution used some 85% of the planned budget in less than half the project period.

The second and the third raise doubts about the validity of private sector development activities as undertaken in this project. In today's environment speculative activities have much more of an impact on a company's profit or loss than technical criteria. Inflation rates in particular, are so volatile that they cannot be captured in any business plan, no matter how professionally prepared. For example while this evaluation took place, the exchange rate jumped from I/78000 to the dollar to $100000 in less than three days. A right decision at this stage can make the year's profit.

The US Treasury disbursement system is unadapted to the hyperinflationary conditions currently prevailing in Peru. While this problem has been identified, it has signified substantial loss by the project. This problem should be solved with urgency. It can be safely estimated that inflation and counterpart funding combined the project is functioning with half its planned resources.

The project paper anticipated some of these constraints and indicated that the policy constraint would be addressed by other AID activities. The lack of success of these activities has been obvious for some time.

It is regrettable that ATT did not pause to revise its design in light of the extremely special situation which developed in Peru. INIAA became incapacitated and the project was described as a holding action by NCSU/MIAC personnel. But is it really USAID's role to support INIAA's survival just because it had the bad luck of being the last donor involved with the institution?

Project funding was curtailed by the non payment of counterpart funds and by inflationary losses. However all activities went on as if nothing happened. To the contrary, many proposals were and are being made to open a new line of activity in an already overstretched project. Appendix A presents summary tables prepared for the evaluation team by NCSU/MIAC technical assistance. According to these tables, objectives are generally being met. Since funding was reduced by half, this should mean that budgets (i.e. the design) were grossly overestimated or that these scores are overblown. While budgets were generous in some cases (training), many of the achievements were obtained by lowering standards. A functioning committee is one that met at least once, an experiment becomes a research project, a trained technology transfer specialist is one that has been assigned a position, a technology transfer enterprise is nothing more than a group of individuals or a going concern, who signed a letter of agreement with FUNDEAGRO and received technical assistance.

ATT needs to take the realities in Peru more into consideration. Decisions concerning the continuation or stopping of activities should not be avoided if the situation warrants it. Any activity necessitating GOP counterpart funding should be stopped or at least downsized until such time the GOP is able to contribute to it. It should be recognized that the sustainability of private sector development is extremely limited in the present business environment.

By limiting project activities to the competitive grants program, Departmental Seed Committees, curriculum development, the scientific journal and the scholarships program, the project would be reduced to accommodate the size of the funding available to it. These valuable activities can produce an impact. They may even be self sustaining by the end of the project, with the exception of the competitive grants program and the scholarships. If these deliver on their promises, a follow-on should be considered.

CHAPTER I

Research

I. RESEARCH

A. Background

Unique challenges face agricultural development in Peru. They stem from the presence of more natural adversities to agriculture than in most nations and the greatest national diversity of agroecological zones in the world. These challenges are compounded by a history of political turbulence, a weak private sector, a public sector with limited technical and leadership capabilities, stagnation of agricultural production, socioeconomic crises, drug trafficking, a growing terrorist movement, etc. Furthermore, two thirds of the population earn their livelihood from the agricultural production, processing, and marketing (PPM) system. This system provides 85% of nationally consumed foodstuffs, 20% of raw materials for industry, and its exports earn 11-14% of foreign exchange. Consequently the agricultural PPM system profoundly affects the economy of Peru. Since it is fueled by the agricultural technology generation and transfer (ATG&T) activities, it follows that commitment to support implementation of well developed ATG&T programs is required at the highest levels of administration. Such ATG&T programs must be ecologically sound, socioeconomically feasible, and sufficiently varied to address the diverse range of agricultural PPM conditions in Peru, yet focused enough to concentrate effective efforts on areas of national priority.

These requirements have important implications for the ATT Project, whose purpose is to expand the scope and improve the quality and relevance of agricultural technology being generated for Peruvian agriculture, and of technology transfer services being provided to Peruvian farmers, in order to increase rural incomes and reduce unit cost of agricultural production while increasing agricultural productivity and yields.

The most obvious implication is a complex, ambitious project design in which agricultural research is organized under five areas, each consisting of from 2 to 15 research programs (Appendix B, Handout #1). Many were initiated between 1983-1987 under the Research, Education, and Extension (REE) Project. They were supposedly improved via consolidation and integration under ATT on the premise that a responsive ATG&T system requires joint participation of public and private sector entities.

ATG&T ENTITIES

Public sector involvement in ATG&T is represented by INIAA with major responsibility for technology generation; and UNA which mainly generates seed technology, especially in corn, wheat, and barley in cooperation with the private sector. Private sector involvement includes farmer organizations, farm input supply firms,

commodity processing and marketing firms, and other civil or nonprofit organizations. Indications are that the above premise is sound if direct public treasury support of public sector ATG&T efforts is sustained and supplemented from private sector sources.

Overall program strategy of INIAA in ATG&T functions is to integrate geographically diverse and functionally decentralized research and transfer activities via national/regional research programs (see Legislative Decree NO.424, 26 June 1987). Twenty nine research (R) and research support programs (RSP) are managed by INIAA of which 15 are agricultural, 2 agroindustrial, 3 forestry, 5 animal husbandry, and 4 research support (Appendix B, Handout #1). They are headquartered on research stations located where the particular program is of major importance.

Note here that the preceding REE Project, including other contributions, was a US$7 million/year project of which 37% was allocated for the research component between 1981-88. Research programs of INIAA on rice, corn, potatoes, small grains, and grain legumes, plus the Sierra, the Selva, integrated crop protection, and genetic resources involved work on 21 Agricultural Research and Promotion Centers (CIPAs). The final evaluation (REE/AID No.527-0192, Lima, June 1989) appropriately cited AID/Peru for not fighting the tendency to over-extend scope of the project with respect to available resources.

The US$1.5 million/year ATT allocated research 50% (assuming nothing was spent for extension) between 1988-93. Research programs of INIAA (formerly INIPA) on rice, corn, potatoes, grain legumes, small grains, livestock, oil seed crops, plus agro-economy, the Sierra, the Selva, and five on NRS involve work on 22 centers according to the ATT Project Paper. Now (5 July 1990) 29 research programs involve work on 22 centers. Consequently, 9 research programs on 21 centers with US$2.5 million/year for 7 years under REE evolved to 29 research programs on 22 centers with US$0.8 million/year for 5 years under ATT. This, despite project research component I.a. Consolidate and integrate INIAA research programs.

The ATG&T program strategies of UNA and the 15 regional universities is modest relative to that of INIAA. Agricultural research efforts of UNA include the following four areas which are not emphasized in INIAA's NR and NRS programs:

1. farm management
2. irrigation, drainage, and soil/water conservation
3. agricultural mechanization
4. transportation and marketing economics

Research strategies of regional universities are even more modest, address local priority problems, and provide practical training in research methods to students. Private sector organizations and

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companies typically support only research projects which coincide with their respective business interests.

Another major participant in ATG&T activities on a national basis is FUNDEAGRO, mainly via:

1. competitive small grants program conducted to encourage integration of public and private sector entities in agricultural research.

2. research grants designated for INIAA and UNA.

3. contracts with national advisors for technical expertise, primarily to assist implementation of RP/RSP within INIAA.

Most NCSU/MIAC members also mentioned FUNDEAGRO's value in maintaining continuity of ATT program support and direction, explaining that directors of all other institutions associated with ATT are political appointees frequently without technical qualifications, are subject to transfer on short notice, and may have priorities that do not coincide with those of ATT.

ATG&T PROGRAM

Attempts of ATT to formulate a cohesive, national ATG&T program involving the above public and private sector entities on a sustainable basis have met with mixed results. The consensus of the team is that this is mostly due to the following factors:

1. attempting too much with too little

2. political and socioeconomic impediments

In reference to the first factor, neither USAID/Peru nor the GOP ever committed sufficient resources to provide more than minimum support of the ATT agricultural research program.

The second factor pertains to national realities. Historically, GOP administrative appointments to public sector organizations have often been based on political rather than technical qualifications. Separating research and extension service personnel under different administrative institutions in 1987 is an example of political decision over ruling technical logic. Such decisions cause instability, interfere with continuity of effort, and create barriers to integration of research and extension efforts. Other contributing factors: low salaries resulting in a shortage of qualified personnel; no counterpart funds; little or no institutional coordination between INIAA, UNA, FUNDEAGRO, and private sector agribusiness organizations in planning national research

priorities; little or no participation of farmers on committees, boards, etc. of institutions engaged in agricultural research.

B. Analysis

Each of INIAA's R/RSPs receives assistance from at least one national advisor who helps compensate for the inability of INIAA to attract and retain qualified professionals within the limits of its low pay scale. The national advisor of a R/RSP is replaced by a technical advisory committee when the R/RSP becomes "mature", ie. selfsustainable. Meaningful adequate political and budget support is assured to sustain the R/RSP efforts upon termination of ATT. More specific indicators of maturity are listed in Appendix B: Status of Life-of-Project Outputs, Component I.p.3 and Handout #1. All five livestock RPs plus those for rice, corn, grain legumes, and potatoes have achieved maturity. Progress of others is mixed. Overall This aspect of ATG&T may be considered on or ahead of schedule. Several sources credited much of this success to technical expertise contributed by the national advisors.

Maturity of a research program however does not imply solutions have been developed for even half its problems. Simply establishing research priorities is an unusually complex exercise in Peru. The large number and flexibility of environmental, political,and socioeconomic variables creates a dynamic scene. Sound priorities may become irrelevant two months after establishment. Traditional indicators often used in establishing agricultural research priorities are unstable. For example the market place rarely reflects supply and demand of commodities; extension service feedback is at best convoluted; and the economic situation among agricultural producers is not fed back to research planners on a regular basis.

Under ATT, support of agricultural research has drastically declined. The current operating budget of INIAA is 80+% less than its 1986-87 level. This large, rapid loss has seriously affected INIAA's research infrastructure, however it deserves commendation for heroic efforts to retain research quality. When questioned on how this was accomplished, both national and district level officials mentioned changing priorities and cost cutting. For example Peru's rice breeding program, recognized as one of the nations models, does not have adequate resources to even keep maintenance research [1] current. Vista Florida Research Station, Chiclayo, National Rice Research Headquarters, reportedly has had

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[1] That portion of new research devoted to maintaining gains realized from previous research. For example, insect or disease tolerance of a variety lasts only until new insect or disease organisms evolve, hence maintenance research must constantly be on-going.

a standing request in for a green house for 20 years now. If honored it would enable the breeding program to continue year around rather than seasonally, greatly reducing time required to develop new improved varieties. The station has hauled water from a nearby irrigation ditch the past two years because the water pump remains unrepaired. The water distiller, flame photometer,exhaust hood, and other instruments have long gone unrepaired for lack of funds. Consequently the 3030B Atomic Absorption Spectrophotometer can not be used, extension service personnel brought farmer's soil samples in for analysis but not since their transfer to MOA. One tractor and a vehicle is shared by eight researchers. The corn researchers had experiments on nine different farmer's fields but lost two for lack of a vehicle. These represent research restraints on one of the better stations.

The following, more positive findings reflect a commitment to overcome such restraints.

1. Five new rice varieties were released and others being selected for quality, strong kernel, early maturity for the coast plus blast disease tolerance for the Selva are in the making.

2. This year the Rice Millers Association financially supported continuation of rice research projects on improved varieties and cultural practices which otherwise would have prematurely stopped when the Rice Growers Association support funds ran out.

3. Four new bean,one grain sorghum,one wheat, and two hard yellow corn varieties were released.

4. The Vista Florida station cooperates with four other stations in the rice research program plus three others, respectively, in corn, grain legume, and goat research programs. This is typical for all stations.

5. Good relationships with CIAT, IRRI, CIMMYT, etc. facilitate specialized training, graduate studies in USA, tissue culture work for rice research, germ plasm exchange, etc.

6. Recent research demonstrated the cost effectiveness of several cultural practices in increasing rice, corn, and grain legume production.

7. Integrated Pest Control Program studies chemical, cultural, and biological control of diseases and insects in rice, beans, and corn.

Visits to the Los Andenes Station, Cuzco, and Taray Station, Pisaq generally confirmed the initial impression formed at Vista Florida, Chiclayo. Similar responses were reported by the rest of the

team. Ten of the 22 research stations within INIAA's network were visited by one or more team members. In each case many improvements of buildings and equipment made under the REE have deteriorated under ATT.

A corresponding deterioration in the quality of research was not as obvious. The infrastructure may be falling apart, but most research inputs are made available on time. Many station directors allocate some per diem funds from the budget to facilitate on-farm trials and visits to substations by researchers. Along the coast some valley producer organizations even collect extra check-off funds to support a specific research effort on their local station. Numerous examples of individuals sacrificing personnel time and money to conduct research were noted by the evaluation team.

After establishing and implementing research priorities, results must be analyzed, validated and transferred.

Analysis of research results provides an objective basis for evaluation. This was found to be a weak area relative to other activities involved in agricultural research. Some researchers were not aware of software available for data analysis nor how to use a calculator for analysis of variance. There seemed to be much misunderstanding about the subject of mean separation. This can lead to overlooking important conclusions in an experiment. Conversely, a few researchers demonstrated good understanding of analysis of variance and the method of orthogonal coefficients.

Validation of research results was understood, appreciated, and usually appeared to be carried out when transportation and other inputs were available. Two factors influence the level of this activity. One, few ATT research results are ready for validation. Most that are, were carried over from REE. Two, precious little resources (personnel, funds, vehicles, etc.) are available for validation work.

Observations on transfer of research results were similar to those of validation. With the exception of CTTA training and support for technology transfer (TT) specialists (Chapter on TT), results were even less quantifiable for the following reasons:

1. Since 1987 few qualified TT Specialists actually serve as a link between researchers and producers.

2. Of those that do only about 52 are actually within INIAA. Others perform TT activities, but under administration of private agroindustry firms, farmer organizations, banks offering agricultural credit, etc. No public or private entity actually coordinates or supports the TT activities of these various actors.

Consequently this link between research results and adoption by agricultural producers under ATT is as weak or weaker than it was under REE. Numerous examples were observed, a few of which are mentioned below:

In Cuzco a student conducting research on TT for his MS thesis reported that many farmers appreciate the value of applying fertilizer but do not use it because of the red tape involved, ie. requirement of several signed permits to purchase it.

Often, it is difficult to differentiate between nutrient deficiency and plant disease symptoms. Trained extension personnel are not available, but methyl parathion is (no purchase permit required) and is regarded by farmers as cure-all medicine. It also has a low LD50 (highly toxic) and indiscriminate use on crops causes a lot of sickness and even death among farmers.

Advantages of improved early-maturing potato varieties are unrealized because harvest date is a community decision based on maturity of full-season varieties.

Forestry workers over the years have planted millions of eucalyptus trees even though people much prefer pine and other native species.

On a field trip to a potato growing area near Cuzco a severe infestation of potato weevil Prenotrytes vorax, etc. (Gorgojo de los Andes) on farmer's fields was observed. One researcher was preparing for a farmer's field day to demonstrate the combination of cultural, biological, and chemical control measures required. Suspicion that the problem was larger than one researcher could effectively address was confirmed by an International Potato Center (IPC) specialist on potato weevil. He said approximately 96% of Peru's potatoes are grown in the Andean (Sierra) area of which 50% is severely infested with potato weevils; that this has been recognized as one of the most serious problems in potato production since 1952; that research has provided control measures ready for extension; and that a massive campaign could bring the problem under control within 3-5 years.

The competitive small grants program administered by FUNDEAGRO, mentioned previously, appeared to be the strongest best-supported research program within ATT. Proposals from agricultural researchers are screened by a peer evaluation group (GREPI) composed of one core representative each, from AID/Peru, NCSU/MIAC, and FUNDEAGRO; plus four representatives from the scientific community. The guidelines for the evaluation of research proposals are presented in Appendix C.

Over 300 proposals have been received, 76 funded, and about 9 completed. Of those funded, 62% deal with crops, 21% with livestock, 1% with soils, and 16% with insects, labor, and

miscellaneous. About 55% are conducted along the coast, 27% in the Sierra, and 18% in the Selva (Appendix D). Most are small (US$500-1,000) short term (1 year or less), one investigator projects.

Final reports of the nine completed grants were reviewed. They generally reflected sound scientific approach, good description of the problem, and organized presentation of results. There was variation in format, especially style; in use of a logical system of inductive reasoning; and in standards of experimental design and analysis of results.

INSTITUTIONAL CAPACITY FOR ATG&T

Agricultural research needs of Peru in the 1990's are greater than its institutional capacity to meet these needs. As mentioned previously, even maintaining the gains of previous research is a struggle due to deterioration of institutional infrastructure. Other examples/reasons of inadequate institutional capacity are:

1. Lack of accurate and realistic identification of constraints within Peru's complex of agroecological zones. A more multidisciplinary team approach is required to correct this. Crop, soil, and animal scientists working with agrometeorologists, agricultural economists, rural sociologists, agricultural engineers, and even scientists from disciplines such as health and computer science are often required to best determine whether and how a problem can be solved.

2. Weak links between agricultural research, extension, and teaching. The strength of the agricultural sector of most economies is reflected in the strength of these linkages. The complexity and interdisciplinary nature of agroecological problems in Peru requires much closer integration of research, extension and teaching personnel working with farmers, the ultimate integrator of agricultural systems.

3. One consequence of no. 1. and 2. is inadequate ATG&T policies that help farmers compete more effectively. Agricultural technology is improving rapidly throughout the world. As the capacity to produce agricultural products increases, agriculture becomes more competitive. This will exert downward pressure on prices. If profits are to be sustained as prices decline, production costs must also decline, therefore ATG&T activities in Peru must focus more on generating and transferring information that will help farmers,the real core of Peru's agricultural strength reduce their production costs.

4. Little financial support of ATG&T from the public sector.

It may be argued that no. 4. is the main reason of inadequate institutional capacity, also that improvement of ATG&T is the essential first step whereby Peru can hope to raise living standards. In addition, clear goals and sound rationale for each ATG&T program is necessary to persuade the GOP that additional support is worthwhile. The ATT Project Paper, p 116, cites two studies in Peru that reported annual internal social rates of return (IRR) of 23-42% for public sector investment in ATG&T. A cooperative effort among all researchers to provide such evidence on how support of AGT&T will pay off is needed.

Private sector supported research alone will not improve institutional capacity. Private firms are largely product oriented, generating such inputs as crop varieties, fertilizers, pesticides, machines, etc. which are marketed aggressively. They cannot be expected to provide unbiased answers to questions about competing products. They cannot afford to do much farm-scale production systems research, because these studies involve combinations of input products and practices from many suppliers and must be conducted at many locations over several years. They have their place, but it is not in developing site-and situation-specific ATG&T research designed to yield information on which farmers can plan, implement , and manage profitable production systems in each of the specific soil, climate, and socioeconomic situations of Peru's agroecological zones. This requires better public support of INIAA and UNA to insure sustainability after ATT termination.

C. Conclusions

1. Approval by AID/PERU of ATT with more research programs and approximately 300% less support than the REE Project was unjustified in light of the experience that should have been recalled from the REE Project results.

2. Loss of purchasing power of the Dollar budget due to decline in exchange rate severely impacts research and other ATT activities. To date this problem appears bigger than all efforts to overcome it.

3. Action is urgently needed to halt deterioration of research infrastructure within INIAA. This should be supported from GOP Public Treasury funds rather than ATT funds for any semblance of ATG&T sustainability to be demonstrated.

4. Quantifying AGT&T results under ATT is difficult due to recent (1988) implementation and absence of a recent baseline study for comparison. The baseline study of

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1979 (GOP and USAID) contained recommendations for inclusion in the REE Project. Many were enacted. One exception: "Establish the necessary facilities for integrating research, education, and extension under a coherent system that focuses on production of food commodities and the solution of producer and consumer needs", is regarded a serious omission. A similar recommendation was repeated in the 1984 REE mid-term evaluation (USAID) and the 1989 REE final evaluation (USAID). Each was obviously ignored indicating the futility of another repetition.

Note: The above three items clearly show that ATT objectives I.a. and b. and the spirit of II. a. have repeatedly been ignored for more than a decade. Consequently, little or no justification exists for continuing efforts to establish an effective ATG&T program via INIAA.

Ref: GOP and USAID. 1979. Baseline study of the Peruvian agricultural research, education, and extension system, Vol. I,II, and III.

Ref: USAID, 1984. Mid-term evaluation of the USAID research, extension, and education project in Peru. M. Whitaker, team leader.

5. Development of a professional journal for publication of peer reviewed scientific papers under the auspice of UNA appears to be a good idea currently under consideration (Chapter on TT). These usually provide an excellent means of professional recognition, exchange of scientific information, and documentation of ATG&T results.

   In addition, professional society sponsored national/regional annual meetings might further improve cooperation and coordination of research efforts between and within ATT entities concerned with ATG&T.

6. Development of improved varieties by INIAA and UNA in cooperation with IARCs, and private companies is commendable, but at least equal effort should be allocated to AGT&T designed to ensure realization of the improved genetic potential.

D. Recommendations

In view of the above Conclusions responsibility for consolidation and integration of a national ATG&T program should be transferred to FUNDEAGRO's competitive small grants program for the remainder

of LOP of ATT. This should include transfer of the $435,000 currently designated for INIAA, plus the special grant funds to INIAA to the FUNDEAGRO competitive small grants program. National advisor contracts with personnel assigned to INIAA should be phased out within one year and the remainder of those associated funds also transferred to support FUNDEAGRO's competitive small grants program.

Alterations of the FUNDEAGRO competitive small grants program should include the following:

1. Require each research proposal to include a TT component. This component should involve coordination with a public or private sector TT specialist, preferable one who has received CTTA training. Alternatively, extra points might be allocated to proposals which include a TT component. The objective is to assure TT to producers as an integral component of the grant. Either way, alterations of proposal format and reporting procedures must be made to accommodate this change.

2. Composition of membership in GREPI should continue as stands.

3. Assurance that each researcher under INIAA has access to the competitive small grants program equal to each researcher under UNA or the private sector.

4. Expand the proposal writing and reporting training program to include INIAA research personnel.

5. Institute promotional efforts to encourage multi-disciplinary, inter-institutional project proposals which also include the TT component described in Recommendation no.1.

6. Allow additional points to any research proposal which includes a percentage of matching fund support, ostensibly from a private sector source.

7. Organize composition of GREPI into panels according to technical specialty, ie. crops, water/soil management, animal husbandry, entomology, etc. Alternatively, refer proposals that are outside the technical expertise of GREPI to peer review by at least two qualified individuals for preliminary approval.

8. Establish strict in-house procedures guaranteeing approved projects will not be altered by FUNDEAGRO staff outside of GREPI members. FUNDEAGRO staff must be responsible only for determining the project's overall

budget, administration of the funds, and follow up of progress.

9. Grievances must be settled by a panel composed of the three core members of GREPI.

10. Encourage improved quality of project reports via development of a style manual for scientific writing which includes standards for grammar, abbreviations, units of measure, literature citation, etc.

11. Facilitate access to technical information sources in Lima for Data base searches, literature reviews, etc. by all researchers whether they submit proposals or not.

12. Include support of transportation and per diem for field research activities associated with approved proposals.

13. Reduce budget category details currently required in project expense reports.

14. Schedule courses in field-plot technique/experimental design open to all researchers. Include fundamentals of hypothesis formulation; planning an experiment to test the hypothesis; observations, data collection and analysis; and interpretation of results. This may be the most cost effective way to increase national standards of ATG&T.

15. Stipulate that continuation of ATT support for the competitive small grants program be contingent upon the recommendation of a comprehensive evaluation conducted by an independent evaluator on at least an annual basis.

16. Research project funds must be made directly to the senior author of the approved proposal. A maximum of 20% of the total project funds may be allowed for overhead and use of facilities of the public institution or private enterprise to which the senior author belongs.

In closing, project objectives of Component 1. Technology Generation, remain unchanged except in Activity a: and b: where the acronym INIAA is replace by FUNDEAGRO. Activities of ATT are still designed to improve the quality and relevance, and increase the amount of ATG&T output by expanding research opportunities for other actual and potential research participants.

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CHAPTER II

Technology Transfer

II. ATT TECHNOLOGY TRANSFER

The broad purpose of ATT's technology transfer (TT) component is to increase the rate of adoption of new agricultural technology by a figure of 10-20% and to reduce the cycle of adoption from 8-10 to 6-8 years (see Project Paper, Annex II, Exhibit A, P. 12). These goals are to be accomplished via three activities: establishment of TT "specialists" within INIAA, stimulation of private-sector TT enterprises, and organization of a nationwide improved seed production and certification system involving both private- and public-sector actors. The latter two activities are discussed in the chapter on the private sector. Here, the focus is on the public-sector TT specialists.

INIAA TT SPECIALISTS

The plan to establish a corps of TT specialists within INIAA arose in response to the June 1987 law that assigned all public-sector extension functions to MINAG. Prior to this, extension and research were combined within INIPA, and reportedly were more or less well-integrated "on the ground" at the CIPA (now EEA) level. But the 1987 "re-structuring" of INPA and MINAG opened a chasm between research and extension. I.e., under the new division of labor, what unit or persons would process, package, and transmit INIAA research results to MINAG extensionists and other PATs (proveedores de asistencia tecnica)?

Hence ATT's plan to create a TT corps under INIAA's Direccion General de Proyeccion de la Investigacion y Servicios Tecnicos (DGPIST). The DGPIST is the sole office expressly charged with technology transfer in INIAA. As TT "wholesalers," INIAA TT specialists are supposed to target TT "retailers" spanning both public- and private-sector PATs of all sorts, including: MINAG extensionists; PATs in regional governments, which also fund extension work; regional university professors and other professionals that do TT consulting; producer organizations of various kinds; agribusinesses, including seed multipliers and companies and agricultural service firms; and innumerable NGO PATs.

Both NCSU-MIAC/ATT/INIAA documentation and the evaluation team's many interviews indicated considerable confusion among project participants as to exactly how many, who, and where these TT specialists are. However, according to explanations and personnel rosters provided by DGPIST/Lima, as of 22 May 1990, a total of 52 specialists are posted to EEAs around the country (Appendix E, Table 1). The DGPIST divides these individuals into two groups, as discussed below.

Coordinadores de Transferencia de Tecnologia (CTTs)

These "specialists" are in fact generalists insofar as they are assigned to transfer information about many or even all plant and animal crops dealt with at a given station. DGPIST/Lima informs that there are currently 34 (33 male, 1 female) CTTs. Reportedly, most have some formal educational background in extension, usually from UNALM. This factor is said to have been the basis for retaining them in INIAA at the time of restructuring and for designating them as CTTs (although expectedly, other factors also appear to have intervened). The same source reports that approximately 50% of these 34 has done post-graduate studies of one sort or another; and 4 are said to hold MS degrees.

CTTs average one per EEA, with a range of 1 to 3. DGPIST is responsible for the technical support of CTTs, but they report directly to the EEA station director. Certain CTTs -- usually the DGPIST Coordinator at each station -- are designated to work directly with MINAG extension, as well as other clienteles. To date, 25 of the 34 individuals have been thus assigned, in rough correspondence to the nation's 24 departments (DGPIST/Lima 12 June interview).

However, the evaluation team found that, understandably, CTT coordination with MINAG has been at best patchy, for a number of reasons. One is the general lack of operating funds in both INIAA and MINAG. The latter, for example, has received a total of only $19,000 of the $1,500,000 per year budgeted to it under PL480 funds at the beginning of ATT. Coupled with massive confusion over the national regionalization/decentralization plan for agricultural RAD&E, the MINAG extension system is, in the DG's own words, "...a mess."

Moreover, both MINAG and INIAA are still experiencing the aftershocks of repeated SUTEP strikes and considerable bitterness over the restructuring's division of equipment and well-trained personnel. By all accounts, INIAA kept the lion's share of these resources (and wrangles are still on-going, e.g. over seed and soil labs possessed but not used by CDRs). Morale among extensionists has reportedly hit an all-time low as, first, they were transferred out of the better-endowed and more prestigious INIAA, and second, as many now face further dispersal into regional agencies with even fewer resources and still more uncertain futures than MINAG.

Finally, in both INIAA and MINAG, hyperinflation has not only eroded the value of the two institution's limited funds. It has also triggered ever-increasing resignations and voluntary retirements among many of the best-trained employees, as people seek more lucrative work elsewhere. One EEA director fears that "At this rate, we may be left only with the 'mongoloids'."

A corollary of these upheavals in both institutions is an increasing proportion of new, inexperienced hirees with little or no educational background in TT. Another is ludicrous re-shuffling of personnel or doubling up or tripling of positions. For example, accountants have been transferred into communications positions, with predictable outcomes for the quality and content of TT print and broadcast materials. And sometimes a single individual is found simultaneously serving as Station Superintendent, DGPIST CTT, and PROSEM Seed Coordinator (next section).

Given all the foregoing considerations, it comes as no surprise that coordination between INIAA and MINAG, and/or transfer of technology from CTTs to MINAG extensionists, appears quite limited. The few such activities that do occur seem to take place almost exclusively when a special program or a third party provides funding.

For example, according to field interviews, INIAA TT personnel and MINAG extensionists sometimes collaborate in delivering practicuums to PATs on technology for improved cultivation of a given crop. Illustrating from Chiclayo and Cajamarca, several such courses have been jointly funded by entities like: grower associations, private research institutes, and donor projects that focus on the crop in question -- e.g., respectively, the Comite de Productores de Maiz y Sorgho, FUNDEAL, and the SEINPA potato project of COTESU; agribusinesses like Basf, Bayer, and Shell; CONCYTEC; wealthy farmers; and innumerable international (e.g., CARE, PNUMA, PRATEC), local (e.g., CICAP, EDAP, departmental Corporaciones de Desarrollo), and religious-based (e.g., the Catholic church's CESDER and DAS) NGOs. Also, regional ag university professors often contribute their time and expertise gratis.

Clearly, at least some CTTs and EEAs have been very aggressive and inventive in attracting resources with which to continue their TT work. However, seeking out third-party funds absorbs considerable time and energy. More importantly, the result is haphazard TT that primarily responds to the funding agencies' interests -- rather than systematically relaying NRP and other research outputs. A summary of DGPIST/Lima commentary captures the essence of INIAA/MINAG quandaries.

Even with all of these [and other] efforts, ATT will never reach its TT goals because of the lack of integration with MINAG... The big flaw in ATT is that there is no obligatory bridge to MINAG. A mechanism must be put in place to...link ATT-INIAA with MINAG extension. So far, MINAG has not been involved either materially or conceptually in ATT. You could be doing fabulous things in research and TT, but if extension is not involved, they will never be delivered [to producers].

In sum, the achievements of and future prospects for CTTs -- and TT as a whole in Peru -- are murky. Until budgetary outlooks for INIAA and MINAG are clarified under the new government, until staff turnovers slow, and until some of the dust settles from the regionalization of INIAA and MINAG installations and personnel, the evaluation team suggests a "go-slow" approach to training for CTTs.

CTTA. One of the few bright spots in an otherwise dismal TT picture is CTTA. In Honduras as well as Peru, CTTA has successfully pioneered effective yet inexpensive TT strategies emphasizing bottom-up, producer-generated research foci (akin to CIP's "farmer-back-to-farmer" approach to ATG&T) and featuring the application of mass communications to transfer of user-tested technology (Coutu et al. 1989).

Since September 1989, CTTA has worked with ATT, furnishing preliminary training in its ATG&T model and methodologies to CTTs and DGPIST diffusionists and communicators at 12 EEAs, along with MINAG extensionists in the station environs, plus still other groups (Appendix E, Table 2). In some cases, too, MINAG extensionists have collaborated with CTTs in conducting CTTA diagnostics of producers' ag technology needs and problems.

All INIAA/Lima interviewees and all CTTA field trainees interviewed felt that CTTA methods are the key to Peru's TT needs. At the same time, however, all trainees indicated that the 2 or 3 courses they received in the space of (in most cases) less than a year were not enough to fully grasp and be able to independently implement the CTTA process as a whole. The accuracy of this assessment was manifest upon examination by the evaluation team's communications expert of some of the TT flyers and radio programs that new trainees had produced.

Ideally, therefore, CTTA should continue and consolidate its work with those of the 12 EEAs (and their MINAG counterparts) definitively slated to remain within the INIAA system. Ideally, too, CTTA training should ideally be extended to all major EEAs in the system. (However, note that no further CTTA investments in EEAs scheduled for regionalization should be made at this point.) This training should be conducted jointly with INIAA CTTs and MINAG extensionists, and it should emphasize the CTTA diagnostic process (as versus merely its communications strategies). This emphasis will help sharpen and prioritize EEA research and, with it, the relevance of TT to producers' real-life problems.

Continued CTTA training is desirable, lest investments made to this point be lost and lest the impetus toward full institutionalization of the CTTA process as an integrated national approach to TT be halted. In this regard, it is important to note that the CTTA methodology has been adopted not only by INIAA. According to the MINAG Extension Director, it has also been built into MINAG's

recently published extension manual (Ministerio de Agricultura 1989).

Equally important, UNALM is interested in incorporating the CTTA methodology into its extension curriculum. This could be effected via: CTTA seminars and/or workshops at UNALM; fieldwork internships for extension students with CTTA; and thesis research under CTTA auspices on aspects of the CTTA methodology and its implementation. This "transfer" of a TT methodology is very timely, as CTTA has just published a detailed training manual based on its Peru experiences. Such low-cost opportunities as that offered by UNALM for further institutionalizing this extremely promising TT model should be seriously explored.

However, as noted in the section on CTTs and in the summary remarks below, there is some question about the financial and empirical feasibility of conducting systematic TT activities with and through INIAA and MINAG at this time. An alternative would be to put CTTA to work with private-sector grower groups like those of ONA. This move is appealing because it would further a unified cross-sectoral approach to TT in Peru. There are exciting prospects for instituting the CTTA approach among groups like valley grower committees. An example is the Lambayeque branch of CNPA. It has maintained its own TT staff (3 ingenieros agronomos and 4 tecnicos agropecuarios) for the past 10 years; in addition, for the past 4 years, an in-house journalist and radio announcer have produced its daily half-hour radio program, "Amanecer Agrario."

Aside from the obvious advantages of linking CTTA into such groups, INIAA CTTs and MINAG extensionists in the environs could benefit by continuing to participate in CTTA training, diagnostic, and communications design work with grower groups. This combined strategy would help maintain CTTA's impetus in the public sector, at the same time providing the additional hands-on experience that CTTA trainees to date require to complete their understanding of its TT principles and practices.

Whatever other options are implemented, in any case CTTA collaboration with FUNDEAGRO's commercial TTEs should be suspended, for a variety of reasons. For one thing, few of these enterprises have yet identified the precise technologies they hope to extend. More importantly, working directly with grower groups provides a better "fit" with CTTA philosophy and methods. I.e., the CTTA approach is correctly driven by producer needs and farm goals; <u>not</u> by the needs of agribusiness and its profit-making goals. Put another way, the ultimate "private sector" is the farmer/stockraiser her/himself. At some point, the recommendation (Coutu et al. 1989) to test out CTTA's applicability to appropriate elements of the private sector was perverted. The result is that, now, the tail is trying to wag the dog.

Despite this (hopefully temporary) detour, CTTA has made astonishing progress within less than a year (September 1989 to July 1990) in extending its methodology in INIAA and MINAG. Along with its possible future inclusion in UNALM curricula and/or extension of its methodology to private-sector farmer organizations, this bodes wells for the ultimate institutionalization of a TT strategy proven to be effective and cost-efficient even under the immensely difficult conditions of present-day Peru. Thus, when (or if) the GOP gets serious about TT and extension, a workable and fully field-tested transfer model will already be in place.

Coordinadores de Semillas (CSs)

This second group of TT personnel was constituted only as of March-April 1990. It is presently composed of 18 INIAA ingenieros agronomos (16 male, 2 female) posted to the 18 EEAs identified as priority sites for PROSEM operations. These CSs were named by EEA directors from among current EEA employees and in consultation with the PROSEM director, located in DGPIST/Lima.

PROSEM is ATT's newly revised program to promote more widespread use of improved seeds nationwide, with INIAA providing most foundation seed. According to DGPIST/Lima, PROSEM was formally constituted in October 1989, building upon seed activities that have been underway in the public sector since as early as 1942. PROSEM is designed to strengthen INIAA's seed work and outreach, and to function in tandem with ATT/FUNDEAGRO's creation of private-sector seed companies and departmental seed committees, to ensure better quality control (see relevant chapter).

As of the time of the midterm evaluation, PROSEM was only beginning operations. Currently, it is working to establish "seed units" in 4 EEAs, with plans for approximately 6 more in 1991, and another 8 or so in 1992. Hence the 18 CSs. Reportedly, about 80% of CSs have done post-graduate studies, and 2 hold MS degrees. Two CSs have now received ATT-sponsored specialized courses in seed production at CIAT; two more are scheduled to depart for CIAT in July 1990; and similar training is projected for the remaining CSs as new seed units are established. Across the past two years, all CSs have also been given project short courses in seed quality control and seed production and marketing.

Both DGPIST/Lima and EEA interviewees state that CSs are (or will be) responsible for supervising and coordinating the production (including contracting with farmers, universities, or other groups of seed multipliers), processing, and marketing of improved seed under PROSEM. At the time of the midterm evaluation, however, it was not clear to what extent CSs would be truly involved in TT, in a conventional sense. Some EEA officials said that CS functions will center primarily on logistical and administrative matters of seed production and sale. However, the NCSU/MIAC advisor to PROSEM

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indicated that CSs will also mount field days and give training in the production of improved seed.

In sum, with implementation beginning only as of March 1990, INIAA's PROSEM program is still understandably somewhat diffuse and "...a little disarticulated" (DGPIST n.d.:1) More needs to be done to clarify the program's goals and organization, and its projected linkages with other entities. Nevertheless, while it is too early to venture any definitive evaluation of PROSEM's potential for success, the program appears to offer more concrete and positive possibilities than most other ATT efforts at TT.

This may be due to a number of factors: the long history of INIAA seed research and sales in Peru; the reportedly greater level of technical education and personnel continuity among CSs as versus CTTs; a sustainable financial footing grounded in an "untouchable" rotating fund that returns earnings from seed sales to the seed program for purchase of the following year's inputs; and INIAA co-workers' avowed appreciation of the dynamism and commitment of the PROSEM TA.

Moreover, bolstered by successful experiences at CIAT and elsewhere, PROSEM's proposal to establish alternative or "cottage" seed industries in the sierra holds forth real hope of sustainability. Briefly, this alternative industry would involve communities and small farmers in the production, processing, and sale of seed certified by a CODESE as "improved" -- for which no MINAG intervention is legally needed. At the local level, such operations would require little more than some handheld cleaning screens and perhaps some additional bicycle-driven or foot-pedal-powered processing equipment, barrels for disinfecting or dressing the seed, bags, and tags.

Under a best-case scenario, ATT should move forward vigorously with this thrust -- not only in Cajamarca but also in Cuzco Department, where with INIAA stimulus a CODESE has formed itself, following the model of ATT in other departments. At the same time, PROSEM operations in the selva should be strengthened if they can be shown to have a reasonable chance of sustainability. Access to improved seed, and hence perhaps to significantly increased on-farm yields, could play an important role in producers' crop choices and decisioning vis-a-vis coca.

Summary Remarks and Priorities

An overarching problem in ATT is the absence of a systematic but simple monitoring and evaluation (M&E) methodology to reliably measure progress towards logframe goals, as objectively verified by achievement of a 10%-20% rate and a 6-8-year cycle of technology adoption in the sites where it is active. Reportedly, one study has been conducted to establish benchmark TT data in only one site (Chiclayo). Yet at the time of this evaluation, 2 years into the

5-year project, even this lone data set remained to be analyzed and reported. Worse still, for these or any other data, it appears that no methodology has been designed to evaluate project-triggered changes in adoption rates and cycles. The PP logframe merely cites unspecified "special studies" as the sole means of verification for all IIA activities (see Project Paper, Annex II, Exhibit A, p. 12).

This is a serious omission because without organized M&E it is impossible to gauge whether ATT is reaching one of its most fundamental goals or not. This problem should not be ignored for another 8 years, as Malaga and Flores (1989:40) observe was the case with ATT's parent project, REE. Their words apply mutatis mutandis to ATT:

> ...the importance of evaluation...is obvious. Nevertheless , however obvious these needs appear, the follow-up and evaluation system [for REE] was either very weak, or nonexistent... Many of the people we interviewed stated emphatically: 'a better follow-up system is required'; 'control and monitoring is the problem'; 'a method for evaluating the impact is lacking'; 'everyone talks about diagnosis and feedback, but nobody implements them'; there is no methodology for ex-post facto technology evaluation';...and so on" (ibid.).

One useful approach to this longstanding problem might be to utilize CTTA-like formative evaluation techniques. These are highly informative yet relatively inexpensive and simple, by comparison with more academicized methodologies. To complement the more micro-focus of formative-type evaluation, methods also need to be devised to calculate the end-of-project "multiplier effects" that ATT TT "wholesalers" may (or may not) produce by virtue of their outreach to TT retailers.

However, a still larger problem is that fact that at present there is no fully functioning TT and extension "system" in Peru. There is a great deal of hearsay and innumerable documents about who is supposedly doing what where; but the picture as a whole is highly fragmented and, given Peru's present political, socioeconomic, and public-sector turmoil, extremely unpredictable.

Perhaps the most useful major TT activity that ATT could embark upon in the short term would be a meticulous study of what is actually operating (as versus what is written on paper) or could be made to operate, and what linkages are/could be effectively put in place among TT and extension actors in Peru (INIAA, MINAG, NGOs, and member groups of ONA and other similar organizations). The latter assessment should take into account lessons learned from REE and other past projects with TT and extension components. At the same time, ATT would be well-advised to re-think and re-define the TT goals it has for itself in the PP logframe. These goals are

at once very difficult to measure and, in today's Peru, very unlikely to be realized.

ATT AGRICULTURAL COMMUNICATIONS

Also related to TT activities, as well as to research and education needs, are various ATT agricultural communications initiatives aimed at improving the use of and/or accessibility to didactic, audiovisual, and mass media. Activities to be assessed by the midterm evaluation team in this regard were (paraphrased from SOW): updating and consolidating periodical collections in the UNALM library, plus improving library management operations so as to better serve agricultural needs; establishing, promoting, and making widely accessible a broad-based, peer-reviewed agricultural science journal in Peru; developing publishing alternatives among ATT participants, to support TT; and enhancing the use of mass communications for TT and other ag-science-related purposes.

Plans for the first two activities, which center on UNALM, were still in the formative stages at the time of the midterm evaluation due to the considerations detailed in the chapter on human resources.

UNALM Library

UNALM's Biblioteca Nacional Agraria (BAN) has many ambitious longterm plans to fully modernize its operations, including such monolithic tasks as: culling all obsolete materials (already underway); beefing up staff numbers and skills; rationalizing holdings of and subscriptions to scientific journals; bringing all accessioning up to date; computerizing the most active holdings and creating useful databases and other retrieval systems; linking in with national and international database and abstract systems; and expanding BAN user services on a mixed free/fee basis via photocopiers, microfiche readers, and personal computing stations, courses for students on library utilization, thrice annual listings of the tables of contents of journals received, circulation of lists of new acquisitions and other informational materials, and still more (Door et al. 1990).

The price of such initiatives and operations across three years is estimated at $500,000 (ibid.), with heavy recurrent costs during these and all following years. UNALM reportedly will refill 5 library-staff vacancies in July, with salaries already budgeted by the university administration. At the same time, it is thoroughly researching service charges to support the library modernization plan. Nevertheless, the university is looking to outside donors and the GOP for the bulk of funds to initiate and maintain the proposed systems.

For FY 1990 -- the first year of active involvement by UNALM in ATT -- TTA has obligated $66,000 for upgrading BAN: $16,000 for updating selected periodicals; $20,000 for short courses in computer processing for 18 librarians from six institutions (BAN, CDINFOR, CONCYTEC, FUNDEAGRO, INIAA, ONERN); $23,000 for computing equipment and paraphernalia; $3,000 for operating expenses; and $4,000 for salary "pluses" for BAN staff (M. Chavez, pers. com., 15 June 1990).

ATT's next steps in this activity will depend upon a number of factors: the availability of project resources vis-a-vis a tight prioritization of all ATT activities; evidence of significant BAN progress across the next year in updating and computerizing collections and in streamlining library management; and along with a concrete definition of forthcoming GOP and university support for BAN, UNALM's elaboration and economic analysis of specific strategies for making the system sustainable.

If these indicators are positive, ATT-AID/Peru should consider additional modest investments in, e.g.: significant professional training for permanent library staff; funding for some temporary workers so as to accelerate computerization of library holdings;, and purchase of additional but basic equipment. These moves could bring BAN to a point where it could convincingly negotiate with other donors (e.g., Kellog, WB) for a major project to address the library's larger, longterm goals. ATT is not in a position to shoulder this burden itself. Instead, it should deploy its scarce resources primarily as "seed money" to assist in attracting other donors who can follow through with BAN modernization.

Beyond the already-ambitious plans noted above, FUNDEAGRO has proposed a $360,000 plan to create a Sistema Nacional de Informacion Documental (SNIDA) within BAN (FUNDEAGRO 1989X, 1990X), based on various studies and diagnostics (FUNDEAGRO 1989X&X). The goal is to link up national and international information centers using state-of-the-art telecommunications. Unfortunately, such technology is still very imperfect in Peru; and given the nation's tottering communications and energy infrastructure, plus (with very few exceptions) the minuscule budgets, skeleton library staff, outdated switchboard equipment, lack and expense of phone lines, etc. etc. at both regional university and EEA documentation centers, this plan is at present completely unworkable, both technically and financially. In any case, it cannot be implemented until the basic infrastructure and computerized databases and abstracting systems are first in place in BAN.

Scientific Journal

As noted in the previous chapter, the existence of a serious and widely-read scientific journal is essential to ensure the dissemination and use (i.e., the "sustainability") of research results. ATT establishment of such an organ has proceeded slowly,

however. At one point, FUNDEAGRO lobbied strongly to create a new journal of its own, as versus reinvigorating UNALM's Anales Cientificos, which date from 1966 (UNALM/FUNDEAGRO n.d.:1). Presumably the notion of creating an all-new journal from thin air, so to speak, arose because of UNALM's tardiness in joining the ATT "team." Later, UNALM representatives were quite upset by what they perceived as strongarm tactics by FUNDEAGRO to usurp university authority over the Anales.

Reinstituting the Anales has many obvious advantages. The journal has good "name recognition" and prestige within Peru and a natural readership base (minimally, present and past but still professionally active faculty and students of Peruvian ag universities). The Anales also constitute an excellent way to involve UNALM in ATT since the university has a "comparative advantage" in this activity, given its experience in editing this and other scientific journals. Above all, under university (rather than FUNDEAGRO) auspices, the chances that the journal will be "sustainable" are much greater.

By the time of the midterm evaluation, the poorly conceived proposal to start an entirely new journal had been wisely discarded; and apparently FUNDEAGRO had learned to demonstrate a little more sensitivity and respect for the fact that UNALM should properly take the leadership in this activity. At the same time, the university accepted the imperative that the Anales be opened to all agricultural researchers (not just UNALM faculty) on a peer-review basis. The increased pool of potential authors should stimulate broader interest in, and hopefully more subscriptions to, the journal.

Some mechanics remain to be worked out, among them editorial/managerial staff needs and the tenure and precise composition of the editorial board. However, there appears to be consensus that the board be composed of the journal's editor-in-chief (an UNALM personage) and of associate editors comprised of an equal number of representatives from each participating institution participating in the journal effort (FUNDEAGRO, INIAA, UNALM) plus a complement of agricultural scientists of national and/or international repute. Together, this editorial board should represent the specialized scientific expertise necessary to span the gamut of subject matters treated in the journal. In addition, a stable of expert reviewers should be recruited from diverse disciplinary and educational backgrounds (i.e., not all former UNALM faculty or students). Along with the editorial board, reviewers should be listed by name and affiliation in the journal. ATT should not participate in the journal initiative unless there is firm agreement on this broad pattern of board and reviewer composition.

Also to be determined are fee structures that will ensure the journal's longterm financial viability -- e.g., via subscriptions

and submission, page, and reprint charges. Possibilities for tasteful and appropriate advertising should also be explored -- e.g., of new scientific publications (consider contacting international agricultural presses like Westview and Elsevier); domestic and foreign degree programs, scholarships, research grants, etc. (e.g., AID's Becas Andinas, Ford, Fulbright, IDRC, Interamerican Foundation, OAS, Rockefeller, Tinker, various R&D entities in other Latin American countries); workshops, training courses and conferences (e.g., of IARCs and NGOs); and so forth.

In addition, the board should consider occasionally publishing appropriate, high-quality theme issues in which the work of a given project, institution, or subject area is featured in return for a subvention that covers all production costs and includes a substantial service fee. This would help defray recurrent staff and operating costs. To illustrate, scientific research projects like the Small Ruminant Collaborative Research Support Program, which has operated in Peru since 1979 and has an active publications plan, would likely be eager to "buy in" to such an opportunity.

The ATT Educational Advisor to UNALM should be able to assist the university in working through details and options such as those discussed above. If some issues require more specialized assistance, a consultant can be called in (see below). However, all parties involved in the journal should clearly understood that, henceforth, UNALM should have primary authority in journal decision-making, with other institutions taking an actively collaborative but secondary role. After all, UNALM must be comfortable with the format, content, and quality of the journal if it is to place its name and seal on it.

Moreover, a campaign needs to be designed to advertise the journal's new policies and goals to potential readers and authors. Another "must" is a detailed dissemination plan that will target international databases, library acquisitions departments throughout Latin and North America, and publications distributors both nationally and internationally. (To give a few examples of distributor types, in Peru, e.g., the nationwide Studium bookstores, the Instituto de Estudios Peruanos, and the Pastoral Andino system; and for dissemination abroad, e.g., E. Iturriaga in Peru and well-known distribution chains in Argentina and Mexico.)

ATT should defray the cost of this initial, widespread publicization of the journal's reinstatement. Presumably, along with UNALM faculty and librarians, ATT/FUNDEAGRO communications staff can assist in performing a "diagnostico" on which to base the PR and dissemination plans. Informal consultations with knowledgeable IARC communicators and library personnel might also be helpful. Since the PR and dissemination plans will be critical

to the longterm sustainability of the journal, they should be thoroughly professional and as global in scope as possible. If needed, a consultant specializing in international agricultural publishing or library science should be called in.

If the foregoing recommendations are fully implemented, the scientific journal promises to be one of the simplest yet most sustainable achievements that, under the disastrous socioeconomic and political conditions of today's Peru, ATT and AID/Peru could realistically leave behind as a tangible and enduring contribution to the nation's struggling ATG&T system. Because the time remaining to ATT is short relative to editing and publishing timelines, in order to generate significant number of issues before the project ends, all necessary resources should be marshalled to move ahead with this activity immediately.

Publishing Alternatives

Publishing Achievements. Although progress on the scientific journal was stalled for a time, in Lima ATT has been extremely effective in stimulating and utilizing other publishing alternatives.

A signal success is establishment of the handsome, well-edited Revista del INIAA, produced in INIAA's new "CORPAC" publishing offices (next section). The Revista is open to both INIAA and non-INIAA authors, and reportedly boasts a subscription rate of about 800. Between July 1989 and July 1990, five issues of this quarterly magazine have appeared. Together, they feature a total of 110 informative articles on crop and livestock research, TT techniques and achievements, EEA and institutional news, plus feature stories, think pieces, and more (Revista del INIAA 1990). To date, approximately 2500 copies of the magazine have been distributed to the ATT institutions, MINAG and other PATs, researchers, growers, and other interested publics and organizations. In addition, the CORPAC offices have published some 12 TT documents, including a 650-page maize manual sponsored by CIMMYT.

INIAA-La Molina's documentation and diffusion staff have generated 24 technical, TT, or administrative publications (total number of copies = 26,064) between January and May 1990 alone. During this period, too, INIAA produced 196 radio and 189 TV spots and/or programs, and mounted several agricultural exhibits (INIAA Direccion de Difusion Tecnica 1990). Eighty percent of all these efforts were supported through ATT funding.

ONA, too, has generated various publications (see bibliography) and, as noted below, has been especially active in exploiting mass media publishing alternatives. While ATT has not contributed directly to these efforts, in some cases ATT/FUNDEAGRO communications staff collaborated in preparing press releases.

In its first two years of life, FUNDEAGRO has generated over 5 "slick" research publications, plus innumerable flyers and reports on the foundation (see bibliography). Most of these documents pertain to FUNDEAGRO's private-sector initiatives. The distribution system for these items is unclear, however. For example, the nascent TTE ETTASA had received none of the publications dealing with private-sector TT; and "seedsmen" and NRP directors or scientists at a number of EEAs visited claim they have not seen the FUNDEAGRO publications on production of improved seeds.

In contrast to Lima, publications at the EEA level appear to be much fewer than might have been expected, given the stimulus of CTTA. Across the 12 EEAs, TT communications between September 1989 (when CTTA began work with ATT) and April 1990 totaled 31 flyers (20,900 copies printed), 3 learning guides (2250 printed) for direct use by producers, and 362 radio programs. (For detail, consult Appendix E, Table 3.) These figures are lower than anticipated, due in large part to the extreme budgetary constraints that EEAs in general have been experiencing for some time now. With particular reference to CTTA, the first trimesterly budget for 1990 of I/31,000,000 per participating EEA dwindled to only I/8,000,000. Worse still, this much-reduced sum was paid out in March instead of January; and as of July 1990, no further monies for CTTA activities have reached any of the EEAs. Moreover, funds programmed for CTTA at EEAs reportedly were raided to support unrelated DGPIST/Lima operations. In addition, there are concerned reports that, in at least one EEA, DGPIST employees have set themselves up in the printing business, employing EEA diffusion office equipment and supplies.

Ediagro. A forward-looking focus that responds to numerous objectives in ATT's 3b activity area is a proposal that the four ATT institutions launch their own, jointly-owned and -operated agricultural publishing enterprise (Mann 1990) -- sometimes referred to as Ediagro (1990). The logic behind this proposal is persuasive.

First, INIAA's labor union (SUTEP) is constantly on strike. Moreover, there are reports that its documentation center is sometimes improperly diverted to non-institutional uses. To "offset" this problem, much of the print and photographic machinery acquired for INIAA through WB, REE, and ATT has been moved to a less conflicted location (the CORPAC offices), along with outstanding non-union personnel, some of whom have decades of publishing experience. Second, both ONA and FUNDEAGRO have only partial in-house printing and duplicating capacity; both must contract out larger and/or "slicker" jobs. Third, UNALM's print shop is, like INIAA-La Molina's, a veritable technological museum. As UNALM reinstates the Anales, its printing needs will grow.

Theoretically at least, important economies of scale could be achieved in this domain. It would be financially foolish to try to install and maintain full-service publishing facilities and a truly professional editorial and technical staff in all four institutions, much as they might clamor for more equipment and personnel. Instead, the physical and human resources now on hand should be consolidated and their usage rationalized.

In the opinion of all individuals interviewed and in that of evaluation team, there appears to be a large volume of publishing work to be had in the agricultural sector at large, beyond that of the ATT institutions themselves. As one interviewee pointed out, the publishing needs of the BAP alone (which reportedly sends out all its work) are so vast that a contract with this one institution would keep a press busy fulltime -- not to mention MINAG or the innumerable NGOs and international projects involved in agricultural RD&E in Peru.

If Ediagro could tap into even a portion of this market, given good management and salesmanship it should be able to turn a profit. An additional and highly unique service it could offer would be an in-country dissemination plan for clients' agricultural publications. A common problem, whether in Peru or the US, is that research is done and ATG&T materials are printed only to be distributed haphazardly. All too often, they do not reach the hands of those who could put the information to best use.

To verify the existence of a substantial market for Ediagro, a thorough-going, external technical-economic feasibility study should be conducted. Among other things, the study should examine the relative efficiencies of shopping out expensive specialized tasks for which the proposed conglomerate enterprise would not be equipped initially. (For example, the Revista del INIAA currently meets most of its photographic needs out-of-house). Only very modest additional purchases of basic critical equipment (e.g., a mechanized paper cutter) that is unavailable among any of the collaborating institutions are recommended for Ediagro startup. The initial focus should be upon building a name and a market, while testing out the enterprise and carefully calculating its growth potentials. The same study should also assess the feasibility and viability of a downscaled version of the Agropress proposal (next section).

Constituted as a non-profit enterprise, Ediagro's surplus earnings could be used not only to upgrade facilities, salaries, etc. but also to subsidize additional agricultural publications of interest or value to the cooperating institutions, as well as scholarly texts and translations.

During a meeting of the evaluation team with communications staff of INIAA, FUNDEAGRO, and UNALM, a committee was named to investigate how such an enterprise could be institutionally

organized. Unquestionably, the legal and inter-institutional design of this enterprise will be a thorny issue. Who will contribute what equipment, goods, or locale? How will rights and royalties be assigned? What proportion of earnings could be earmarked to support important but typically money-losing scholarly texts and translations? What kinds of incentives for authors of these and other desirable materials can be devised? How will management and accounting responsibilities be divided in such a diverse enterprise? And so on ad infinitum.

At present, given that such questions remain unanswered, reactions to the Ediagro proposal are mixed. As author of the idea, FUNDEAGRO is enthusiastic; ONA agrees in principle (Caballero 1990); UNA is cautiously interested; and INIAA is of two minds. Despite these challenges, the idea should be pursued. On the brighter side, the main actors involved have known each other and, in some cases, worked together for years.

The longer-term goals of the Ediagro proposal are to establish a non-profit (private or mixed) enterprise that will serve as the nation's first agricultural publishing house. As discussed for Anales above, this activity could leave behind a major, self-sustaining center of excellence for the production and transfer of agricultural information of which ATT and AID/Peru could be justifiably proud -- particularly if the Agropress service (next section) is folded into the Ediagro design.

To move decisively to turn this idea into reality, the evaluation team recommends two steps. First, the relevant decision-makers of the four institutions should all present letters of intent attesting to their commitment to the idea, along with one or more scenarios of how they might envision organizing the enterprise. These documents should indicate a sincere and unequivocable commitment to inter-institutional collaboration. If this step is not satisfactorily completed, then both the Ediagro and the Agropress (below) ideas should be tabled. Secondly, if there are still some legal or financial details that the committee itself does not have the expertise to resolve, then the NCBA or possibly the IESC can be contacted to provide a consultant skilled in technical aspects of publishing houses (and ideally also press agencies) as well as in arbitration, so as to hammer out these details. Also, an expert(s) in Peruvian business, broadcast, government, and copyright law will be needed to work with the NCBA consultant and the committee.

Use of Mass Communications

Agropress. Another exciting proposal put forth only three months prior to the midterm evaluation is establishment of an Agropress that, like Ediagro, would respond to a number of ATT's 3b objectives -- especially those pertaining to "...better technology information flowing to popular agricultural oriented magazines,

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newspapers, broadcasts, and other mass communications media, aimed at a wide clientele spectrum (i.e., consumers, farmers and technology transfer agents)" (cited in Mann 1990:2).

As noted in FUNDEAGRO 1990X, the ATT institutions lack an adequate or systematic capacity to fully exploit the quite substantial national network of mass media that deal with agricultural subjects (APOYO S.A. 1989a,b,c). Perhaps UNALM is most lacking in this regard. In contrast, ONA has done a very impressive job of utilizing national and regional newspapers; and INIAA appears to have a dedicated core staff that for some years has produced agricultural radio programs for distribution in cassette form. With CTTA's incorporation into ATT, these and other mass media TT efforts have been further reinforced.

The larger point, however, is that conducting agricultural research or devising new, more effective TT methodologies has little value unless the results are broadly communicated and actually put to use (NCSU 1988:55). With credible, scientifically precise, timely, and professionally packaged press and broadcast releases that are appropriately translated from scientific (or juridical) parlance into popular terms, Peru's mass media can play a powerful role in stimulating public awareness of, and possibly more GOP support for, the ATG&T system. As Coutu et al. 1989 observe, in a nation as politically conflicted, economically precarious, topographically rugged, and climatically variable as Peru, the importance of enlisting the mass media in service of TT and other ag-sector information needs cannot be overestimated.

An Agropress could go far toward processing and funneling such information to the media. The proposal presented to the evaluation team hopes to garner financial support from several sources, including the national newspaper El Comercio, a private TV channel (No. 5) and its daily "Agrovision" program, and the Asociacion Nacional de Periodistas Agrarios del Peru (membership = 76). The plan is very ambitious, involving training for ag journalists, elaboration of styleguides, coordination with numerous entities (the ATT institutions, MINAG, BAP, regional governments and ag universities, TT and other ag sector enterprises, CODESEs), and creation of a nationwide network of agricultural press correspondents. Like Ediagro, Agropress is to be established as a NGO.

There is much merit in the general idea of an Agropress -- but only to the extent that it can be shown to have a realistic chance of becoming self-sustaining. There is some evidence that the media are hungry for well-packaged agricultural material, and might be willing to pay for it. As with Ediagro, other possible clienteles are projects and institutions who may contract for specialized services such as slide- or video-tape and cassette production, editorial expertise, and maybe translations and dubbing.

However, at least as presently designed and for its initial formative stages, the Agropress proposal is overblown. It needs to start more modestly and search out many more efficiencies and synergisms with other ATT-related activities. For example, it should explore collaborative links with MINAG, which reportedly may have a full complement of new audiovisual equipment that is not being utilized. Likewise, ways to build in INIAA's radio broadcasting crew and equipment should be considered. Otherwise, wasteful competition and duplication of media efforts may result.

The evaluation team would urge that the Agropress and Ediagro efforts be combined. While admittedly they constitute two different kinds of communication efforts, there are many points of overlap. A combination offers numerous potential efficiencies.

First, cost-savings could doubtless be realized on rent (if any), energy bills, vehicles, phones, faxes, photocopiers, etc.; on certain types of typesetting/computer and photographic equipment common to both enterprises; on secretarial and managerial staff; and so forth. Second and relatedly, skilled editorial and certain technical personnel can be more fully deployed in both the publishing and the press end of the business. Third, locating Agropress inside a center engaged in producing the most up-to-date ATG&T publications should give it an "inside track" in, e.g., gathering timely news items, expanding press professionals' access to and understanding of scientific materials, suggesting ideas for in-depth interviews and feature stories, etc.

Adopting this suggestion, the stringent technical-economic feasibility study recommended for Ediagro should include the Agropress, building upon the diagnostic information already gathered by ATT/FUNDEAGRO on the supply and demand for agricultural information in Peru. The consultants employed for Ediagro can simultaneously address Agropress needs and organization. USIS/P personnel might also lend some informal advice and support.

The evaluation team recommends that ATT and AID/Peru move forward with this idea, adding modest resources to initiate it, if the following conditions can be met: the four institutions reach agreement on the Ediagro/Agropress enterprise and what their respective contributions and benefits will be; Agropress market and feasibility studies are positive; and the financial and reportorial support of relevant private-sector entities (radio and TV stations, professional ag journalists, etc.) can be clearly demonstrated.

Among other important agricultural issues, a professional and dynamic Agropress could focus a powerful lens on the coca question, raising national consciousness about this issue, highlighting agricultural options and successes in crop and livestock substitution, reporting opinions and concerns from coca-growing zones as well from consumers of traditional coca products (e.g., tea, traditional medicines, as a restorative chaw, or a critical

part of ritual and social life, etc.), and mounting educational and feature productions on the subject for consumption both in Peru and abroad.

Summary Remarks and Priorities

ATT's agricultural communications thrust represents one of the most unique and pioneering aspects of the project as a whole. All too rarely do ag development programs pay proper attention to this absolutely vital part of the ATG&T system. Yet a well-conceived and executed ag communications plan can go far toward realizing the PP goal of "Increasing the awareness and appreciation by Peruvian farmers, agri-businessmen, government officials, and the general public of the importance of ATG&T to the economic and social well-being and progress of Peru" (AID/Peru 1987:30).

Such efforts gain especial importance in Peru given that a principal constraint to increasing the nation's agricultural outputs and incomes is not so much a dearth of research information but rather failure to transfer what is already known and proven useful (AID/Peru 1987:17). ATT and AID/Peru should be roundly applauded for their far-sightedness in this realm.

Under the present conditions of great socioeconomic and political uncertainty, initiatives like the scientific journal and the Ediagro/Agropress could well prove to be among the most perduring and sustainable contributions of ATT to ATG&T in Peru. Moreover, the Ediagro/Agropress enterprise constitutes a particularly innovative TTE model. However, if pressed for time and money, ATT should focus first on the scientific journal. It is by far the most "do-able" of these tasks and the most likely to endure as a tangible landmark of ATT-AID/Peru achievement.

Care should be taken throughout the LOP to closely document the evolution, functioning, and impact of all ATT communications initiatives, in such a way that other missions and projects will be able to profit from the Peru experience. If successful, these thrusts could stand as a model of achievement in agricultural communications in the developing world.

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CHAPTER III

Private Sector

III. PRIVATE SECTOR

A. BACKGROUND

1. Purposes of ATT in the Private Sector

The Project Paper statement of purposes indicates a number of fronts on which the private sector will attack the project goal, "to expand the scope and improve the quality and relevance of agricultural technology being generated for agriculture, and of technology transfer services". They are best summed up by a rather heterogeneous list of general outputs, and followed by a more specific and largely quantifiable list of outputs for each of the counterpart institutions. The former will be listed here; more specific outputs will be introduced in other sections of this chapter. But it should be clear at the outset that they refer, for the most part, to actions by the public sector, on the assumption that macroeconomic policy in Peru will be conducive to a favorable business climate and to private investment in the agricultural sector and in the activities which supply it.

These outputs (purposes) are:

- Analysis of primary production problems which might be solved by profitable technology in commercial use elsewhere;
- Technology which has been introduced, tested, adapted, and validated on the farms and demonstrated to others;
- Linkages established with faculty and staff at UNA and regional universities or other research organizations;
- Documented improvements in the efficiency of use of public sector research and extension sources;
- Identification of priority of private sector technology problems;
- Existence of the Statistical and Analysis Center in ONA;
- Adoption by farmers of technological changes as the direct result of activities by enterprises established.

With regard to the seed program incorporated in the above, the Project also has some quantifiable results, under the assumptions that: "(a) INIPA and UNA will divest themselves of certified seed production activities; (b) Any required regulatory changes will be forthcoming to encourage self-regulating private sector certification programs".

Evidently all of these outputs overlap the other components of the project and cannot be discussed exclusively in the context of private enterprise development. Here we focus on technology transfer enterprises (under development with support by both FUNDEAGRO and ONA), other services provided by ONA, and the seed program.

2. Chronology

The most significant event during the LOP was separation of the extension service from INIPA to MINAG in 1987-88. Under INIPA, there was administrative layering over both research and extension personnel, leading to their physical separation and lack of joint effort. When the extension units were split among 203 Centros de Desarrollo Rural (CDRs) -- and merged with units dealing with water, forestry, business management, family life, etc. -- the centrifugal trend was accelerated. Extension agents now spend much of their effort gathering statistical data or working with family units on non-agricultural activities, with no formal means and little time to learn of INIAA research and act as the link between research and the private-sector producer. Spinning off numerous INIAA research stations to the Departmental Governments under which CDRs are organized, has not really solved the problem, since the highly skilled researchers were not spun off with the stations.

Further compounding this problem has been a drop in appropriations to the extension service since 1988, making it difficult to meet payrolls, much less carry out effective training and maintain equipment. Of two hundred pick-up trucks assigned to the service, one-third are inoperative; the same ratio applies to motorcycles.

As explained below, an institutional base already existed within ONA in which new and ongoing ATT activities could develop. FUNDEAGRO, on the other hand, did suffer from problems deriving from overall organization and cash flow which have impacted both its enterprise development and seed programs. These are discussed above.

Finally, none of the assumptions concerning the private sector component of the project can be qualified as unequivocally holding so far during the LOP. GOP macroeconomic and foreign exchange policy hamper private investment and raise the cost of inputs, particularly in the agricultural sector. They have also brought new lending by the multinational agencies to a standstill. Peruvian public and private bank credit has met less than half of capital requirements in agriculture. Price controls and state marketing of agricultural products have further squeezed returns to farmers. State enterprises and UNA continue to produce and/or market certified seed in competition with private seedsmen.

3. Appropriateness and Feasibility

In view of the major gaps in Peru's technology transfer system, originating in large measure from the problems of definition of its mission, organization and under-funding of the extension service, the outputs (goals) listed above are all appropriate. This is especially true in the context of developing viable alternatives to the extension service which is now virtually the sole transfer institution. On the other hand, it is asking too much to expect the ATT project to come to grips with all of the deficiencies of the extension service (the fourth output listed above). This point has to do also with motivation of farmers to do on-farm "introduction, testing, adaptation and validation of technology". Both supply and demand factors, external to the project, may limit results in this regard no matter how well designed the project is. Promoters and implementers of TTEs, and seed producers could turn out to be incompetent or worse.

These same questions carry over into considerations of project feasibility. Project back-up and capital resources, thinly spread at best, might be inadequate in times of crisis -- most especially in view of lack of financial support by other international agencies and the Government of Peru. Thus the lack of overhead and complementary investment may hamper enterprise development which would otherwise have succeeded with project support.

B. TECHNOLOGY TRANSFER ENTERPRISES (TTEs)

1. The Program in Brief

FUNDEAGRO has sought to develop or assist existing private enterprises which sell goods or services to agricultural producers. In its promotional materials concerning this program, FUNDEAGRO states that it will accept applications from a variety of institutions: among these, private firms, professional associations, producer organizations, NGOs, foundations, funds and other types of sponsors.

With such a broad base from which to identify and select TTEs, it is understandable that procedures for doing so cannot easily be codified. In 1989, FUNDEAGRO held what was to have been a series of regional conferences, inviting potential sponsors from the four northern departments, from which it received twenty applications, selecting three from among these. Thereafter. FUNDEAGRO preferred to approach potential sponsors at other sites in order to attain the remainder of its current potential portfolio of TTEs. A Selection Committee -- comprising the activity coordinator, the national advisor, the private enterprise development advisor to the ATT Project and one external advisor -- make the final selection of a project.

Once a sponsor has been identified, FUNDEAGRO procedures require documentation, leading to a feasibility study, which must show that the TTE will be financially viable within three years in order for the candidate to receive start-up assistance. Various means may be employed by FUNDEAGRO to provide resources to a selected TTE, prior to signing a formal memorandum of understanding to grant start-up assistance over a three-year period. This "promotional" investment may include funding marketing and feasibility studies and training grants, and assignment of contract technical personnel to the TTE candidate. These promotional costs are not reimbursable to FUNDEAGRO, and by year-end will amount to $582,000 (exclusive of management overhead) or nearly $60,000 per grantee.

Following signature of a formal memorandum of understanding (none such has so far been signed) all such grants will be required to reimbursed in full, in real-INTI terms. Required contributions by the assisted organizations (40%) are established in the regulations, as well as appropriate safeguards against undue profits. Also laid out are provisions for amortizing the cost of grants-in-kind. What is contemplated is underwriting a share (not specified in FUNDEAGRO regulations, but 60% is implied by the above) of operating costs during start-up of the TTE -- including equipment, personal services and supplies provided. According to FUNDEAGRO staff, the memorandums will require adherence to a number of very specific conditions, concerning work plans, development of administrative structures and procedures, format and timing of financial statements, etc. The evaluation team was not shown a set of regulations which fully spell out these conditions.

As of August 1990, FUNDEAGRO's technical advisors assigned to individual TTEs will be replaced by a smaller cadre of business administrators, some of which may have to serve two or more TTEs.

Eleven TTEs have been brought into the system, and ten are in various stages of development. If all these TTEs were to become going concerns by EOP, FUNDEAGRO would have achieved its goal in this regard. Of the eleven, six have signed preliminary promotional agreements, four are in earlier phases of development, and one has been dropped. It should be noted that all of the TTEs are located on the Coast. This is understandable, since the likelihood of TTE firms becoming self-sustaining in commercial agriculture is much higher than elsewhere. Only one of these firms has received third-party financing (Banco Agrario).

Total financial requirements of all the TTEs during start-up cannot be ascertained at this time. However, if FUNDEAGRO were to adhere to the 60:40 ratio of support to firms which have graduated from the "promotional" phase, using funds programmed for this activity during the period 1991-93 ($581,600), disbursements would break out roughly as follows:

		($000)
1.	Management overhead	50
2.	Field Development and promotion	90
3.	Selection of TTE firms	45
4.	Other promotional expenses (studies)	20
5.	Operational support to on-going enterprises	240
6.	Training, technical support	140.

2. Description of TTEs Visited

The evaluation team has visited five TTEs. Two of these have been constituted as legal entities but not yet commenced operations, and three were in existence prior to the ATT Project. Thus, we seem to have a cross section, if not a representative sample. The firms visited are:

1. Comités de Productores del Valle del Chira (SENSA CHIRA),
2. Fondo de Fomento Agropecuario de Chincha (FONAGRO),
3. Cooperativa Agrarira de Usuarios La Esperanza-Huaral,
4. Associación de Profesionales Agrarios de Lambayeque (APALAM).
5. Cooperativa Santa Rita de Siguas (CSRS).

SENSA CHIRA has not initiated operations and shows a lamentable lack of direction. It would like to do IPM in the Chira valley and has hired an entomologist (paid by FUNDEAGRO) to this end. SENSA demonstrates very little marketing skill. FUNDEAGRO has funded, in addition to the entomologist, a workshop with the University of Piura, and two short-term consultancies in preparation of a market study. In process is an in-depth market study (for which the enumerators are to be paid by SENSA), to be followed by a feasibility study.

It is too early to forecast the outcome of these preparatory steps, and it remains to be seen to what degree all this information and analysis can be translated into SENSA CHIRA's operations. The firm is currently demanding that FUNDEAGRO cover all of its expenses for the first six months of operations. The only way to save it may be to require it to merge with one of the existing consulting firms in the area -- all of the representatives of rice, cotton, corn, sorghum, and fruit and vegetables committees represented on the board of SENSA CHIRA should make it a valuable acquisition where it may make a contribution to the area under new management.

FONAGRO (est. 1980) currently seems to be operating in the black, although the evaluation team did not examine financial statements. It is involved in production and marketing of cotton, marketing of improved cotton seed and of asparagus crowns, and sale of soil testing and other technical services to four cooperatives (220 farmers) through its Technical Assistance Department. FONAGRO also expects to market inputs and will add a farm records and farm management analysis services.

FONAGRO expects to lose money in the coming year on technical assistance because a major portion will be given away as "promotion". For the same reason, it will only break even on sales of seed, beneficial insects and asparagus crowns. But it expects to make money on agricultural sales from the 54 ha. which it works. Thus there is an overall profit potential in FONAGRO, and possibly, in its technical assistance activities as well.

FUNDEAGRO has already provided

- two courses on management
- seven technical courses on various subjects
- a market survey
- a study on rehabilitation and equipment of its insect production facilities
- a study of grape production possibilities
- a profile of a packing shed
- the services of a field technician

FUNDEAGRO is providing a soil testing lab with which to back up FONAGRO's technical assistance operations. FUNDEAGRO will also provide a market survey for technical assistance within FONAGRO's area and a management advisor.

CAU La Esperanza makes money, by providing spraying and weed-control services to seventeen fruit and vegetable growers through its Department of Technical Assistance. It expects easily to recoup its investment in a 8-ha. tree nursery acquired this year. The cooperative's profits ($12,000 over an unspecified period -- the cooperative is 60 years old) are lying in a non-interest-bearing convertible account from which it hopes to earn financial profits.

La Esperanza has received from FUNDEAGRO

- two courses in management
- four courses in various technical subjects
- two special studies (general productivity, passion fruit culture)
- three visits to experimental stations and to CIP
- the services of a field technician.

This year La Esperanza has become a marketer of passion fruit (to a juicing firm in Chanchamayo), claiming success in negotiating a higher price for cooperative members (of which, 240). La Esperanza now wants to pack and market a broad range of fruits in Lima and elsewhere, acquire a packing shed with processing equipment, process passion fruit juice and install long-term cold storage facilities. The cooperative has its eyes on a government-owned packing shed built with Spanish foreign aid, with expensive single-

purpose equipment -- all of which is much too elegant for La Esperanza's current needs.

The cooperative plans to dock its members 10% for performing the marketing function and offer non-bearing shares to them in return, instead of offering profit-sharing from the outset of this new line of activity.

This whole procedure needs to be re-thought before FUNDEAGRO becomes involved with this shift in the focus of the cooperative. First, the new marketing venture must be phased in with a degree of foresight. Second, staff already possessing marketing skills must be acquired from outside the cooperative. Experience has shown that the vast stock of information and contacts required to market perishables cannot easily be acquired by any other means. FUNDEAGRO must disengage from this area of the cooperative's activities and insist that it be protected in case La Esperanza loses its small savings and/or seriously alienates its members on a series of ill-conceived or ill-timed market maneuvers.

APALAM was formed as a legal entity in 1989 by twelve independent agronomy consultants in Lambayeque. It wished to perform consultancy services and signed an agreement with FUNDEAGRO in the same year. This was followed by a FUNDEAGRO-funded feasibility study. The study found that APALAM should sell product marketing services, and serve as intermediaries in the sale of machinery rental, inputs and soil analysis. The study reported that 1,686 producers in the area would be willing to pay for these services. The study proposed an investment of $68 thousand and projected net returns to the business of $75 thousand after five years. FUNDEAGRO thereupon initiated the process of obtaining the required funding from national institutions, including owners of agricultural machinery for rent, input suppliers and other agro-industries. To date, in addition to the feasibility study, FUNDEAGRO has paid for (1) a refresher soils science course and (2) transportation to attend a cotton production short course. The evaluation team found that APALAM's officers show little comprehension of the business plan outlined in the feasibility or of its financial implications.

Cooperativa Santa Rita de Siguas (CSRS, est. 1920) became a cooperative in 1980 and signed an informal promotional agreement in 1989. It wishes to provide technical assistance with regard to agricultural mechanization and produce animal feeds. The cooperative members (94) produce milk and fruit. FUNDEAGRO has to date funded: (1) an animal health study; (2) a diagnosis of agricultural possibilities; (3) a soils and range grass analysis; (4) diagnosis of fruit production possibilities; and (5) the services of a field technician.

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3. Conclusions

The evaluation team wishes to comment on the very high cost of this program per TTE assisted. This is attributable to a variety of factors:

1. inclusion of some dubious ventures within the portfolio of clients;

2. improper definition of technology transfer, to include production and marketing activities by the firms assisted;

3. weak and ineffective management of the program by FUNDEAGRO staff, leading to failure to insert cost-sharing or recovery provisions into "promotional" assistance.

Judging from the sample of firms visited, it appears that there may be a number of failures among TTEs visited. When signs of failure are clear, FUNDEAGRO has given no indication as to at what point it intends cut its losses.

On the other hand, it is clear that the major emphasis throughout the remainder of the LOP must be on management, a suit in which all of the TTEs observed are dangerously weak. While there has been some support by FUNDEAGRO in this regard (management short courses for existing personnel) there is little on the credit side with regard to seasoned, hard-hitting management talent. FUNDEAGRO plans to address this problem during the next few weeks by replacing its technician-advisors to TTEs with management advisors.

4. Recommendations

The program seeks to develop technical assistance institutions or assist existing ones to reach a point at which are able to cover costs in limited areas of influence along the coast. There is no effective way of judging the extent to which this initiative will be successful. But it should be clear that the program could become more cost-effective. The evaluation team considers the following to be essential components of a much-needed process of restructuring the program:

1. Some of the TTEs now have competitors for their services (suppliers, other private consulting firms, the farm management activities sponsored by ONA) whose activities may be curtailed by TTEs. They too should be given a chance to participate in the program at some time.

Under current operating procedures, some effective operations have doubtless been frozen out of the system. With the exception of the four northern Departments, FUNDEAGRO has pre-selected its clients instead of opening the program to competitive bidding. Also, it has spent so much of its budget on promotional (pre-operational)

activities that it could not afford to bring in any more clients. What FUNDEAGRO could do at this time would be to hold conferences of interested potential clients in the southern and central Departments in order to develop a backlog of potential clients, both to have replacements in case some of the existing clients fail and to justify funding for this purpose by the ATT project.

2. The procedures allowing for nonreimbursable promotional expenses could be tightened up. At the very least, these could be made partially reimbursable, as a form of "ticket stopper". For example, the client could be made responsible for a higher share of survey expenses than the minor cost represented by enumerators, both to save on FUNDEAGRO's promotional expenses and to interest the client to a greater extent in the results. 50:50 cost sharing, or up-front payments in full, would contribute to these objectives. Similar arrangements could be worked out concerning some training activities on a case-by-case basis, depending on the client's ability to pay. Timing of payments for services might depend on seasonality of receipts by these TTEs over the crop cycle.

3. The overall question of cost-sharing and recovery by FUNDEAGRO is difficult to discuss because under A.I.D. regulations there is apparently no way for FUNDEAGRO to retain this money on deposit such as to prevent its almost-total loss of value. This enormously complicates its programming for future use. The flip side of this question is that FUNDEAGRO <u>has little incentive</u> to impose cost-sharing or recovery on its clients. If a satisfactory arrangement to prevent this can be developed with A.I.D., then FUNDEAGRO must be applauded for attempting to achieve partial recovery in an effort to ensure its own survival. But it does seem unlikely that complete recovery from all TTEs can be achieved over as short a period as the currently-projected three years. A more flexible policy in this regard is clearly indicated.

4. Long delays in commodity procurement (e.g., soil labs) for this project have contributed to FUNDEAGRO's failure in certain instances to deal fairly and in a businesslike manner with clients. Since commodities represent a minor share of program costs, there is no justification for delays in their procurement.

5. Conversely, no case can be made for husbanding of management talent which must develop within TTEs. The clients visited, without exception, seem to have no grasp of management techniques; and FUNDEAGRO has so far not provided much of a positive nature in this regard. It is unfortunate that unless formal memoranda of understanding are signed before a manager is assigned to the client, his cost is not recoverable to FUNDEAGRO. At the least, preference in placement of

FUNDEAGRO-funded managers should be given to clients who have graduated from the promotional phase.

6. In the installation of a standard accounting system, targeting of company goals and establishment of operating procedures, and advising on organizational questions, the manager must be keenly aware of FUNDEAGRO's overall objectives with regard to the TTE program. This is especially true with regard to peripheral activities (e.g., agricultural production in the case of FONAGRO; La Esperanza's proposed venture in marketing fresh fruit). These activities which have little or nothing to do with technology transfer represent both earnings potential and danger of financial failure from which FUNDEAGRO must be insulated to the extent possible.

Because of the above, the evaluation team views this program, as it is currently conceived and implemented, as a marginal activity within the ATT project. A clear definition of objectives and methods is urgently needed at this time. We recommend that this be done quickly -- within the next ninety days -- so as to minimize the injury of any stoppage of disbursements to FUNDEAGRO's relationships with on-going TTEs, and to prevent waste. Once the appraisal is performed and accepted by FUNDEAGRO and A.I.D., the more doubtful clients dropped from the program, and appropriate changes made with regard to FUNDEAGRO personnel involved, the program might be continued on a reduced scale. We estimates that FUNDEAGRO could operate the program with a reasonable degree of effectiveness, on $250,000 less than the level of funding now programmed for it through 1993 ($581,600).

C. THE SEED PROGRAM

1. General Nature of the Program

World-wide, seed programs effect technology transfer by facilitating the marketing of new varieties (breeder seed) developed either domestically or abroad. A royalty is normally paid for the use of breeder seed in order to encourage research efforts. Foundation or registered seed from that source is multiplied under supervision by farmers specializing in this activity. This results in certified seed, which is the seed of commerce emanating from that variety.

In Peru, the relative importance of certified seed varies by crop. Certified cotton seed from lines bred by various companies and foundations (e.g., FONAGRO) is marketed exclusively by FUNDEAL which supplies 90% of the market for cotton seed. Certified rice seed has heretofore been marketed predominantly by ECASA. But with the removal of that public enterprise's monopoly, the Comité Nacional de Productores de Arroz-ONA has arranged to take over

marketing from ECASA's 12 seed plants. Using ECASA's line of credit with the Banco Central, this system supplies half of the country's certified rice seed. The other half is supplied by private firms which have rushed to supply this lucrative market. Together, the Comité and private firms are producing certified rice seed equal to 50-60% of the country's use. In corn, a similar system exists via an arrangement between UNA and APROSEM; but private firms have now captured 9/10 of the market. The two systems combined account for 40-50% of all corn seed used. Certified seed for bean and other legumes (except soy) are supplied mainly by INIAA through cooperating multipliers, in small quantities in relation to total use. Seed potatoes are even less often certified.

Private seed firms have been impacted by land parcelization, since they now must deal with numerous individual proprietors instead of a much lower number of cooperatives. In 1990, they have also been hurt by a number of other variables. All of the projections in feasibility studies presented to FUNDEAGRO (see below) must now be revised downward.

In sum, the public sector has retreated from the seed business in favor of private commercial firms. But Peru's certification system, designed essentially to serve the public enterprises via MINAG's Comité Nacional de Semillas, has not developed to accommodate the system. MINAG collects a tax on certified seed but exercises no supervision over its multiplication despite its authority by law to do so. Thus if private initiatives had not developed to meet the need for certification, Peru's farmers would have been without any means of obtaining new technologies embodied in seeds, and without protection from false labeling.

It should be clear that the system sponsored by the ATT Project is not the only one that has developed in Peru. In the northern coastal departments, certified soy seed is marketed by the Comité de Productores de Soya; its multiplication is supervised by INIAA's soybean program (which is funded in large part by a private oil processing company which also stores the seed in refrigerated warehouses). The program is financed by the Banco Agrario, and the seed is stamped "certified" by MINAG.

A seed committee, based on the ATT model, has also developed in Cuzco (promoted by INIAA which supervises the multiplication of improved varieties of potatoes). Other systems have been developed there by private initiatives, involving multiplication and distribution of barley and wheat seed, by means of purchase contracts and technical supervision of growers by brewers and flour millers.

The alternative proposed by the ATT seed program is development of a self-policing private system, organized on geographical rather

than commodity lines. ATT proposes the creation of Departmental Seed Committees (DSCs), composed of representatives of

- MINAG
- INIAA
- Banco Agrario
- ENCI
- seed companies
- seed multipliers
- seed salesmen
- farmer-users

Six such committees now exist (Lambayeque, San Martin, Ica, La Libertad, Huánuco, Arequipa).

The seed program has supported these Committees, preparing (1) quality control manuals, (2) technical specifications for seed quality control labs, (3) promotional materials, and (4) courses, seminars and study tours. The program has also sponsored research on behavior, habits and regional attitudes toward seeds in five regions of Peru (Plan Chacras). More significantly, the seed program has hired four technicians, assigned to the Committees in order to provide quality control in the field to producers of certified seed. The system is now functioning for rice (3 departments, whose seed companies are contributing 2% of sales of rice seed to support the program).

Elsewhere, progress has lagged. In fact, none of the DSCs visited by the evaluation team are fully functional. Therefore, at this time there cannot be an sufficient or appropriate input to the program at the Departmental level by either MINAG or INIAA. In part, this is due to weather and general economic conditions this year, which have depressed demand for seed; part is due to lags in procurement by FUNDEAGRO of needed seed lab equipment. Part is also due to shortage of facilities (storage, in particular) of the commercial seed houses, and part can be attributed to their difficulties in obtaining credit to carry inventories. All of this contributes to unwillingness of the seed firms to arrange for financial support of the proposed system. This last does not augur well for the potential self-sustainability of this program in future years.

2. Conclusions

At the outset of the project, it was felt that commercial seed firms would require major support; and total funding of nearly $1 million was programmed for this purpose (in the form of feasibility studies, courses in business administration, and competitive grants of machinery, equipment and civil construction). Twelve project profiles were submitted to FUNDEAGRO in solicitation of these funds, of which six were carried to the feasibility study stage. An elaborate point system was developed by FUNDEAGRO for evaluating

the feasibility studies. Except for studies and courses, none of this money has been disbursed, however, since FUNDEAGRO has developed no mechanism for recovering it in a manner acceptable to A.I.D.

FUNDEAGRO's intent is to use these moneys principally to supplement third-party financing by financial institutions (COFIDE, Banco Agrario, private banks). The evaluation team has strong doubts concerning the ability of FUNDEAGRO-NCSU-MIAC to employ these funds at this time in the role initially envisaged.

Credit is undeniably scarce in Peru. But whether bankers will be impressed by a seed company's coming to them with (in effect) a loan from FUNDEAGRO as a substitute for "own resources" remains to be seen. Seed supply should expand smartly as a result of expansion of the capacity of seed companies. But whether this seed can all be sold at this time also remains to be seen.

There are alternative uses for these funds: (1) working with small farmers in the Sierra to develop inexpensive alternative systems of production and distribution of improved seeds, (2) actively promoting the production by private firms of seeds for range grasses in the sierra and the selva.

3. Recommendations

The line item for competitive grants of machinery, equipment and civil construction for commercial seed firms should be eliminated. Alternative uses include those listed above, which would require a minimum of funding. This reprogramming requires some input beyond the scope of work of the evaluation team. But the result would be the freeing up of perhaps $700,000.

The project must continue to develop the Departmental and Regional Seed Committees; and on an *ad hoc* basis, with the other institutional arrangements described above.

The evaluation team has heard some complaints concerning the quality of seeds certified by the DSCs. Since the credibility of the Committees is at stake, these should be investigated and corrective steps taken by responsible DSCs.

D. ORGANIZATION NACIONAL DE AGRICULTORES (ONA)

1. Agribusiness Enterprises

In November 1989, ONA transmitted a communication to member organizations stating that the Organization would assist in developing marketing and processing projects of interest to groups of members. Two of these (corn and rice marketing) have been carried to the feasibility study stage and the promoters are seeking financing. Two (asparagus freezing, seed potato

distribution) also been carried to the feasibility study stage. The seed potato project has received financing and the asparagus project seems to have good prospects for financing. Total disbursement by ONA for these feasibility studies has been $21,000 (of which $6,000 from ATT project funds). In each case, ONA has received equity capital in the enterprise equivalent to the amount disbursed on studies and expects to receive 50-75% return on its investment within two years of commencement of operations.

This activity seems to be effective, although one of the feasibility studies (asparagus freezing) has been criticized with regard to its market study, supply projections, design of the plant and financial analysis. administrative For each project ONA must apply to the MIAC-NCSU team for approval. That team recently rejected a proposal for study of the export of tropical fruits (in the amount of $4000) and ONA must go it alone on this one.

2. Farm Management

The farm management service (initiated in 1989) is a sub-component of a larger package which includes studies of production costs (since 1985) and further refinements involving cropping patterns, crop sequences, up-to-date messages concerning agricultural technology, and an efficient delivery system for transmitting this information to producers who can make use of it. ONA's analysis of production costs originated in response to the Organization's need for statistical back-up to its lobbying efforts concerning price controls for certain products and crop credit operations of the Banco Agrario. With funding from ATT, the Organization decided to expand the ongoing work on production costs, so as to provide additional services to producers who consent to participate in the program.

Nine zones of the country are covered, each by a field representative. Sufficient data are gathered -- on a sufficiently varied number of producers in the areas served -- on plantings, input use and costs, varieties and receipts, that the subscribing producer can compare his results with those in the same zone. The next step of the analysis is to supplement the above with parallel information from a nearby experiment station, such that the subscriber can make a comparison of his results not only with neighbors producing the same crop but also with other crops in the same zone.

The scheme is well conceived and has already been accepted by 260 producers who will subsequently be asked to pay $50/year for the service. Subscribers will also receive a well-edited bulletin on releases of new cultivars, prices of inputs and commodities and other useful information. Turn-around time for analyzed data (less than one month) is remarkable. If accepted on these terms by 1,000 subscribers, ONA states that the service will reach a break-even point. The evaluation team sees this service as a highly

useful means of technology transfer and congratulates its designers. It remains to be seen whether the collaborating farmers will actually pay for this service; but this activity might become self-sustaining following EOP, provided ONA aggressively markets it, either directly or through TTEs. There is no evidence that the latter has been attempted. Whether the program can become self-sustaining depends to a major extent upon the quality of its field representatives. They are technical high school graduates with varying degrees of experience and motivation but seem to be obtaining effective supervision from ONA's Technical Department.

3. Economic Research and Statistics

Unlike the above, these activities must continue to be subsidized. However, it should be added that some of them feed into the farm management project. Also, ONA has in mind publishing a popular farm economics magazine which would draw on both of the above activities and could be marketed to members and the general public. This could also earn some money for ONA. In this venture, ONA would have competitors; but ONA has the advantage of the trade name, as well as more comprehensive data and analysis than can be obtained from any other Peruvian source.

4. The Marketing Project

In the past, ONA and some of its members have imported fertilizers and some agricultural implements and hand tools for distribution to its members, sporadically and in small quantities, and leading to little or no financial gains to the members or to the national Organization. In 1989, ONA'S Board of Directors authorized a study of the feasibility of creating an enterprise which would provide goods (agricultural inputs) and services (e.g., insurance) to its members. The enterprise might also take on some marketing functions. These possibilities are certainly worthy of study; three consultants are already on board to work out an appropriate institutional structure and its most feasible scope of activities. There might be some technology transfer potential in this project as regards, for example, promotion and demonstration of use of inputs. ONA is asking for support from MIAC-NCSU to fund the study. Provided that the proposed marketing enterprise can be effectively severed from pressures from the various interest groups represented within the Organization, it might be a financial success, although possibly outside the scope of the ATT project.

5. Conclusions

ONA has been allocated project funds in support of its technical staff for all of these activities, including exceptional grants (feasibility studies for member organizations, marketing project) funded on a case-by-case basis by MIAC-NCSU. ONA may be able to turn a profit on this money.

The evaluation team considers this funding mechanism to be satisfactory. The output is generally of high quality, and many of the activities show promise of becoming self-sustaining.

6. Recommendations

ATT must pick and choose among the ONA projects which it will support; and ONA agrees with this judgement, since there are cross-currents within the Organization concerning the degree to which it should adhere to the lobbying function for which it was created, in contrast to support for directly productive projects. The degree of technology transfer included in each of the latter certainly could vary.

Some of the business plans developed under contract with ONA and examined by the evaluation team or other analysts ignore some technical considerations with regard to preparation of feasibility studies, as well as proper business procedures. Since this affects their acceptability to financial institutions, we recommend that a specialist be contracted to train its analysts in the development of feasibility studies and business plans.

CHAPTER IV

Education and Human Resources Development

IV. Education and Human Resources Development

A. Background

The purpose of the human resources component of ATT--to improve the quality of agricultural training, especially graduate training at the National Agrarian University at La Molina--follows directly from the project purpose: to increase agricultural productivity and rural incomes by improving the quality and relevance of agricultural technology and transfer. Both purposes follow in turn from the agricultural sector goal: to contribute to increased agricultural incomes, rural employment, and on-farm capital formation.

A decline in the quality of Peruvian agricultural training and research has been part of a more general decline in agricultural productivity in Peru over the past twenty years. The loss of qualified faculty at UNA to more-rewarding opportunities elsewhere, and the increasing isolation of Peruvian agricultural professionals from the international scientific community have been salient and disconcerting aspects of this decline. Peru's deep economic plunge of the 1980s, and its current hyperinflation, have hastened this institutional demise. It is in the context of this decline that ATT was born, and in an ever deteriorating society and economy that the project is now operating.

When ATT began, and for a time thereafter, there was little knowledge of what it was about in the university community. There was the feeling (which persists to a degree) that UNA was in the project design only to get it approved, and that there was no real interest in involving the university. With the change in UNA administration and the rapidly deteriorating economy, UNA opted to join ATT, hoping to reap some benefit. Many in the UNA community still know little about the project, and there is a common feeling that the university is marginal to ATT, which "belongs" to FUNDEAGRO and INIAA. When UNA finally entered the project in late 1989, many at the university realized to their dismay that funds were not sufficient for implementation, but were adequate only for thinking, for designing, and for planning.

The objectives of ATT are several: to strengthen UNA administration and teaching programs, to strengthen the capacity of both ONA and INIAA to engage in technology transfer, and to provide on a competitive basis academic (graduate degree) fellowships and opportunities for non-academic training to agricultural sector personnel.

B. Analysis

1. UNA

a. The Project Design

At least two major factors must be considered in any assessment of the role of UNA in ATT. First, UNA did not enter the project until October of 1989--two years after the project agreement was signed. And second, the deteriorating Peruvian economy (and polity) has profoundly reduced the implementation capacity of UNA; low salaries and a corresponding low morale are only one manifestation of this problem. Economic insecurity and a fluid and uncertain political environment color and condition everything today--and will probably continue to do so for the remainder of the project. The objectives anticipated in the project design, therefore, will likely be achieved in less degree, and progress toward them will be slower. But the objectives themselves remain substantially valid.

The project design much underestimated the task of curriculum reform in both magnitude and scope. The needs are such that more is involved than a few changes in course content, or texts, or even in the number and kind of courses. The changes needed to make the curriculum respond to Peruvian realities involve adjustments in the relations among the social components--schools, faculties, and departments--of the academic structure. And this structure is a tangle of special interests and jealously guarded turf. The process will thus be slow and involve consensus building; no changes will endure without this consensus.

b. The Institution and its Administration

Meeting in ordinary session only once per semester, the University Assembly is the maximum UNA governing body and sets fundamental policies (see Appendix F). Next in the hierarchy of authority is the University Council, which meets at least biweekly and which governs the university on a daily basis. Both bodies are composed of roughly the same persons: the rector (who presides over both), the two vice-rectors (administrative and academic), the deans of the various Faculties, the director of the Graduate School, professors appointed by the several Faculties, student representatives, and union delegates (with voice but no vote) representing professors and staff.

On the academic side of the university structure are eight Faculties: Science, Agronomy, Animal Science, Economics and Planning, Food Technology, Agricultural Engineering, Forestry, and Fisheries. Each has a governing council and a presiding dean. The Faculties are divided in turn into Academic Departments, each with a chairman. There are twenty-four departments, with degrees

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awarded in twelve Academic Programs at the undergraduate level. Each Faculty organizes its research and extension activities around Research and Extension Programs. These programs perform a community-service function, and in theory are oriented to addressing the development needs of marginal sectors of Peruvian society.

The Graduate School is governed by a Directorate presided over by a director and on which sit coordinators (accredited by the Faculties) of some of the different graduate specialties, or areas in which master's degrees are awarded. Faculties not offering graduate specialties also have accredited representatives on the Directorate, as does the graduate-student body.

UNA differs from American universities in two important ways. First, students have a larger measure of formal power. They comprise one-third of the membership of the Assembly, the Council, and the Graduate Directorate. And second, there are no formal extra-parietal bodies that govern, or otherwise influence, university affairs. There is no Board of Trustees, that is, and no Alumni Association. There are no linkages to the larger society; UNA is truly "autonomous."

The above organic structure is firmly established by Peruvian law. The basic structure thus defines an historically important institution in Peruvian society, and so is not amenable to casual change. But changes in the way in which the structural pieces--Assemblies, Councils, Directorates, Faculties, the Rectorate--operate and relate to each other can be made if there is consensus that such changes are clearly for the good of the university.

In addition to its organic structure, UNA has several Production and Service Centers which depend on the administrative vice-rectorate. These centers are primarily income-generating operations, with opportunities for training and research of secondary importance. In addition, there are three Regional Development Institutes, one in each of the country's major ecological zones--coast, sierra, and selva. These institutes depend on the academic vice-rectorate, and (in theory) are primarily for research and training as these relate to development of the regions. Income-generation is of secondary importance. Today, however, they also function as production centers and provide income to the university. By one informed estimate, twenty to thirty percent of the effort at these institutes goes to research, with the balance going to income-generating production. The Faculty Research and Extension Programs (again, in theory) link importantly with these institutes.

A need to manage efficiently the Production and Service Centers as well as the Regional Development Institutes led to the creation in 1982 of the Agricultural Development Foundation (FDA). Governed

by a five-member board of university personnel named by the rector, FDA administers grants and other non-public funds, thereby enabling UNA to circumvent the heavy state bureaucracy and receive and disburse monies with greater agility and timeliness.

Within ATT, UNA is obliged to collaborate with other institutions in the execution of project activities. Chief among these are FUNDEAGRO and INIAA; there has been some collaboration with ONA, mainly as regards UNA's Farm Management Program, where ONA has provided cost and other production data. By ATT design, UNA collaborates more closely with FUNDEAGRO than with other project institutions. (By some accounts, it was this intended collaboration that deterred UNA leadership from joining ATT during the project's first two years.)

At UNA, one hears that FUNDEAGRO is inflexible with regard to its policies and procedures, that it is not prompt in disbursement of funds, that it does not respond in a timely manner to communications initiated by UNA, that it has become an executing entity rather than a service one, and that it is trying to execute too many project functions --functions that often belong to UNA. As one critic put it, FUNDEAGRO is growing too much and has too much power; it has become a small ministry and will soon be doing agricultural research.

With regard to research grants, it is said that FUNDEAGRO communicates only with the professor receiving the grant; his department head and dean are often not informed. Furthermore, FUNDEAGRO requires no commitment by the grant recipient to his university. This private arrangement, it is argued, is detrimental to the university as institution.

UNA's relationship with INIAA is for the most part informal. Since UNA has for many years been the chief (and for a long time, the only) agricultural training facility in Peru, many employees of INIAA have been trained there. These employees maintain informal ties with UNA faculty, and personnel from the two institutions engage in some collaborative research. Several INIAA personnel are now pursuing M.S. degrees at UNA with ATT fellowships.

Project activities to strengthen UNA's administration are recent and the results understandably modest (see Appendix G). Advisory committees have been established for both administrative review and research; the rector visited the United States in April and May of this year; and the academic vice-rector is to visit in July. An overall evaluation of university management by an outside firm is planned, and draft regulations have been prepared for the establishment of an alumni association. Also, a fax machine has been installed, specifications have been prepared for a new telephone system, and an introductory word-processing course will be offered for UNA secretaries in July.

A number of steps have been taken to strengthen FDA. Major reviews of FDA's accounting procedures and computerized accounts have been conducted by management consulting firms. And substantial headway has been made to prepare the documentation required by AID/Washington for certification of FDA as an eligible PVO.

It is not easy to plan programs to strengthen the UNA administration in an uncertain and unstable political and economic milieu. The recent national elections may portend substantial changes for UNA, as may also an economy that worsens by the day. It can be argued that planning makes little sense until there is enough stability to get a fix on the future, and therefore to know what kind of plan to prepare. But this awaited stability may be long in coming, so some sort of plan must be prepared meanwhile--one that can accommodate prolonged instability.

The state has been unable to provide sufficient operating (and counterpart) funds to UNA, thus forcing it to draw from funds it generates through its Institutes and Production Centers. Indeed, these operations have assumed an expanded importance in these hard times, and UNA administrators and professors look to rationalizing production there. They talk seriously of making UNA independent of the state--of converting UNA into a business, whereby the institution would finance itself through the sale of technical services and products. But this would involve some profound changes. Professors would have to acquire a "business mentality" (not easy for many academics), and a preoccupation with production would force a rethinking of the roles of research, teaching, and community service in the university. Indeed, such a move away from the state involves nothing less than a rethinking of the role of UNA in Peruvian society.

A local executive director was hired in 1988 to manage ATT activities at UNA. But when UNA later balked at the idea of an outsider in this role, the director was dismissed. Instead, it was decided to establish a collegiate management entity (with an UNA manager) composed of six committees (administration, curriculum, research, extension, incentives, agricultural policy--each with a chairman) corresponding to ATT activity areas. UNA also balked at the idea of having long-term advisors for the activity areas, as the project envisaged. There is no useful role for them, it was argued, and the money budgeted for them should be used to provide incentives for those UNA personnel working on the committees. The idea of committee management is to involve as many professors as possible, thereby promoting their identification with the project as well as a consensus required to implement project activities. This arrangement, it is argued, increases the chances that ATT activities and results will be sustained.

At present, about half of UNA's professors are involved in these committee activities. The committee system is a viable approach to ATT implementation at UNA and may be the only way to achieve

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curriculum reform, since each Faculty jealously guards its curriculum and must ultimately decide on the form it takes.

c. Faculty Incentives and Enrichment

With a deteriorating economy and an inflation rate in excess of thirty percent per month and rising, morale among many UNA professors is very low. Real salaries are already at an all-time low and falling, and experienced professors are leaving the university. Indeed, the low salaries place all ATT activities at UNA in jeopardy. But the bad economy is only the final blow in a process that began years ago. The prestige of agricultural research, and those engaged in it, has declined over the years. This decline is reflected within UNA, where once-colorful and important rites of passage, such as the promotion of professors, are no longer celebrated with ceremony. The trappings of recognition are now few. In sum, there is no longer the mistica to motivate professors, researchers, and students. And yet it is this mistica that is today needed more than ever, to weather the hard times.

This crisis of the spirit has implications for ATT. It means, for example, that little things--or big things taken for granted in better times--can assume great importance. Dependable light and water, for instance, are not only indispensable to modern teaching and research, but can boost morale among professors (and students--UNA has included students in ATT incentive activities), who today have these basic services only sporadically at home.

Faculty enrichment activities are also important incentives. The provision of improved opportunities for training and research abroad are major performance incentives. And likewise the availability of teaching aids such as overhead projectors, and larger research grants for graduate students, so their professors could go into the field with them to supervise.

Personnel for UNA's incentive committee have been named, but the committee has not yet been active. There has been some informal discussion of needs among those involved, however. These needs include distinctions for time in service for professors and administrators, awards for the best theses (to be shared by a student and his professor), awards for best faculty research, awards for the best student, and awards for outstanding community service.

Little has been done to date to enhance the awareness of UNA faculty of the problems of Peruvian agriculture (see Appendix G). But work toward the establishment of linkages between UNA and the larger society (and work on curriculum reform) has begun, and these linkages should do much to address this problem.

d. Curriculum Reform

According to informed sources, UNA first began to experience strains in its curriculum in the late 1960s, as agricultural science moved toward greater specialization. Since that time, curriculum changes have been made at the whims of a series of rectors and governments, and without regard for internal curriculum coherence or for the demands of a changing science or a changing Peru. The current curriculum is the result.

Some UNA Faculties today are more concerned with administrative norms than with academic ones. There is no university policy regarding curriculum, no effort to link it to particular skills needed by the several agricultural professions in the Peruvian setting. The task is not merely one of modernizing a curriculum: the question must be put, What sort of agricultural scientist does Peru need?

A curriculum-reform committee has been established, and several subcommittees and commissions have been created to deal with pertinent aspects of the task (see Appendix G). Two workshops have been held and reports on them prepared, and a short-term national advisor--and curriculum expert--has been hired to guide the process. Evidence suggests that this advisor has done an excellent job, and plans are to contract with him at strategic points in the process until the work is complete. Curriculum reform is one area where outside guidance is definitely needed. It should be pointed out that UNA is also looking at the undergraduate curriculum, for change at the graduate level cannot be made in isolation; there must be continuity and consistency between the levels.

The process of reflection, discussion, and debate now underway is gradually defining issues that must be addressed in curriculum reform. To mention a few of them is instructive.

There is a major debate on the desirable degree of specialization of the several degree programs at the M.S. level. As one key participant in the debate put it, Do we want an agronomist who knows a little about everything, or one who knows a lot about a few things? Perhaps a solution here is to offer two kinds of M.S. degrees, one a general degree and the other a specialized one. Along this same line, a non-thesis M.S. could be offered whereby a student takes additional courses in lieu of a thesis. The non-thesis degree would provide practical training for non-research jobs in the agricultural sector.

Curriculum reformers are looking critically at the role of the basic sciences (there is even a struggle to define them) in the UNA curriculum. And there is debate between professors who teach those courses and professors who teach courses in general culture

(sociology, languages, economics) over the relative emphasis to give each.

There is substantial sentiment that the curriculum is too rigid, that more concern is shown for compliance with regulations (regarding number of credits, or the completion of certain courses) than for the validity of the regulations themselves. Students often do not know why they are taking certain courses, and professors cannot provide satisfactory explanations. The curriculum divides broadly into general courses, taken during the first three semesters, and specialty courses taken later in the Faculties. But rigidities are such that students accumulate in these first three semesters rather than pass into the specialty courses. About forty percent of all students are now in these first three semesters. Some of the specialty courses are accordingly quite small, having from two to ten students in them.

Student learning is confined largely to the classroom and labs, where instruction is theoretical. Students rely almost entirely on lecture notes; they make little use of bibliographic materials (themselves deficient), and they do not face real situations. There is too little student participation in UNA's production centers or regional development institutes.

Some curriculum reformers argue that the Faculties of Agronomy and Animal Science must be given special attention since they deal with production--and increased production is what Peru vitally needs today. Newer Faculties, such as Agricultural Engineering and Food Technology, are less in need of reform.

The issue of the appropriate mix of degree programs at UNA will be decided by the review process described above. It and other issues regarding curriculum reform must be decided by Peruvians, in their own way, if consensus is to be achieved and reforms are to be lasting. One hopes that these decisions will be taken in accordance with an enlightened understanding of the current needs of Peru. The process now underway affords a reasonable prospect that this will happen.

2. Training

a. Priorities and Selection Procedures

An Academic Selection Committee composed of representatives from several agrarian sector institutions was established within FUNDEAGRO in 1988 to select candidates for academic fellowships. A committee composed of representatives from FUNDEAGRO, MIAC, and NCSU selects non-degree fellows. A USAID representative sits on

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both committees, and indications are that both function well, and as intended.

In the selection of candidates for M.S. fellowships in Peru, priority is given to applicants from four broad fields: agricultural extension, agricultural economics, genetics, and irrigation engineering (with soils). Experts at UNA identified these fields as those with the most urgent training needs in Peru. For overseas degree training, candidates are accepted from a wide variety of fields within the physical, biological, and socioeconomic sciences. Fellowships are open to candidates from all areas of the country, though some slight preference (according to FUNDEAGRO) might be given to candidates from one of the five geographic areas promoted by the project if competing applicants are equal in other ways.

Selection procedures thus broadly favor relevance of the training to the needs of Peru (and to ATT), at least with regard to fields--as well as favor relevance to the needs of the candidate's sponsoring institution. (It should be noted that none of the overseas degree fellows is studying extension or agricultural communications.) INIAA, for example, selects (in theory) those candidates for M.S. training according to its needs. With regard to the relevance of training content (at least for training conducted in Peru), a project-recognized need for curriculum reform at UNA would suggest deficiencies.

With respect to overseas academic training, would-be applicants often do not know what overseas schools (and where) offer what programs--not to mention the entrance and degree requirements of the schools. This is a greater obstacle in the provinces than in Lima. Also, for overseas degree studies in the English-speaking world, there is no provision for language instruction, thereby eliminating otherwise qualified potential candidates. This problem also is probably greater in the provinces, where opportunities to learn English are fewer. Both of these impediments have the unintended consequence of biasing the applicant population.

Of the forty-six M.S. fellowships awarded by ATT in 1989 (there were none in 1988) for studies in Peru, six went to women; none of the six fellowships for M.S. studies abroad did (see Appendix H). Neither were there women among the five fellows sent abroad for Ph.D. studies in 1989. In the first trimester of 1990, three of the seventeen candidates selected for M.S. studies at UNA were women. But nine of the twelve candidates selected for M.S. studies abroad for this period were women. Twenty-three percent (=19) of all (academic and non-academic) scholarships (=85) to study abroad since the inception of ATT have gone to women. This is higher than the percentage of women employed in technical areas in the agricultural sector. (The percentage of women among rejected applicants for all degree training is about the same--fifteen percent--as their percentage among selected candidates.)

b. Degree Training

Here, several changes have been made in the project design. First, the LOP goal of 200 M.S. fellowships for study at UNA was reduced to 120 to allow an extra $3,000 per fellow to upgrade the UNA library and labs, to strengthen classroom and teaching support, and to provide funds for thesis research. Second, the number of off-shore M.S. and Ph.D. fellowships was reduced when adjustments were made to compensate for a cut in the overall project budget from about $54,000,000 to $25,000,000. The training budget was reduced from about $2,000,000 to $1,550,000. And third, the project did not envision sending fellows to regional universities for M.S. degrees, but rather was to take professors from there (and elsewhere) to UNA for degrees. ATT currently seeks to strengthen selected regional universities (e.g., Puno, Piura, Arequipa, U. de la Selva) both by sending M.S. students to them (those that have M.S. programs) and by training their professors through fellowships.

ATT plans major support to the National University of Piura (UNP) to begin an M.S. graduate program (UNP's first) in rural development. This support will take the form of fellowships for twenty of the new program's first class of thirty students. Because of the number of scholarships, this support will be a major institutional strengthening effort as well as a training one.

UNP's proposed program has much to recommend it. The interdisciplinary degree will involve close coordination among four Faculties (not an easy thing to achieve), and students will receive practical training in rural development from the Centro de Investigacion y Promocion del Campesino (CIPA). A formal agreement is soon to be signed between the two institutions. CIPA is a Jesuit operation that works mainly to improve small-farmer subsistence crops and livestock. CIPA has much to offer: research facilities and a good technical staff, good relations with rural communities (mostly on the coast), and considerable practical expertise in rural development.

By far most of the graduate degree training under ATT within Peru is conducted at UNA, with a few fellowships to study at regional universities. Of the fifty-six M.S. fellowships awarded by ATT to date for study in Peru, seventeen have been to professors from regional universities (see Appendix H). (Eleven of the 31 graduate fellowships for study overseas have gone to persons from universities other than UNA--see Appendix H). These awards will only marginally strengthen the regional universities, however, because of their small numbers for a given university (and because of severe limitations on university training and research imposed by the economic and political crisis).

ATT graduate training probably has a greater effect on INIAA (with eight overseas fellowships for INIAA personnel and thirty-one of fifty-six domestic M.S. fellowships for them--see Appendix H) because of the greater number of fellows from that institution. Because this training is in fields corresponding to the most urgent needs of Peru, the chances are reasonable that it will have a positive impact, albeit a modest one relative to the enormous political and economic problems facing Peru today.

According to UNA, several undergraduate professors (by one estimate, about seventy) there have begun work toward an M.S. (at UNA) but have not been able to complete the degree for lack of resources. UNA would like to use ATT funds to enable those professors to complete their degrees so they could then teach at the graduate level. Supporting these undergraduate professors would be a quick way--it would take about a year--to upgrade the UNA teaching staff.

With regard to the fellowships, two apparent problems need attention. First, there were complaints that the M.S. fellowship's living stipend for Lima was inadequate. And second, there were complaints from UNA that funds were not available to support thesis research for M.S. fellows, thereby retarding degree completion. According to FUNDEAGRO, the per-student contribution to UNA is intended to cover thesis expenses.

c. Non-Degree Training

When the participant training budget was reduced (from $2,000,000 to $1,550,000), post-doctoral and sabbatic study leave opportunities (per the project design) were eliminated. There are now basically two types of non-degree fellowships: observational training (less than one month--includes site visits, meetings, seminars) and "impact training" (usually a semester). Sixty-two non-degree fellowships have been awarded, eight of them to women (see Appendix I). All of this training has been conducted overseas; ATT cannot send personnel to non-degree training events in Peru--a matter widely regarded as a project weakness. (It should be noted that many UNA faculty today must engage in extra-parietal employment because of the poor economy, and so are unable to participate in overseas training events.)

The specialty areas (see Appendix I) for non-degree training appear to square with project goals. It is not possible to comment on the qualifications of non-degree trainees as regards those goals since the information is unavailable (and the trainees are numerous). Fifty-eight percent of the non-degree trainees responded to a questionnaire sent by ATT to evaluate the training experience. The responses, tabulated in Appendix I, suggest that the training was professionally relevant.

UNA favors impact training abroad (a semester or more of intensive work with a foreign colleague) as an efficient way to end the long isolation of its professors and acquaint them with recent changes in their fields.

3. Training at ONA

ATT training at ONA has been modest and has focused on three populations: farmers, gremio leaders (usually farmers), and ONA personnel. Consulting experts were sometimes contracted to prepare and deliver the training.

Several farmer-training events were conducted in 1989 dealing with production topics such as fertilization and pest management. These events, in which 690 farmers participated, include ten field days, nine of them concerned with cotton production and one with fruits. In addition, a course on asparagus production was held in Viru for sixty producers. In the first trimester of 1990, there were six roundtable discussions on the production of cotton, corn, potatoes, rice, asparagus, and fruits. A seminar on seed commercialization was held in March, and a second course on asparagus production was held in Viru in May.

There were two courses in 1989, mainly for agrarian sector leaders. The first (at the national level) was held in Trujillo (June 30 to July 2). Attending were the presidents of national producer committees, the presidents and coordinators of ODAs, the presidents of several institutions affiliated with ONA, and management-level officials of ONA. The second course, held in Piura (December 18-20), was for gremio leaders from that department. Both of these courses, facilitated by training consultants using participant training techniques, were designed to strengthen leadership. They focused on decision-taking, planning, analysis of obstacles, organization, and creative thinking.

In August of 1989, a seminar on "Human Relations and Communication" was held in Lima for ONA professional personnel. And a course on agricultural management (gestion agraria) was also held in Lima (September 18-20) for eight ONA technicians from ONA's pilot zones, for several technicians from national producer committees, and for seven professionals from FUNDEAGRO.

These latter two courses trained transfer agents in communication techniques. ATT training of this kind for ONA personnel has been extremely limited--and thus probably of little lasting consequence. ONA's farmer-training events focus on a special technical problem and seek directly to help farmers with that problem. If one draws a fine line between technical assistance and training, these "courses" are probably more technical assistance than training. They originate through requests from an ONA field technician in

consultation with farmers (or their leaders) growing a certain crop. They thus respond to a farmer-felt need. The other courses seek to strengthen farmer organizations and are not--at least not directly--concerned with technology transfer.

4. Training at INIAA

ATT has provided training to technology transfer specialists employed by INIAA. According to the project design, these persons would link INIAA research results to MAG extension agents and others working directly with farmers. In project parlance, these specialists are technology "wholesalers." Fifty-five of them were to be created during the LOP.

There are today fifty-two of these specialists. Eighteen of them work with seeds and are called seed coordinators; the other thirty-four are employed by INIAA's DGPIST office and have received training by CTTA. This training has focused on specialists at twelve experiment stations, where trainees have included DISP directors as well as directors of technical diffusion.

The full CTTA training cycle for technology transfer involves two workshops, the first lasting six days, the second ten days. These workshops, which blend theory and practice, lead trainees through a defined sequence of steps, each with its methods, in a technology transfer process. The process begins with a diagnosis of farmer needs and communication channels in a given geographic area, and then moves to a design stage in which strategies of intervention are developed. Station researchers participate in this design stage, which involves an analysis of the data collected in the diagnostic stage with a view to selecting an appropriate technology to meet farmer needs. In the next stage, a plan is prepared to disseminate the selected technology--a plan establishing the appropriate communication modes (radio programs, flyers, field days, and so on). The execution of the plan is the final stage.

INIAA specialists at one of the stations who had received the CTTA training spoke highly of it. They felt that a further workshop would be useful in which they could present their implementation problems and receive directions on how to deal with them. However, they noted that the transfer process is now facing some formidable obstacles: few resources for vehicle maintenance or gasoline, and consequently little work in the field. Also, station researchers are sometimes reluctant to offer the simpler technologies that the CTTA field diagnosis suggests as appropriate.

Seven CTTA training events for transfer specialists have been held in different zones (Puno, Chiclayo, Arequipa, Trujillo, Tacna, Piura, and Huaral) of the country during 1989 and 1990, with a total of 100 participants, many of whom attended the two-workshop cycle.

C. Conclusions and Recommendations

The isolation of UNA over the past several years from Peruvian realities as well as from the international scientific community is remarkable and regrettable. This isolation has had profoundly debilitating consequences for the institution and for the country. It is imperative that the isolation end if UNA is to play a constructive role in Peruvian society. Most of the following recommendations, therefore, seek to reverse this historical slide into isolation and irrelevance. (Recommendations preceded by two asterisks should receive priority in case of reductions or delays in funds to implement them.)

1. General Recommendations

** ATT should provided UNA immediately with generators and a water pump. Power and water are basic to the teaching and research functions of a modern university. For power, two 1-meagawatt generators would probably be better than a single large generator.

* ATT should not be engaged in the institutional strengthening of regional universities. Project resources are few, and there is a prior commitment to UNA. To send an occasional student to a regional university in the interests of the best training is acceptable, but financing M.S. students en masse to strengthen institutions is not. But should ATT (or a successor project) enjoy the resources and have the appropriate mandate at a future time, support for an M.S. program in rural development at the National University of Piura should be seriously considered for reasons already given above.

Because of its limited resources, Peru cannot support many agricultural schools. Yet there is a compelling need for these schools in the regions--a need to decentralize agricultural training. Therefore, some sort of training division of labor is sorely needed. The problem, which is enormously complex (and much transcends ATT), is one that the GOP should attend to soon.

2. Administration

* ATT should contract with a local management firm for an overall evaluation of UNA management, both administrative and academic. The evaluation should examine planning, accounting, and business systems; academic and non-academic personnel policies;

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intra-university communications; and delegations of authority and responsibility.

* UNA should institute a training and orientation system for deans and other administrators. The system should include an annual leadership conference in which administrators discuss strategic planning, project implementation, and the stimulation, encouragement, and evaluation of the teaching staff. Such a system is necessary because most university administrators, in Peru as elsewhere, are academics with little training in administration; and they do not hold administrative jobs long enough to acquire the necessary skills.

* To become less isolated and better respond to Peruvian social, economic, and political realities, UNA should establish linkages to external constituencies such as farmers, businessmen, politicians--to the people of Peru. These linkages might include: an alumni association; advisory councils (at the level of the rectorate, to help the rector know how to deal with major political, economic, and social changes in the country) composed of national leaders in agriculture, business, education, and politics; and visiting committees (at the level of the deans, to suggest curricular changes, identify research problems, and supply funds) made up of employers of UNA graduates and users of UNA's technologies.

* To strengthen FDA, ATT should provide funds to enable its executive director and members of its board of directors to visit several university foundations in the U.S., and also foundations in Latin America. These visits would give FDA personnel a good picture of management, of fund-raising, of relations with the public and the university.

3. Curriculum Reform

** ATT should make more resources available to achieve curriculum reform. This task is enormous, and goes beyond what was envisioned in the project design; it must include, for example, the undergraduate curriculum as well. The national curriculum advisor has been very effective and should continue to guide the process of reform, intervening sporadically at strategic points. It is estimated that viable reform cannot be achieved in less than two years from January of 1990. In this reform process, UNA reformers should at every turn take as their point of departure the needs and realities of Peru--e.g., what kind of agricultural specialist does Peru need?--rather than what exists in the United States or elsewhere.

* As an integral part of curriculum reform, UNA should take a serious look at student admission policies (e.g., how many students

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to admit to each program) and at required student qualifications.

* In its training programs, UNA should involve the social sciences more; these should operate with the so-called production sciences (agronomy, animal science) in a multidisciplinary approach to problem diagnosis and solution. Such an approach is necessary to address the complex needs and problems of Peru.

* UNA must develop more flexibility in its curriculum so that multidisciplinary degree programs can be offered. This will involve a surrendering of some independence by individual Faculties, for such programs necessarily cut across Faculty boundaries and require agreement on issues such as who certifies for graduation, or who sets degree requirements. Mechanisms for inter-Faculty cooperation in this regard are much needed.

* The use of committees to achieve curriculum reform must be continued; they are a viable way to achieve consensus in the university setting. And without such a consensus, there will be no lasting curriculum reform. Furthermore, ATT should provide incentive payments to UNA personnel working on these committees. However, in no case should a person receive compensation for work on more than two committees (although he can work on any number of committees).

4. Training

* ATT must review the cost-of-living stipend for M.S. fellows at UNA.

* FUNDEAGRO and UNA hold conflicting opinions regarding the availability of monies for support of graduate theses. It is imperative that the two institutions resolve this problem immediately.

* ATT should provide for the support of non-degree in-country training. For example, there should be fellowships for second specializations at either the B.S. or M.S. levels. And ATT should have the flexibility both to offer short courses in Peru and to send Peruvians to short courses in Peru.

* ATT should provide for the support of UNA undergraduate professors who have already worked toward the M.S. (at UNA), but who have not fulfilled all degree requirements. This would be a quick, efficient way to upgrade professors as well as increase their number at the graduate level.

** ATT Should increase "contact training" (the sending of Peruvian faculty abroad for a semester or less, to work with a professor in

their area of expertise) for university faculty. This would be a quick way to address the intellectual isolation of Peruvian professors.

CHAPTER V

Institutional Analysis

V. INSTITUTIONAL ANALYSIS

A. BACKGROUND

ATT seeks to promote technology generation and transfer to Peruvian farmers through a combination of four public and private institutions. The public institutions are represented by the Instituto Nacional de Investigación Agropecuaria y Agroindustrial (INIAA), and the Universidad Nacional Agraria "La Molina" (UNA). The private sector institutions are the Organización Nacional Agraria (ONA) and the Fundación para el Desarrollo del Agro (FUNDEAGRO). ATT attempts to strengthen and expand the programs of each individual institution, and to promote coordinated action in areas in which ATT objectives are common to all four institutions.

Three inter-related sets of issues lie at the heart of the institutional analysis. One of these is the extent to which the activities undertaken by the various institutions are consistent with achieving the overall agricultural development that ATT seeks to promote. The second set of issues involves the degree to which ATT is providing the individual institutions participating in the project with the support they need to grow and develop in the directions envisioned in the PP, and, conversely, the extent to which their development is resulting in the fulfillment of ATT objectives. Finally, the institutional analysis considers the aggregate impact of the support to the four implementing institutions with respect to promoting inter-institutional and professional coordination.

The institutions implementing ATT offer a reasonable way of achieving the objectives of the project. The establishment of a foundation like FUNDEAGRO to act as a supporter of what the PP calls a science-based approach to agricultural development offers the possibility of securing more stable funding for research, technology transfer, and other priority activities than the Government of Peru (GOP) has been able to provide, and for creating an alternative to dependency on external donor support to provide continuity in funding critical areas. The combination of organizations provides a basis for improved communication and coordination between public and private institutions concerned with agricultural development, as well as incentives for individual competition in areas such as securing financial support for advanced training or the conduct of agricultural research. Also, the involvement of all participating institutions in the evaluation and selection of activities to support in these areas creates a climate favorable for competition based on technical considerations, rather than having study and research opportunities being treated as plums of political patronage.

Despite the unstable economic and political climate and a number of specific problems faced by participating institutions, ATT has managed to move ahead in several areas during its first two and a

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half years. The seed certification system described in the project has advanced significantly, and the competitive grants program is emerging as an important avenue for financing agricultural research. While there have been serious problems associated with financial management and the disbursement of funds resulting in unconscionable delays in the payment of their salaries, the national advisers envisioned in the PP have made important contributions to the realization of specific activities.

The institutional analysis revealed a fundamental problem in the conception and design of ATT to which the majority of implementation problems described in this report may be traced. In brief, the dual role assigned to FUNDEAGRO as 1) a foundation which, as an independent source of funding, acts as a mentor in setting agricultural research and education priorities, and 2) a project implementing agency charged with extensive administrative and financial management responsibilities, has created bureaucratic confusion and institutional ill will that threaten the sustainability of the foundation model that ATT seeks to establish. FUNDEAGRO has become highly bureaucratic, acting in many cases more like a government agency than the agile private sector institution envisioned in the PP. This has created confusion within FUNDEAGRO with respect to its overall mission and the definition of its relationships with the other institutions participating in ATT. Equally importantly, it has placed FUNDEAGRO in a position in the project whereby it is vulnerable to being blamed by USAID/Peru and the other ATT institutions for a substantial portion of the administrative and financial shortcomings of the project. Thus, while all involved agree that there is an important niche to be filled in Peru by an institution like FUNDEAGRO, FUNDEAGRO itself has come to be viewed by many as expendable within the ATT structure. This creates the danger that one of ATT's most important potential contributions, the establishment of a private foundation to provide guidance and funding for agricultural research and education, may be lost.

This overall finding informs the discussion of the institutional issues facing the individual ATT organizations which forms the bulk of the present chapter. The issues discussed here respond to specific questions raised in the Scope-of-Work for the institutional analysis. However, the responses to the individual questions are shaped by this assessment of the failure of ATT to establish an institutional context conducive to the development of the self-sufficient agricultural foundation described in the PP.

B. ASSESSMENTS OF INDIVIDUAL INSTITUTIONS

1. FUNDEAGRO

a. Adequacy and validity of original purposes

The purpose of establishing and supporting the institutional development of a foundation under ATT is to create an organization that, by acting as an independent procurer and donor of funds, provides stability in defining and acting upon priority concerns in the agricultural sector, and which acts as a nexus for coordinating the activities of state and private sector organizations. In situations characterized by limited and rapidly shrinking availability of public funds and extreme bureaucratization of public sector institutions in the face of this impoverished resource base, foundations can play a vital role. The foundation model has been successfully implemented in several Latin American nations, and their functions are discussed in detail in Coutu (1990).

However, the role of the foundation has been obscured under ATT in the case of FUNDEAGRO. The problem in recognized by participants in the project, as Bandy's (1989:2-3) observations, below, indicate:

> [The foundation concept]...is a particularly difficult concept to understand and I'm not sure that AID, Lander Pacora nor myself really understands what needs to be done...Currently, there is a tendency for the other implementing institutions of the ATT project to look upon FUNDEAGRO as an impediment, a sort of "monster" created by AID, and not as a "facilitator" or mechanism to alleviate bureaucratic inefficiency and/or administrative bottlenecks.

In addition to providing FUNDEAGRO with support to develop as an agricultural foundation, ATT charged it with substantial project administration duties that make it responsible for the flow and financial control of funds going to each of the other three institutions. Among other responsibilities, FUNDEAGRO is charged with paying the salaries of the ATT manager assigned to each project as well as of the national advisors assisting each institution with the implementation of particular ATT activities, supervising the restructuring of the UNA library, and the establishment of profitable, private-sector technology transfer enterprises (TTE).

As the most recently established organization participating FUNDEAGRO has the least experience in project administration, plus it has a full-time job defining a niche for itself serving the agricultural sector and seeking to diversify its financial support. The project implementation and administration responsibilities are sapping FUNDEAGRO's resources and, as a result of inevitable administrative inefficiencies in its relations with other institu-

tions, undermining its credibility as an efficient provider of resources. The result is that, while there is general agreement that a foundation such as FUNDEAGRO has an important role to play in establishing and supporting priority areas in agricultural development, FUNDEAGRO itself is widely regarded as expendable. Thus, FUNDEAGRO is often blamed for inefficiencies in the project in which it plays no role. On several occasions, for example, INIAA personnel blamed FUNDEAGRO for delays in receiving ATT support for bienes y servicios in experiment stations and complained about FUNDEAGRO's unresponsiveness to their complaints on this point. In fact, these funds pass directly from USAID/Peru to INIAA's central administration and FUNDEAGRO plays no role in approving expenses charged to this budget line or in disbursing funds.

The basic problem is the one cited by Bandy, above; i.e., people with critical responsibilities for FUNDEAGRO's institutional development and its administrative duties as a ATT implementing agency are unclear about how a foundation operates. FUNDEAGRO's professional staff does not include people with experience in private foundation development. Thus, rather than acting as an agile promoter of innovative agricultural research and technological transfer, FUNDEAGRO frequently reproduces the image of an unwieldy agency placing "Mickey Mouse" bureaucratic hurdles in the way of those responsible for achieving ATT objectives. For some this is reminiscent of USAID, while others associate it with the Peruvian public sector institutions of which most of FUNDEAGRO's top professionals are veterans.

ATT urgently needs to sort out FUNDEAGRO's responsibilities as an implementing agency from its efforts to develop as a foundation supporting the Peruvian agricultural sector, and to make this distinction clear in the management structure of the project. A specific proposal for achieving this reorganization is presented in this report's "Main Findings and Conclusions". In addition, FUNDEAGRO's institutional development would benefit greatly from input from other private foundations in Peru which have enjoyed success in attracting funding and acting as a locus of innovative thinking. For example, the Fundación Peruana para la Conservación de la Naturaleza (FPCN) has been quite successful in playing this role for Peru's growing environmental movement. While its success in generating external funding has to date been modest, FDA has played a catalytic role within UNA, and two members of its board of directors are also on the board of directors of FPCN (one is a co-founder of FPCN). Thus, the necessary expertise in the institutional development of a foundation already exists within the ATT structure. Action needs to be taken quickly and decisively, however, because the sustainability of ATT activities depends in large measure on the establishment of a sustainable agricultural sector foundation. At present, FUNDEAGRO's role as an implementing agency is undermining its own institutional development as a foundation.

b. Efforts to diversify funding

ATT currently constitutes over 90 percent of FUNDEAGRO's budget. The remainder is divided among several relatively small activities, some of which were originally to be managed by FUNSIPA, when this institution existed to provide funding support for INIAA. The largest of the non-ATT projects is funded by CIID (Canadian Institute for International Development). The total budget for the four-year project, which began in 1987,with FUNSIPA, is $3.5 million. In the CIID project, FUNDEAGRO's role is strictly administrative, and it charges an overhead for the provision of this service. It does not act as an executing agency; nor does it fulfill any "foundation functions" in the sense of defining priority areas in agricultural development and exercising discretionary power over the direction of funds to those areas. FUNSIPA/FUNDEAGRO has also received a small amount of funding from COTESU (Cooperación Técnica Suiza), and FUNDEAGRO is currently co-managing a project with CIP (Centro Internacional de la Papa) on the management of soils in tropical pasture areas, with funds from CIAT (Centro Internacional de Agricultura Tropical).

FUNDEAGRO's major effort to obtain substantial non-ATT funding has been related to Peruvian Government efforts to buy back some of its public debt. Under the arrangement Peru has designated a series of areas to which it has promised to dedicate resources in return for buying back debt on its behalf on the international debt market. These include agricultural renovation, conservation, and other areas, and, in each case the Peruvian government has designated public and private institutions eligible to receive funding resulting from debt purchases. The evaluation team was told conflicting stories regarding whether or not FUNDEAGRO has been successful in having itself included on this list. In any case, debt buy-backs have not yet generated funds for FUNDEAGRO.

FUNDEAGRO has also sought donations from multinational corporations that presumably would see benefits for themselves in the sorts of changes in the agricultural sector that FUNDEAGRO is promoting. While there is optimism that these efforts will bear fruit in the medium-to-long run, they have not yet generated any funding. FUNDEAGRO has not approached international foundations that support agricultural development (e.g., Ford and Rockefeller), nor has it systematically explored possibilities of securing funds from bilateral donors other than USAID/Peru. Contributors to FUNDEAGRO can receive a deduction of one dollar off their taxes for every dollar they give to the institution. However, in practice, this is not a great incentive to donate, because contributions to Peru's universities generate a two-dollar reduction in taxes for every dollar donated.

c. Linkages with other private-sector organizations

FUNDEAGRO has two types of linkages with private sector agricultural organizations. One of these is its with ONA as a co-

implementing institution under ATT. The other type of linkage is with agricultural organizations that are actual or potential beneficiaries of FUNDEAGRO assistance through the ATT project. These linkages are generally related to the establishment of technology transfer enterprises (TTE) or to the participation of private sector enterprises on departmental seed committees.

At present, most of the TTEs are being established within the framework of existing agricultural cooperatives. These vary considerably in their experience in functioning as private sector businesses, and in providing the kinds of technology-transfer services envisioned by ATT on for-profit or self-supporting basis. There have also been expressions of interest in establishing Thus as private sector corporations (Sociedades Anónimas) by Peruvian business people interested in promoting the sale of agricultural implements or input packages to farmers. However, this remains at the stage of discussing possibilities, and convenios have not yet been finalized. FUNDEAGRO has played an important role in moving some of the cooperatives to venture beyond providing very basic services to their members (e.g. FONAGRO, in Chincha), while in other cases it appears that they would have proceeded with plans to develop activities in the area of technology transfer with or without input from FUNDEAGRO (e.g., CAU La Esperanza, in Huaral). All of the Thus have been formed too recently to permit the quality of FUNDEAGRO's technical assistance and tutelage in the establishment of self-supporting enterprises.

The membership on the Departmental Seed Committees is mixed, and includes representatives from public-sector institutions such as the Ministry of Agriculture, INIAA, the Banco Agrario, and ENCI (Empresa Nacional de Comercialización de Insumos), and private-sector representatives from farmers' water users groups and cooperatives, agroprocessing industries (e.g. Gloria, S.A., in Arequipa), and certified seed producers (e.g. HOPETA and AGRICOLAS, in Ica). In some cases seed committees existed at varying levels of activity prior to efforts by FUNDEAGRO to establish Departmental Seed Committees under ATT, while in other cases FUNDEAGRO was the major instigator in establishing them.

d. Management/administrative roles

(1) Management of ATT

FUNDEAGRO has generally received poor-to-mediocre evaluations from other ATT institutions regarding its management of the project. Most of the complaints involved inefficient processing of funds and/or the erection of unnecessary bureaucratic barriers to the disbursement of funds. A substantial portion of these problems can be traced to the confusion between FUNDEAGRO's ATT management responsibilities and its role as a foundation that hopefully will be a source of guidance and stability in agricultural research and technology transfer. In a number of instances, representatives of

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the other implementing agencies were misinformed regarding FUNDEAGRO's role in the project, and blamed it for problems that, in fact, lie within their own institution or in the administrative procedures of USAID/Peru. In other cases, poor interpersonal relations between the director of FUNDEAGRO and key personnel in other institutions appear to have resulted in checks having been processed efficiently by the FUNDEAGRO staff, only to be delayed at the point of receiving the final signature and being dispatched.

USAID contracted the Peruvian affiliate of Price Waterhouse to conduct an administrative evaluation of FUNDEAGRO in February 1990 (Gaviria 1990). The report indicated a number of shortcomings, of varying degrees of seriousness, in FUNDEAGRO's management of ATT. These include:

1) unfamiliarity with USAID financial accounting and control procedures, resulting in approximately $80,000 of ineligible expenses being submitted to USAID/Peru during the audit period of 18 April 1988 through 31 August 1989;

2) frequent purchase of goods and services without the benefit of competitive bids, with the result that FUNDEAGRO deals with an inappropriately small number of suppliers, and that it has rented automobiles from and paid honoraria to relatives of members of its staff;

3) inadequate observance of its own norms for granting travel advances and reimbursing expenses, with the result that FUNDEAGRO personnel are granted advances for travel when they have not filed expense reports documenting previous advances, and that they are granted advances for expenses that are not eligible for reimbursement; and

4) inadequate accounting control over specific expenses within the broad budget categories of the FUNDEAGRO work plan.

All of these deficiencies were symptomatic of an inadequate financial control system, without which FUNDEAGRO was deemed unable to sustain itself administratively.

When queried about practices such as those cited in the Price Waterhouse report, FUNDEAGRO responded that it has on a number of occasions requested guidance from USAID/Peru regarding administrative and financial matters, and that the mission has been unresponsive (e.g.,FUNDEAGRO 1990).[1] For example, FUNDEAGRO claims

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[1] At the time these queries were made, FUNDEAGRO had not seen the Price Waterhouse report, although the final draft version had been made available to the evaluation team. Furthermore, USAID/Peru requested that the evaluation team not discuss the contents of the report with FUNDEAGRO. Thus, FUNDEAGRO's

that USAID delayed for nearly a year in bringing the problem of ineligible expenses to its attention. In addition, following a May 1989 meeting between FUNDEAGRO and USAID/Peru to discuss the large number of ineligible expenses, USAID/Peru promised that it would prepare a memorandum providing FUNDEAGRO with specific guidance on eligible and ineligible expenses under ATT. As of mid-June 1990, FUNDEAGRO had not received the promised memorandum.

USAID/Peru concedes that it was negligent with respect to the financial management problems currently confronting FUNDEAGRO in that it did not fulfill its responsibilities at the outset of the project. According to the mission, the grantee eligibility requirements specified in Handbook 13 were largely ignored in the design of ATT, and the required pre-award survey was never conducted. Had the mission followed established procedures at the design stage of the project, the deficiencies in FUNDEAGRO's administrative and financial systems would have been detected, the management problems currently facing the institution would have been anticipated, and corrective measures could have been taken from the outset of ATT.

However, USAID/Peru disputes FUNDEAGRO's assertion that it has been unresponsive. It denies that it delayed in bringing the problem to FUNDEAGRO's attention, and cites a series of regular meetings between representatives of its Controller's office and FUNDEAGRO to resolve the problems of the ineligible expenses. In addition, USAID/Peru notes that it agreed to make twice monthly advances to FUNDEAGRO instead of the normal practice of making them once a month. This reflected the mission's sensitivity to how serious the disallowed expenses could be to FUNDEAGRO, since it receives no counterpart funds against which disallowed expenses may be charged. It indicates that the continuing submission of ineligible expenses was indicative of an uncooperative attitude with respect to financial management that could be interpreted as bad faith. According to one USAID/Peru official, FUNDEAGRO has taken advantage of the mission's initial negligence and is not interested in implementing more rigorous financial controls.

In summary, there have been significant problems in the management of ATT by FUNDEAGRO. It is beyond the scope of this mid-term evaluation to make a definitive assessment of responsibility for the management difficulties. However, these should be studied in detail and addressed in a definitive fashion at the earliest possible date. The unresolved questions and doubts are creating a mutual lack of confidence between FUNDEAGRO and USAID/Peru, and the problems are not unknown to the other institutions participating in ATT. As a result, FUNDEAGRO's management of ATT

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oral and written responses regarding management problems were necessarily of a general nature, and could not address the specific comments of the Price Waterhouse report.

is frequently called into question and its credibility as a foundation capable of acting as a mentor to the agricultural sector is undermined.

(2) As an independent organization

As indicated above, FUNDEAGRO has shown little development as an organization with a mission beyond that of acting as an implementing agency of the ATT project with respect to securing additional funding needed to become self-sustaining. The Price Waterhouse report states that 99 percent of its financial support comes from ATT. However, it should also be noted that similar foundations established in other Latin American countries (e.g., FUNDAGRO, in Ecuador, and Fundación Chile) under more favorable economic, financial, and political circumstances have required significantly longer periods of time to come into their own than has thus far been given to FUNDEAGRO. Despite a large initial endowment, for example, Fundación Chile required seven or eight years to become financially self-supporting (Coutu, personal communication).

e. Organizational structure and personnel

The Price Waterhouse report discussed above (Gaviria 1990) indicates several deficiencies with respect to personnel. These include:

1) the lack of an established, written procedure for contracting personnel, and lack of adherence to the stated procedures in areas such as competitive recruitment;

2) lack of formal evaluation criteria for personnel, with evaluations being based on subjective assessments of FUNDEAGRO's management and observations by members of the staff with no formal responsibilities in this area; and

3) the authorization of raises based on subjective evaluations, and the existence of differential wage rates even though there are no definitions of job categories.

As noted above, FUNDEAGRO has not had an opportunity to respond to the observations of the Price Waterhouse report, and it is difficult make definitive recommendations regarding its personnel practices until it does. However, its informality in this area has been observed by other institutions in ATT, and it is perceived as being excessively "club-like."

This undermines FUNDEAGRO's legitimacy when it is involved in discussions about the recruitment of personnel with other institutions. For example, when UNA completed a formal competitive hiring procedure for a national advisor in the area of

livestock, to work under a two-month contract, and requested that FUNDEAGRO proceed with hiring the specialist, FUNDEAGRO demanded to be provided the c.v.s of the three other leading candidates who were not selected. This may have been appropriate had the person selected not been a livestock specialist as the project had specified was to be hired. Since he did have an appropriate technical specialty, however, the demand constituted an intrusion into the internal affairs of UNA that went well beyond what is usually permitted a foundation. The incident itself arose out of the confusion between FUNDEAGRO's conflicting needs to develop as a private foundation and its administrative responsibilities as an ATT implementing organization, which have already been discussed. FUNDEAGRO maintains that it was simply complying with USAID/Peru requirements when it demanded the additional c.v.s. However, FUNDEAGRO's own informality in the hiring area undermines its legitimacy to exercise such control over other ATT institutions, which do have established and observed hiring procedures.

FUNDEAGRO's informality is also apparent other areas of activity. For example, it has formed a "Consejo Consultivo" to advise it on agricultural development issues and provide entré into circles that might prove to be sources of funding. The 36 individuals on the consejo include a number of former ministers, parliamentarians, internationally known financial experts, and leaders of private industry. Such a group indeed represents a powerful brain trust for FUNDEAGRO, and it could provide access to significant resources. When asked how the individuals were selected, however, FUNDEAGRO's response was that they were "friends." There has never been a meeting of the "Consejo Consultivo" as a group, and it was unclear how many are actually aware of their association with FUNDEAGRO. We do not mean to imply with this observation that FUNDEAGRO is guilty of anything more serious that zealous promotion. However, this sort of informality nourishes the image of FUNDEAGRO as a club and undermines its efforts to establish itself as a mentor to the agricultural sector.

2. INIAA

a. Actual and potential resources

INIAA is suffering a major shortfall in the resources that were anticipated for carrying out its role in ATT because it has received none of the counterpart funds from the Peruvian government anticipated in the Project Paper. As a result grant funds from USAID/Peru are being used across the board to insure that priority areas of project activity are carried out approximately on schedule. As a result, by the end of 1990 INIAA projects that it will have spent 85 percent of the funds intended to sustain its participation through the end of the project, in 1993. At the present funding level, INIAA must decide if it will continue to conduct activities in all areas of ATT, in which case, it will be able to sustain its participation in the project for a few months

into 1991, or it must define a small number of priority areas into which to channel remaining resources, in which case it may be able to continue to conduct TTA activities for most of the year. All of the people interviewed agreed that, in the absence of a radical restructuring of ATT, USAID/Peru is unlikely to provide INIAA with the additional funds that would be required to sustain its participation through the end of the project.

Some have suggested that INIAA does have several options it might pursue in order to generate new outside funding. Agricultural development project funds from the World Bank could be accessed, for example, if the Peruvian government were to honor its commitment to provide counterpart funding. Similarly, if INIAA were to tailor its activities to coincide more closely with USAID/Peru priorities in areas such as fomenting rural development opportunities that reduce the pressures on rural populations to participate in narcotics production. It has also been suggested that INIAA programs currently funded by ATT could be reprogrammed into contract services for commodity producer associations, on the basis of a matching funds arrangement. Possible candidates for this include potato production Cajabamba, the central sierra, and Cuzco; research in support of improved nutrition and management of dairy cattle in Arequipa; and soybeans in the Piura/Tumbes region. There are also possibilities for securing funds from bilateral donors for specific project areas, an area in which INIAA has been successful in the past.

In the present context of economic crisis and political uncertainty, it is difficult to assess how practical any of these alternatives are. What is clear is that INIAA is heavily dependent on ATT funds to carry out research activities, and to expend these monies without tapping an additional source of revenue will mean the end of a significant portion of INIAA's program. Over the past decade Peruvian government support for INIAA has declined from has declined from approximately $23 million a year to about $7 million a year. Peruvian government funds are dedicated almost exclusively to paying the salary of direct hire personnel, most of whom perform bureaucratic functions. Research has depended increasingly heavily on funds from foreign donors that have paid for projects executed by contract personnel. At present, INIAA's contract personnel are hired under four major projects, with 52 percent, or 386 people, being paid under ATT.

The important issue confronting ATT with respect to INIAA is that, thus far, the project has failed to change the way INIAA uses it research resources. While there has been some consolidation of research stations, this has been largely in response to the implementation of Peru's regionalization legislation, which requires that some of the stations be turned over to the new regional governments. In fact, while ATT states its objectives in working with INIAA in terms of the consolidation and integration of research, INIAA has spread its limited resources more thinly than ever. For example, ATT was to support 15 INIAA research

program; however, since the project began, the number of research programs receiving support has increased to 25, within which INIAA is conducting over 1300 discrete research projects. As a result there is seldom the necessary concentration of equipment, qualified people, or money to permit INIAA to conduct an effective research program.[2]

b. Capacity to attract and retain personnel

Because of the financial hardships it has suffered over the past several years, INIAA has lost a large number of talented researchers. However, most observers with whom the evaluation team spoke feel that it has not lost the critical mass necessary to function as an effective research institution. Many are of the opinion that the loss of personnel has, in fact, represented a healthy pruning for INIAA. Additional employees will be departing INIAA in the upcoming weeks and months as the legislation dividing Peru into regions with substantial self-government authority is enacted. As this occurs a number of INIAA facilities and many of its professionals will pass over to the jurisdiction of regional authorities. It is hoped that INIAA will emerge from this process as a leaner, less bureaucratic institution.

Within the contract personnel paid under ATT and other externally funded projects, salaries are generally regarded as adequate to attract and retain personnel. The problems in this regard lie in the areas of delays in payment and salary structure. Delays in payment are chronic, and the constant devaluing of Peruvian currency makes the impact of the delays disastrous.

A secondary issue is that the present INIAA salary structure makes no distinction between a professional performing research-related tasks and one whose duties are essentially bureaucratic. Thus, there are no rewards built in for excellent research. There are hopes of reorganizing the salary structure more along the lines of a research station model, with rank and salary based on research achievement, publications, and so forth. The legislation defining the regionalization of Peru contains language authorizes the drawing up of statutes that will give INIAA the necessary autonomy to define its own salary scale. It remains to be seen if the incoming Peruvian government will commit the funds to INIAA necessary for the new salary structure to be implemented.

Ironically, the ATT project robbed INIAA of what was potentially an important tool in establishing the resource base needed to

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[2] The evaluation saw many dedicated researchers conducting important experiments and showing extraordinary resourcefulness in scraping together money and materials. This observation is not in any way intended to be critical of them. The problem lies in the failure of INIAA to consolidate dispersed activities into sustainable research programs.

implement a new salary structure. FUNSIPA was created in 1986 to provide INIAA with financial support in ways similar to how FDA supports UNA, and to how it is hoped that FUNDEAGRO will provide support to the entire agricultural sector. Unfortunately, when FUNSIPA was sacrificed to establish FUNDEAGRO nothing was left in its place to service INIAA, and the institution was left in a more financially dependent position than it had been prior to the implementation of ATT.

c. Need for new technology and equipment

Prior to the present economic and financial crisis INIAA had assembled a substantial stock of vehicles and research equipment. While there are acute shortages and deficiencies in specific areas, its basic stock of equipment is generally sound. The level of technology that the equipment represents, while often not state of the art, is adequate for immediate tasks. The major needs that have appeared are in the areas of maintenance and allocation. Large numbers of serviceable vehicles have ceased to function for lack of maintenance, money to buy gasoline and oil, and spare parts. Laboratory equipment stands idle because of a lack of funds to purchase what often appear to be trivially simple replacement parts and consumable goods like paper filters and plastic tubing. If INIAA consolidated its research activities into fewer experiment stations and rationalized the lines of research being conducted in each one, laboratory equipment that is currently dispersed around the country could be concentrated in a fewer number of stations in order to create fairly complete and functional facilities for work in prioritized areas.

d. Freedom from short-term political pressures

A major concern of ATT is that INIAA be insulated from the political patronage system that characterizes the Ministry of Agriculture, in order to maintain continuity in setting and executing research priorities and retaining qualified personnel in positions of responsibility. Such insulation would also permit the redefinition of salary scales and career incentives to more closely resemble those of a research institution than a bureaucratic agency, as noted above. As also noted above, the legislation defining the regionalization process authorizes the drafting of statutes which would grant INIAA much of the autonomy it seeks. The drafting of these statutes has been completed, and their final approval is expected any day, as this report is being written.

It is presently difficult to assess what the impact of the new statutes will be. On the one had, they do offer several of the points that have been considered keys to insulating INIAA from short-term political pressures, including the authority to establish a research-station-type pay scale, and to name a board of directors representing the Ministry of Agriculture, private

agriculture and agroindustry, and UNA. However, the key issue of hiring and firing the director of INIAA remains unresolved. The statutes envisioned that the Minister of Agriculture would appoint the director, as is currently the practice, but that, once named, the director would serve at the pleasure of the board of directors. Thus, an INIAA director could resign, or be fired by the board of directors, but would not be replaced every time there is a new Minister of Agriculture. As this report is being written, the present Minister of Agriculture has rejected the provision of the statutes that would deny him the authority to fire the INIAA director. However, there is hope that the future minister, who will be taking office with the upcoming change of government, may assume a different position.

3. FDA/UNA

a. Capacity to support ATT in teaching, research, outreach

UNA has substantial capacity to support specific objectives of ATT in areas related to research, training, and publication. It has a long and prestigious history in Peru as one of the premier agricultural universities in the hemisphere, and there is broad support among its alumni for assisting UNA in regaining its former preeminence. The prolonged economic crisis has had different impacts in different areas of UNA's physical facilities, because some departments have been successful in maintaining ties with foreign donors who have assisted in covering maintenance costs and acquiring new equipment. UNA has sophisticated equipment and is using it to maintain active research programs in some areas, including bio-chemistry, food technology, and plant pathology. Entomology is an historically strong department, and continues to be very active and productive. Forestry continues to have one of the most distinguished faculties in South America, and it has maintained strong ties with organizations such as the Nature Conservancy, which provide assistance in maintaining an active program. The major limiting factor in the case of the departments that have been able to maintain their physical plants and research programs is the sporadic provision of electricity and water. This problem has become acute in the last six months, and is increasingly limiting the conduct of research and teaching activities. In other areas, UNA has suffered from substantial physical deterioration because of lack of funds for maintenance, and the purchase of new equipment.

In the area of human resources, UNA offers tremendous potential and suffers from substantial problems. During the past year UNA salaries have declined by over 50 percent. Junior faculty members currently earn about $40 a month, and senior faculty with responsibilities as department heads and deans are earning between $160 and $200 a month. In some cases faculty members are able to supplement these salaries through externally sponsored research,

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which enable them to continue contributing to the program of UNA, despite the low salaries. In other cases, however, UNA professors are resorting to driving taxis, working as waiters, and numerous other second jobs in order to make ends meet. Working multiple jobs means that they are dedicating only the minimum amount of time to teaching and research, and the combination of demoralization and physical fatigue has caused declines in the quality of the time that they do dedicate to UNA.

The quality of students also varies considerably. On the one hand UNA attracts students from the best private high schools in Peru, where they have received excellent training, despite the crisis the country is experiencing. Public high schools have historically varied considerably in the quality of the education they provide, but almost all have deteriorated substantially in recent years. Because of the economic crisis, even the best students often find it difficult to complete their theses and earn their degrees.

Despite the many difficulties, UNA has ambitious plans for restructuring its curriculum to make it more responsive the current conditions in the Peruvian agricultural sector and to the increasingly urban background of its student body. These plans include a obligatory semester (the eighth semester in the academic program) in the field, during which students would spend six weeks each in UNA research institutes located the coastal, highland, and Amazonian areas. There are also efforts to establish closer ties with farmers and with INIAA, in order that research is less academic and more closely tied to solving current agricultural problems.

b. Adequacy to administer and implement ATT activities

Two major structural factors -- one negative and the other positive -- have been cited as influencing the capacity of UNA to administer and implement ATT activities. The negative factor is UNA's decision to adopt a collegial approach to the management of its participation in ATT. Under this approach, UNA has named a committee rather than an individual manager of ATT. The committee has a chair which represents UNA before other institutions and insures that it speaks with one voice. But, internal management decisions are made collectively. Similarly, rather than hire national advisors to assist with its ATT activities, UNA has proposed using the funds for national advisors to contract members of its faculty with appropriate training and expertise for this purpose. Thus, there would be no full-time national advisors at UNA, but a number of faculty members would be carrying out these tasks on a part-time basis. UNA's reasoning on this point is that such an arrangement fits in better with its democratic, decentralized organizational structure, and that it provides financial incentives for faculty members to assume an active role in the project. For example, a professor who is currently working

part-time away from the university may find it financially worthwhile to return to the university. FUNDEAGRO initially resisted the management of the project by committee, but an agreement was eventually reached which permitted this arrangement to move ahead. UNA's plan for the use of the national advisor funds has also been received without enthusiasm, and whether or not this will move ahead as UNA wishes remains in doubt at this writing.

Objections to the UNA approach to managing ATT have arisen in three areas, two of which appear to be largely spurious. First, it has been argued that the committee approach will complicate decision-making and make UNA unable to respond to opportunities and problems in a timely fashion. However, the current economic and political crisis and the internal organizational problems confronting other ATT implementing agencies have caused the project to be implemented at decidedly sub-light speed. Thus, while the other organizations are certainly more centralized in their decision-making, there is no evidence that they are more agile. In addition, following the delay in the beginning of UNA's participation in the project, UNA has moved decisively to implement those activities that correspond to it.

The second objection arises from pique that UNA would suggest that it has sufficient internal expertise to forego the hiring of national advisors from outside the university. The problem here seems to be that UNA's attitude is interpreted as arrogant In fact there is no reason at present to doubt UNA's claim of possessing the necessary internal expertise, and until there is concrete evidence that necessary expertise is lacking objections to the arrangement on these grounds represent an unwarranted intrusion into internal management decisions.

The third objection is that UNA's actual and proposed administrative arrangements make it more difficult for FUNDEAGRO to exercise the financial supervision that USAID/Peru requires. Related to this is a concern that UNA's arrangement could be a disguised way of directing ATT resources to favored faculty members, and using them as rewards of political patronage within the university. While there is little evidence of problems actually existing in this regard, there are no built in guarantees that this will not happen, either. However, UNA's reasons for wanting to manage the problem in this way are compelling. The solution appears to be in drafting a sufficiently detailed memorandum of understanding that will address the administrative concerns that FUNDEAGRO or USAID/Peru might have. Provisions might, for example, limit the number of university committees on which membership signifies a payment from ATT that an individual may serve on over a specified period of time.

Aside from the tremendous talent contained in its faculty, UNA's major asset with respect to ATT administration and implementation

is the FDA. FDA is a private foundation established to carry out three major functions on behalf of UNA. These include:

1) the administration of funds from UNA's unidades de producción, which produce and goods and services for sale as a source of funds for the university;

2) the administration of funds to support externally financed research projects; and

3) the definition and administration of convenios with private donors to UNA.

Thus, FDA provides UNA with a relatively agile, private-sector source of support that can seek out and take advantage of fund-raising opportunities that are closed to a state institution like UNA. FDA has not yet been subjected to the same kind of financial scrutiny that the Price Waterhouse team conducted of FUNDEAGRO, so it is not possible to make many specific observations (positive or negative) about its financial management practices. However, it is currently managing 58 different project accounts and is providing significant support to several UNA programs.

Several factors can be expected to increase FDA's contribution to UNA in the near future. First, as the administrator of UNA's unidades de producción FDA will play a major role in conducting the "field semester" of the revised university curriculum. Second, in part as a result of its participation in ATT, FDA is actively seeking new sources of support for UNA. For example, the possibility of establishing an alumni association for UNA, under FDA administration, is being explored. If successful, this effort will provide an important mechanism for focusing financial and other types of support for UNA by a very distinguished body of alumni. Finally, as a result of its participation in ATT, FDA is in the process of being certified as a PVO by A.I.D. This will facilitate its receipt of funds from USAID/Peru under ATT as well from other mission activities, and it will open new possibilities for funding from other external sources.

4. ONA

a. Origins

ONA was established in June 1980, in the closing weeks of the military government of Morales Bermúdez. Its function was to provide an organizational umbrella for the producers' organizations (usually comités de productores), which were reapppearing or being organized in the wake of the agrarian reform of General Velasco Alvarado (1969-75). Under the military, farmer organizations associated with pre-reform rural landlord interests were suppressed, with the result that many disappeared and those that continued to function did so extra-officially, or even

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clandestinely. The military government attempted to organize the forms of rural property created or recognized by the agrarian reform into state controlled institutions, the most significant of which was the Confederación Nacional Agraria (CNA).

The institutions created by the military suffered from two essential weaknesses. On the one hand, once the changes in rural property relations that the agrarian reform signalled had begun the state created institutions were unable to respond swiftly or fully to the popular expectations that had been created. Ultimately, they came to act as a brake on the social processes that the military had either set in motion or legitimated. Second, while the agrarian reform did put a formal end to the hacienda system, which had been in a period of decline for some time, it did not resolve the conflicts between competing class interests within the agricultural sector. Instead, it tried to subsume them within state institutions, where they were to be mediated within a framework of state-controlled technocratic decision making. The result was that positions assumed by the CNA represented a "lowest common denominator" approach, in which no one was satisfied. Thus, the institutions created under the military to represent rural interests had a tendency to fragment according to the specific interests of different sectors of their membership. In some cases, this fragmentation was closely tied to the activities of particular political parties, which saw one or another sector of the rural population as an actual or potential constituency.

While the agrarian reform irrevocably changed rural property relations in Peru, it did not address a range of policy issues which had created an increasingly unfavorable climate for agricultural production for several decades. The practice of import subsidies was continued and expanded, retail food price controls were strengthened, and patterns of public investment in infrastructure to favor export industries on the coast were perpetuated. As a result, the crisis in the agricultural sector which had generated the pressures culminating in the agrarian reform continued with the major difference that the state, rather than landlords, now monopolized access to land, inputs and other key resources for agricultural production.

The costs to the state to maintain this apparatus were enormous, and it was unable to continue supporting many of the institutions it had created. Beginning in the Morales Bermúdez government, agrarian reform structures began to be dismantled and much rural property began to return to private hands. This process was accelerated under the Belaúnde government, which was elected in 1980 and held power until 1985, when the present outgoing government, of Alan García was elected. Former landowners were allowed to reclaim parts of the properties that had been expropriated under the agrarian reform; lands adjudicated to state-created cooperatives were in many cases divided as individual holdings among the cooperative members, with the cooperatives

retaining only limited functions in areas such as commercialization and input purchase; and committees of private producers reappeared.

ONA arose to shape these gremial organizations into a national force in defense of agricultural sector interests generally, and of private property in particular. In the words of one of its senior officers, it is a "gremio de gremios." The transfer of the property of the former Sociedad Nacional Agraria (SNA), an association of hacendados expropriated by the military during the agrarian reform under the Belaúnde government represented something akin to official approval to take the lead in organizing a national, private gremial structure. In this effort, ONA has demonstrated considerable success. It now counts more than 400 producer organizations among its membership, and estimates that through them it represents the interests of approximately 400,000 Peruvian farmers.

b. Changes to date and future development

As its position at the head of Peru's agricultural producers' associations become more secure, ONA has become increasingly interested in providing services to its membership. This interest has multiple roots. Some are related to the fact that, as agricultural private property appears more secure many farmers may find the need for active involvement in gremial organizations to be less pressing. In addition, for important parts of the agricultural sector, private property as such is less of an issue than it was for the organizations that formed the initial base of ONA support. Thus, ONA needs to respond to farmers' changing perceptions of their needs in order to maintain and expand its membership base. A second reason for the expansion of the services ONA provides is that, as it moves ahead with its mission to define and defend the interests of the agricultural sector, ONA must concentrate on a series of very specific issues related to oligopsonistic marketing structures, subsidized agricultural imports competing with national production, access to agricultural credit, and strategies for improving agricultural productivity, to name but a few. This will require more detailed knowledge and more sophisticated analysis of the conditions of agricultural production in Peru on the part of ONA and its members than currently exists.

ONA took an important steps toward becoming a more service-oriented organization with the signing of an agreement with USAID/Peru in June 1985. Under the agreement, USAID donated $170,000 to ONA to permit the establishment of the Centro de Estadística y Análisis Económico (CEAE). Under this project CEAE conducted a number of research and education activities, related to 1) basic production information, markets, and commodity prices; 2) production costs; 3) farm management; and 4) agricultural policies.

Under ATT, ONA has continued its efforts to expand in the area of the provision of information-based services to its members, and to conduct activities in support of agricultural interests that are at once more broadly based in the sense of reaching beyond short-term concerns of its original core of members, and more finely tuned in the sense of addressing a variety of specific technical and political problems. CEAE has been upgraded to the "Gerencia Técnica," one of four line divisions in ONA's organic structure. This new division is responsible for providing a number of services to ONA members, including 1) farm enterprise management; 2) production cost studies; 3) policy analysis; 4) economic studies; 5) the creation and maintenance of a comprehensive statistical database; 6) a publications program; and 7) the establishment of a computer system to process and analyze agricultural information as well as to improve the accounting procedures required to administer ONA's increasingly complex organization.

Two sets of issues confront ONA as it moves ahead with the expansion of the services it offers to members. The first is the need to define the kinds of services that are in demand by farmers, and, more importantly, to define those that it can provide efficiently within its institutional mandate and the resources it has available. For example, outside of ATT, ONA has become involved in the purchase of fertilizer, and, in fact, had fertilizer stored in the basement of its Lima office at the time of this evaluation. This is clearly a high-risk activity for ONA, and it has had several institutional "close calls" resulting from rapid changes in prices.

Similarly, as part of its technology transfer and commercialization activities outside of ATT, ONA contemplates the establishing or supporting enterprises which would provide services to farmers in these areas. Some ONA officials who discussed these activities expressed strong reservations. They indicated that, should the institutions prove successful, they could become bigger and more powerful than their parent organization, and distort ONA's priorities away from serving the interests of the farmers that are its original reason for existing. On the other hand, should such activities not be successful, some expressed the view that they could constitute a financial drain that divert resources from farmer service and, perhaps, threaten ONA's capacity to sustain itself financially.

These concerns are directly related to the second set of issues, which have to do with competing visions within ONA of the extent to which the organization should be a provider of services at all and the extent to which it should confine itself to its original gremial mission. ONA's top leadership is divided on this point, and observers in and outside of the institution, indicate that the membership is currently approximately evenly divided regarding which of the two visions they find more appealing. This is currently an important issue in the internal politics of ONA, and some people interviewed indicated that it is sufficiently serious

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that the organization could split if the situation is not handled with extreme delicacy. Obviously, this would have serious implications for ATT, which is working with ONA on the strength of its broad representativeness of the agricultural sector. In this context, ATT should exercise considerable care in providing ONA with funds to expand its service role until their relationship to the original gremial mission is resolved. While the idea of supporting ONA's efforts to expand the services it provides is sound in terms of ATT objectives, external funds and incentives to move the institution in this direction could have a destabilizing effect.

C. RECOMMENDATIONS

1. Project-wide recommendations

The most important issue confronting the ATT project as it is currently constituted is the confusion of FUNDEAGRO's roles as a foundation with a mission to guide and support agricultural sector development activities with its functions as an ATT implementing agency whose duties include relieving USAID/Peru of some of the administrative responsibilities associated with the project. To correct this, funds for paying ATT project managers and associated in the four implementing agencies should go directly to the respective agency. Similarly, the contracting of national advisors should be the responsibility of the institution they will advise, and FUNDEAGRO should be relieved of administrative responsibility for this activity.

The major difficulty in implementing this recommendation is that there are presently obstacles to direct disbursements to each of the four implementing agencies. Because of debt sanctions, USAID/Peru is restricted in its authority to disburse additional funds directly to public sector institutions (INIAA and UNA). In the case of UNA, this problem will be eased with the pending approval of FDA's PVO status, which should occur within the next 90 days. The situation is somewhat more complex in the case of INIAA because, since FUNSIPA was dissolved in the creation of FUNDEAGRO, there is no facilitating mechanism in place. The present organization of ATT, the organizational structure recommended in this report, and a transitional structure for getting from one to the other are illustrated in Figures 1 (p. 23), 2 (p. 29), and 3 (p. 30), in the previous section entitled "Background".

Such a reorganization of the project will leave FUNDEAGRO with responsibility for those activities that, in the opinion of the evaluation team, are appropriate for a foundation. The core of these activities is found in components 1c (competitive research grants) and 3c (competitive scholarships) of ATT. Component 2b (technology transfer enterprises) is also an appropriate activity for FUNDEAGRO. However, it should be reoriented so that it is

focuses on stimulating demand for technology transfer services rather than the current practice of making relatively large, high-risk investments to establish technology transfer enterprises. Similarly, FUNDEAGRO provides an important service under component 2c (seed program) in the area of promoting seed certification. The recommended modifications in components 2b and 2c are discussed in detail in the sections of this report dealing specifically with those components.

USAID/Peru also needs to become more responsive to financial management issues within the project, particularly with respect to FUNDEAGRO. While it is true that FUNDEAGRO suffers from a number of administrative deficiencies, it is also true that they have made efforts to discuss these with the mission and received unsatisfactory responses. For example, FUNDEAGRO was alerted to the problem of ineligible expenses only after it had been recognized within USAID/Peru for nearly a year. More than a year passed from the time that FUNDEAGRO requested and the mission promised to provide written clarification regarding the ineligible expenses and when such clarification was actually delivered. In addition, USAID/Peru has been inconsistent with regard to whether or not certain expenses are eligible or not. In order to remedy this problem, the mission should place someone in FUNDEAGRO's ATT secretariat with the authority to review and approve of disapprove expenses.

2. Institution-specific recommendations

FUNDEAGRO needs to adjust its internal management in two areas. First, it needs to clearly separate its ATT project responsibilities from its vision of its own medium-to-long term institutional growth. This involves assessing what its needs and its means for satisfying those needs are without ATT and organizing itself with these internally defined institutional priorities in mind. Second, it needs to become more entrepreneurial in selling itself as an institution capable of making important contributions to agricultural development Peru. This means becoming more active in seeking funds from sources other than ATT. To date, the possibilities of securing private foundation support have not been explored systematically. Indeed, FUNDEAGRO has no in-house expertise in proposal writing and other institutional development activities normally associated with private foundations. This expertise does exist within the ATT structure, in FDA, and it has been successful in securing this support for activities in other areas such as conservation (through the Fundación Peruana para la Conservación de la Naturaleza). FUNDEAGRO should move quickly to incorporate this kind of foundation development experience into its own staff, perhaps using the ATT project as a structure for working out a mutually acceptable arrangement with FDA/UNA to draw upon the experience its professionals have in this area.

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INIAA must move quickly to prioritize and consolidate its research activities in light of available funds and do what is necessary to adequately fund these activities. This will entail a much more drastic cut in research activities and the number of experiment stations that INIAA can support than has been previously anticipated. It must also seriously explore options for securing additional funding. Some possibilities were discussed in the paragraphs dealing with INIAA in this chapter.

FDA/UNA has a demonstrated ability to carry out the kinds of activities that ATT is attempting to promote. There is nothing inherently unworkable about the committee approach to the management of ATT activities that it wishes to use. Except to the extent that there are specific concerns about the same UNA personnel appearing on an excessive number of committee the sniping about this management structure should end. In cases where there are specific concerns of this type they should be addressed in detail in the convenios to be signed with FUNDEAGRO or other institutions.

ATT should be supportive of ONA's interest in becoming a more service-oriented institution. However, it should also recognize that this is a volatile issue within ONA at the present time. ATT needs to recognize that at this juncture excessive encouragement can easily be construed as interference in internal matters and act as a destabilizing force that could divide the institution and reduce its effectiveness. Until ONA defines the relationship that service and gremial activities will have to one another, it should continue to play a role in the ATT, but the project should maintain a low profile.

3. In anticipation of hard times

Symptomatic of the management problems described in this chapter and elsewhere in the report, ATT has been subjected to a series of financial shocks, each of which implies further drastic reductions in project funding. Accordingly, the following paragraphs offer suggestions about priority areas for support in a "worst case" funding scenario.

Because of its centerpiece role in ATT as the foundation which will provide support and guidance for Peruvian agricultural development, and because it has not yet secured the funding that will permit it to be more than a creature of USAID/Peru, FUNDEAGRO needs to continue receiving support under the project. In the event of further drastic reductions in funding, components 1c (competitive research grants) and 3c (competitive scholarships) should receive the highest funding priority. This is because these are the activities most closely representing the kind of role that a foundation can play to support an area, and because they are the activities that offer the greatest impacts for each dollar spent.

INIAA should, in theory, be a high-priority candidate to receive funding under ATT because it is the institution officially responsible for having an agricultural research program, and because of its dependence on the funding provided by the project to maintain that research program. However, in the context of further funding cuts, ATT could not provide enough money to keep this functioning at even a minimal level. INIAA needs to prepare a drastic "institutional triage" plan in light of an aggressive effort to secure additional external support for particular activities. The search for external support needs to focus on bilateral donors (rather than multilateral donors like the Inter-American Development Bank and the World Bank), and on possibilities for parts of its research effort being conducted on a contract basis with financing from producers' organizations. To the extent that INIAA cannot generate additional funding adequate to maintain a minimal program with a reduced level of ATT funding, USAID/Peru will need to consider cutting its losses and placing funding that had been destined for INIAA elsewhere.

FDA/UNA should receive a high funding priority in light of its potential of showing significant short-term results as a result of participation in ATT, and in light of the long-term importance that this short-term success has for Peruvian agriculture. However, it is also clear that FDA/UNA will carry out many of the activities ATT is supporting with or without the project. Change may occur more slowly, but it will occur. In light of the issues discussed above, an important area to maintain will be the provision of scholarships to enable people to secure their master's degrees, and to complete theses at the ingeniero agrónomo level.

Like FDA/UNA, many of the activities for which ONA receives ATT support will go ahead with or without the project. In addition, investment in ONA is potentially risky until the issue of the relationship between service provision gremial activity is defined. In light of this, in the face of further reductions in resources, ONA should receive a low priority for receiving funds.

CHAPTER VI

ATT and the War on Drugs

VI. ATT AND THE WAR ON DRUGS

USAID/Peru has indicated that there is a possibility that U.S. assistance to Peru will increase substantially in the next two years. The mission's FY91 budget may be triple the size of the present one, and an additional $100 million may be added to that in FY92. The increased U.S. assistance will be tied to combatting the illicit narcotics industry in four areas: 1) addressing Peru's balance of payments problem; 2) promoting stable, long-term economic growth; 3) creating alternative sources of income in coca-producing areas; and 4) mounting a public information effort. The actual release of this assistance will be conditional on Peru satisfying U.S. desires that it become more aggressive in the war on drugs, and that it adopt sound macroeconomic policies.

The guidelines for the application of these funds are broad, and the evaluation team was requested to consider the extent to which the additional money might be applied to ATT activities. Thus, while the potential contribution of ATT to the war on drugs does not figure in the terms of reference of the mid-term evaluation, team members did consider ATT with its potential contribution to the anti-narcotics effort in mind.

Based on this assessment, ATT is an appropriate vehicle for the use of funds that USAID/Peru may receive to promote development activities intended to reduce the level of participation in illicit narcotics production. This opinion arises from two considerations:

1) the severity of the administrative and financial difficulties experienced by ATT make it a very insecure vessel for any additional resources that USAID/Peru may receive; and

2) the portions of the Peruvian population that have benefitted from ATT activities have little relationship to narcotics production, and there is little that the project can do with its present structure and through it present activities that bear much relevance to the war on drugs.

As discussed in the evaluation report, ATT has suffered from severe financial management difficulties. The most serious have been associated with FUNDEAGRO, which has been found wanting almost across the board with respect to financial and administrative matters. Similarly, INIAA has not only been unresponsive to ATT project with respect to consolidating and integrating its research, but, has actually expanded the number of programs it is conducting. ONA and FDA/UNA appear to be managing their activities reasonably well. However, as indicated in the institutional analysis, an expansion in its role in ATT could be detrimental to ONA's institutional development because

of the unresolved issues regarding the relationship between gremial activity and the provision of agricultural development services. FDA/UNA has only recently begun to implement the activities that correspond to it under ATT, so it is difficult to assess its capacity to assume additional responsibilities. However, given the nature of FDA/UNA's activities, an expansion of its role in the name of the war on drugs would bear little relationship to the role defined under ATT. Under these circumstances, placing additional resources in the ATT project would in all probability amount to throwing good money after bad.

In addition, while the PP discusses ATT in terms of its contribution to agricultural development in Peru generally, and specifically talks about the importance of working with farmers in the "Trapecio Andino," the project as it is being executed is essentially oriented toward coastal producers of crops with real or imagined export potential. This portion of the population has little relationship to Peru's narcotics economy. There is little that one can do in the way of expanding ATT support to other segments of the population that can be defended as having significant implications for reducing the level of participation in the narcotics economy. To make such a contribution would require a reorientation of the project to population-expelling areas of the sierra, and in favor of employment generation and agricultural assistance for a poorer population than that receiving the greater part of the assistance from ATT on the coast. Even if ATT were going well such a mid-stream change of course would be a questionable decision. Given the problems discussed in this evaluation, ATT needs to focus on consolidation and improvement of performance within the present areas of activity that show promise of success. To attempt to expand the project into new geographic areas or into new activities aimed at different social classes will almost certainly assure failure across the board.

The portion of the population that can be most readily reached by development projects intended to provide alternatives to participation in the illicit narcotics industry is that which forms the bulk of the labor force; those who work as wage laborers harvesting, carrying and stomping coca leaves in the initial stages of transformation. Experience in Bolivia shows clearly that the alternative opportunities offered to this sector of the population do not have to compete dollar-for-dollar with the wages offered by the narcotics industry, but simply have to provide a stable, secure income that allows poor families to satisfy their consumption requirements by working on their farms or near their homes. This implies two kinds of activities: 1) on-farm agricultural development efforts that reduce the dependence of rural smallholders on off-farm income; and 2) employment generation activities in population-expelling areas that provide alternatives to migration to areas such as the upper Huallaga. With respect to the second point, rural infrastructure development and basic agro-processing industries are particularly

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good choices for support, because they increase on-farm incomes by expanding market opportunities and adding value to produce at the same time that they provide sources of local employment.

During the 1980s USAID/Peru has conducted projects which would have substantial potential for reducing participation in the narcotics industry if they were revived with that purpose in mind. Based on experience in Bolivia, a project such as Plan MERIS could have dramatic impacts by improving and expanding irrigation in strategic areas of the sierra. USAID-sponsored efforts to improve soil and water management in upland areas could have similar impacts, as could support for small business enterprises in the sierra. Based on our experience elsewhere and our experience with ATT, we strongly feel that USAID/Peru will be better served in its anti-narcotics efforts by pursuing these sorts of options than through modifications in ATT.

APPENDICES

APPENDIX A

NCSU/MIAC PROGRESS REPORT

EVALUATION OF THE RESULTS TO DATE OF TWO COMPONENTS OF THE ATT PROJECT

2b. ESTABLISHING A TECHNOLOGY TRANSFER SPECIALIST PROGRAM AND

3b. IMPROVING RESEARCH, TEACHING AND EXTENSION MATERIALS

COMPONENT 2. Activity a. Establishing a Technology Transfer Specialist Program

1. The Rate of technology adoption will increase by 10 to 20%.	1. A baseline study was conducted and the current rate of technology adoption was established. As a consequence of the study, the point of "adoption" has been established by determining the point at which the new variety became most widely accepted. - It has been suggested that further technology transfer efforts be completely coordinated with each research program so that efforts are not duplicated and that an adequate feed-back mechanism can
2. Recruitment and retention of postgraduate professionals will be increased significantly.	2. Since there has not been any funds available to contract professionals, there has not been any recruitment of new professionals. - From the beginning of the Project, two professionals have been selected and enrolled in the extension MS program at the UNA.
3. At least 55 specialists will be trained and actively incorporated into the corps.	3. There are 71 specialists assigned technology transfer activities in INIAA. Thirty-seven are assigned as specialists in technology transfer, working in more than one national commodity research program and thirty-four have been assigned as seed specialists in specific national commodity research programs. - The 34 specialists working as technology transfer specialists are working at the experiment station under the office of research projection and usually have responsibility to assist in transferring technology of the programs which do not have a specific specialists in TT. - The 37 seed specialists are also working at the experiment stations but under a specific research commodity program. They usually are in charge of the basic seed production program as well as validation plots. Many times, they do not have the time to "transfer technology" with all of the other responsibilities which they are expected to fulfill.
4. Arrangements and/or pilot programs will be in place with at least two national commodity programs.	4. Pilot programs have been set up with local committees of the rice growers association in Piura and Amazonas. The program in Piura has been in operation for over a year and the one in Amazonas has just been initiated.

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5. The technology adoption cycle will be reduced from 8-10 years to 6-8 years.

5. A study to establish the baseline adoption cycle has been established as a model in one area of Peru.

- As a result of the study conducted in the Chiclayo area, the adoption cycle appears to be correlated with the variety or agronomic practice that is being released as well as the area in which the technology is introduced. It is estimated that the initial technology adoption cycle for adoption of rice varieties is about 4 years from the point of release. It is estimated that the time required to release the new varieties is 6 years, for a total of 10 years.

- It was observed that rice varieties are being released about every nine years with the full span of use of the variety covering about 5 to 15 years after release.

6. Strengthen, broaden and increase researcher-specialist-producer clientele relationships of the national programs.

6. There has been direct involvement and support of clientele interactions through formal and informal agreements and activities. Almost every experiment station has assigned one or more specialists to act as the liaison between the Ministry of Agriculture personnel (extension) and INIAA researchers. In most cases, this has been the technology transfer specialist that is the director of the office of research projection.

- Other activities have been centered around specific technology transfer programs such as CTTA in which the INIAA personnel have worked with the providers of technical assistance and the Ministry personnel in extension.

- At least 12 of the experiment stations have conducted CTTA activities which involves the integration of research and those who provide technical assistance to carry out specific technology transfer campaigns.

COMPONENT 3. Activity b. Improving Research, Teaching and Extension Materials

1. Train three librarians and up-date the collection of 20 scientific journals.

1. This activity has been limited because of the delayed start of the UNA in the ATT project. A training program has been presented and will be funded to initiate this activity.

- A national agricultural information network has been developed and is in the process of being implemented with the UNA library as the central focal point.

- The INIAA library and experiment station libraries are ready to be included in this process and have submitted training programs as well as lists of scientific journals which they would like to see updated.

2. Publish a scientific agricultural journal.

2. The basic criteria for a peruvian national agricultural scientific journal has been developed. A survey of the options of publishing such a journal have also been explored with the option of supporting the UNA's scientific journal being selected as the most viable option. The main requisite for supporting this journal would be that the UNA open its authorship to non-university personnel and allow a broad base of subscribers.

- In lieu of positive action on the part of UNA to modify its regulations for the scientific magazine, FUNDEAGRO has been exploring alternative options to publish the magazine. There has been a concerted effort to collect

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scientific articles for publication, in the event that there is agreement and a magazine can be published.

3. Improve the flow of information to farmers via magazines, radio programs, etc.

3. The most striking accomplishment of this activity is the establishment of a technical magazine in INIAA. It was begun in 1989 with two issues being printed in 1989 and one in the first quarter of 1990. Each issue has had an average of 40 pages with over 20 technical articles dealing with new technology or recommendations for all of agriculture. It is open to authors within and without INIAA and has a editorial committee. There are about 800 paid subscriptions. Each issue has a printing of 2,500 copies. It usually has sections in two colors and sometimes in four colors. The text is edited and typeset using computer programs (WordPerfect and Ventura Publisher) and a laser printer. The magazine is distributed to many agencies and is increasing in circulation. It is designed read and utilized by providers of technical assistance, university professors, government agencies, researchers, progressive growers and interested public.

- Other publications have been edited and published as the results of activities of this Component 3b. FUNDEAGRO has published over 5 technical research publications as well as various instructive and publicity oriented pieces for research and technology transfer.

- The INIAA Technical Magazine Office and INIAA have also published other materials in transferring technology. They are collaborating in producing and publishing various prioritized documents. To date, over 12 documents have so published. They just completed a 650-page Corn Manuscript which was sponsored by CYMMIT.

- A study of mass media has been realized and the report has been utilized to formulate a project to fortify mass media in agriculture to improve the supply of information to them.

- A directory of agricultural researchers and their on-going projects was developed. There are over 700 entries.

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FINAL REVISION

SEMESTER REPORT OF PROGRESS OCTOBER 1, 1989 - MARCH 31, 1990
Component 2, Activity b: Stimulating Private Sector Technology Transfer Enterprises

I. STATUS OF MAJOR ACCOMPLISHMENTS

A. Project Outputs (Life-of-Project)

Description	Magnitudes
1. Technology Transfer (TT) Enterp.	
a. Techno. transfer enterprises	At least 10 enterprises established
b. Establish inter-institutional agreements, including agreements that foresee linkages with faculty and staff of UNA and regional universities, resulting in improved dedication and efficiency of ATT researchers/transfer agents and contributing to a sustained flow of appropriate improved technology to farmers.	At least 10 agreements in operation
c. Enterprises to be assisted in:	At least 10 enterprises assisted.
1. Improving researcher awareness of practical farmer problems.	
2. Establishing linkages with entities of the international research network for directly importing improved technology.	At least 4 reports per year.
3. Continuing analysis of key production problems; publication of reports about production conditions and problems requiring improved technology improved technology responses, and introduction, testing, adaptation and and adoption of a continuing flow of technology.	At least 4 reports per year.
d. Training of professionals to extend technology and to follow up on related research.	At least 40 professionals trained.

B. Accomplishments this Period

Description	Magnitudes Planned	Achieved	C. [illegible]
1. Technology Transfer Enterprises			
a. Cooperative agreements entered into establishing pilot TT enterprises.	5	1	5
- TT Enterprises legally constituted and officially registered.	6	6	6
b. Inter-institutional agreements approved	2	1	1
c. Number of enterprises assisted in:			
1. Methods and techniques of technology transfer	2	3	8
2. Obtaining technology from international sources	2	0	0
3. Production problem analyses preparation.	2(2)	2(2)	2(2)
d. Technical training courses executed	6	5	20
e. Marketing studies for technology services by TT enterprises completed	1	1	2
f. Feasibility studies for technical assistance services by TT			

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I. STATUS OF MAJOR ACCOMPLISHMENTS

A. Project Outputs		B. Accomplishments this Period			C. Cumulative Accomplishments
Description	Magnitudes	Description	Magnitudes Planned	Magnitudes Achieved	
(Continued...)					
2. Technical & Institutional Development Initiatives have established UNA as a Viable Farmer Services Organization	x	2. UNA Technical and Institutional Development			
		a. Farm records analyzed & reports prepared.	x	Will complete in April, 90	
		b. Farm management manual prepared	x	First draft will be completed 4/90.	
		c. Training events for technology transfer personnel	1	1	2
		d. Training events for farm leaders	3	1	2
		e. 1990 Implementation Plan prepared and approved	Final Approval	Final Approval	x
		f. Technical studies completed and published, as follows:	(16 published) (15 published)	(12 completed) (8 published)	(16 completed) (12 published)
		1) Agricultural policy			
		- current policy issues	2 published	0	6 completed 4 published
		- in-depth studies	2 published	2 completed 1 published	2 completed 1 published
		2) Marketing studies	1 published	1 published	2 published
		3) Agri business feasibility studies	1 published	1 published	2 published
		4) Agro-economic studies	1 published	1 published	2 published
		5) Agr. producers membership registries	1 general completed 9 regional completed	methodology in review	(in suspense until review completed)
		6) Product surveys & reports	2 published	2 completed 1 published	3 studies completed 1 published
		g. Cost-of production studies (for internal use)	2	2	2
		h. Product statistical summaries	4 published	3 completed 1 published	5 completed 2 published

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PROGRESS MATRIX

ACTIVITY 2c

Contributing Outputs	1988 This Year	1988 Cum.	1989 This Year	1989 Cum.	1990 This Year	1990 Cum.
1. Departmental Seed Committees formed and functioning	2	2	4	6	0	6
2. External quality control system in operation for rice seed.	0	0	0	0	4	4
3. Groups presenting project profiles for seed enterprise establishment/enhancement.	0	0	13	13	2	15
4. Groups with project profile approved and followed with feasibility study.	0	0	6	6	0	6
5. Number of new and/or expanding seed enterprises.	0	0	6	6	2	8
6. National Seed Enterprise Association formed and functioning	0	0	0	0	1	1
7. INIAA Seed Program established with prioritized experiment stations.	0	0	1	1	0	1
8. Number of seed-related professionals trained thru:						
a. National Seed Seminars (2)	47	47	70	117	0	117
b. One-week Short-courses						
i. Seed Quality Control (5)	40	40	87	127	0	127
ii. Seed Production and Marketing (5)	0	0	145	145	0	145
iii. Seed Enterprise Organization and Management (1)	0	0	0	0	29	29
c. One-days short-courses						
i. ~~Seed Groups~~ [illegible]	0	0	249	249	75	324
ii. Seed Distributions	0	0	41	41	40	81
d. External Training						
i. Observational visits/conferences	0	0	7	7	1	8
ii. Non-academic courses, studies/ research	0	0	3	3	3	6
iii. Academic degree (M.S. or Ph.D.)	0	0	0	0	0	0
9. Seed-related publications	1	1	2	3	0	3
10. Surveys and Promotion campaigns established	0	0	1	1	2	3

ACTIVITY 3a

HUMAN RESOURCE DEVELOPMENT

UNLM-TTA

Strengthening Administration and Teaching Programs

PROJECT OUTPUTS	CONTRIBUTING ACTIVITIES, LOP	PLANNED TO JUNE 1990	ACHIEVED TO DATE
1. Improvement in quality of UNA students.	-Analyze graduate student characteristics and quality in 1990 and in 1993	-Make 1990 analysis of students	- Analysis in progress, preliminary reports available. Study expanded to include information on the participation of women in agricultural science.
	-Revise entrance standards to the Graduate School.		
	-Establish an Orientation Week		
2. Improve planning, resource allocation and control by UNA.	-Establish an Administrative Review Committee.	-Establish Committee	-Committee established
	-Contract a National Advisor or external review team.	-Contract National Advisor	-delayed
	-Analyze the current administrative systems and practices 1990 & 1993.	-Analyze systems and issue reports	-delayed
	-Implement recommendations of external advisors.	-Implement recommendations	-delayed
	-Purchase equipment to improve internal and external communications.	-Prepare purchase orders and specs.	-Specs for communication prepared.
	-Establish Advisory Committee for Research.	-Establish Research Committee	-Committee established.
	-Send Vice Rector for Academic Affairs to the US on observational visit.	-Make invitational travel plans	-Plans made for visit 17th June to 4th July.
	-Develope processes for planning and prioritizing activities of UNA		
	-Develop Annual Research Plan	-Hold workshop on priorities in key areas.	-Taller held. Report ready.
	-Train leaders and middle managers Establish at least four courses in leadership, planning, and technical level activities.	-Hold a Leadership Conference	-plans delayed
3. Strengthen leadership role of Rector's office	-Arrange visit for Rector to US	-Arrange visit of Rector to US	-Rector visited US April 15th to May 11th
	-Establish an Alumni Association	-Plan details of Association	-Draft reglamentos prepared
	-Establish an external advisory council for UNALM		
	-Develop the University Foundation FDA to assume greater role.		

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HUMAN RESOURCE DEVELOPMENT
UNALM-TWA
Strengthening Administration and Teaching Programs

PROJECT OUTPUTS	CONTRIBUTING ACTIVITIES, LOP	PLANNED TO JUNE 1990	ACHIEVED TO DATE
4. Develop incentives program for individual excellence and performance	-Prepare policies and rules for the incentives system	-Establish the Committee on Incentives	-Committee has been appointed
		-Establish policies for incentives for professors and students.	-No report has been issued yet.
5. Revise the curriculum	-Establish Steering Committee at the University level for guiding the curriculum revisions	-Establish Steering Committee	-Committee established and working.
	-Establish Committees and working groups at the level of the Schools.	-Name all committes and commissions	-Committees named
	-Establish working commissions for the Graduate programs.	-Name commissions	-Commissions named
	-Revise 15 programs of study in the Graduate School.	-Committees and commissions begin work	-Work begun
	-Revise structure of undergrad curriculum.	-Hold two seminar-workshops	-Workshops held involving all committees and commissions
	-Contract National Advisor	-Name National Advisor	-Wilfredo Huerta appointed. Workshop reports prepared.
6. Creation of broad concenses concerning problems and priorities of Peruvian agriculture.	-Hold 12 regional "Conversatories"	-Hold 2 conversatories this period	-plans delayed
	-Organize 12 Campus Seminars on regional problems	-Organize 1 campus seminar	-delayed
	-Publish 3 reports on regional problems.		
	-Establish an external visiting committee for each School.	-Establish at least one committee this period	-One planned but not established
	-Provide for participation of 50 professors annually in national and international events.		
	-Support 5 conferences, congresses, organized by UNA		

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ACTIVITY 3c

TABLE 1. Comparison of present status with budget estimates made in early 1988.

Type of Scholarship	Numbers Budgeted 1/88	Numbers Status 6/1/90	Financial Budgeted 1/88	Financial Status 6/1/90
Observational Studies	28	37(37)	226,000	73,989
Impact Studies	24	19(11)	168,000	75,708
M.S. Degree	12	19(-)	525,000	570,000
Ph.D. Degree	4	10(3)	291,000	347,729
Administrative Costs	--	--	345,000	251,203
Total Contract	68	85(51)	1'555,000	1'318,629

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APPENDIX B

STATUS OF LIFE-OF-PROJECT OUTPUTS,

COMPONENT I

Status of Life-of-Project Outputs, Component I

PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned	MAGNITUDES Achieved (to 3/31/90)
ACTIVITY 1a. Consolidation and Integration of INIAA Research and Research Support Programs (R/RSP)				
		Implementing Institution: INIAA		
1. Quality & cost effectiveness of INIAA's R/RSP to be improved, as monitored and documented by Program reviews:		1. Agroecological zones defined (11).		
-"rapid"	3	2. "Rapid" internal reviews completed of all on-going RP's;	2	2
-external	46	summary published.	2	1
-internal	73	3. External reviews completed of 4 RP's: rice, cattle, maize, integr. crop protection (& potatoes - 05/90)	5	5
		4. Internal reviews of all livestock, food processing, & forestry RP's and 7 crops RP's (annual meetings).	22	21
		5. National advisors have assisted all crops, lvstck & food technology RP's.	18	18
		6. Tec adv comm's installed for 5 lvstck RP's.	9	5
		7. All RP's now have approved workplans.	21	21
2. RSP's to achieve planned staffing and efficient operation.	5	8. All RSP's have benefitted from nat'l advisor input.	5	5
		9. Support role of RP's to exp. stns. improved appreciably for agromet., seeds and agroeconomics.	5	3

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PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned (to 3/31/90)	MAGNITUDES Achieved (to 3/31/90)
3. Flow of improved technology sufficient to elicit tangible support from client groups. Targets:				
-new varieties	55	-new varieties	9	10
-basic seed	50m MT	-basic seed	3.8m MT	1.1m MT
-veg. seedl.	500m	-veg. seedlings	325m	325m
-in vitro propagules, tubers & fruits (no. of crops)	7	-in vitro propagules, tubers & fruits (no. of crops)	7	7
-virus-free var.	2	-virus-free var.	2	2
-improved agronomic practices	300	-improved agronomic practices	100	101
-improved an. husbandry practices	15	-improved an. husbandry practices	4	6
-technology transfer events	250	-technology transfer events	60	54
-publications	500	-publications	60	45
4. Active linkages of RP's with:		11. Linkages have been initiated, reactivated or maintained with:		
-Peruvian universities	80	-Peruvian universities	37	59
-CGIAR centers	20	-CGIAR centers	16	19
-Foreign univ.	40	-Foreign univ.	12	15
-Regional networks	30	-Regional networks	12	30
-Producer associations	50	-Producer associations	16	26
-Technical assistance services	30	-Technical assistance services	8	11
-Techn. gen. & transfer system in new political regions	11	12. Techn. adv. comm. for RP's installed, with univ. partic.	10	3
		13. Linkages with new political regions:		
		-framework conceptualized		
		-preliminary contacts in Grau & Inca	2	2

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PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned (to 3/31/90)	MAGNITUDES Achieved (to 3/31/90)
5. R/RSP's will be sufficiently mature (self-sustainable) to be assured of adequate political and budget support to sustain level of effort at end of project:		14. The "maturity" concept for R/RSP's is increasingly accepted by INIAA leaders as a practical framework for setting Program goals and measuring progress. Positive maturity indices registered for several R/RSP's: -updated problem diagnosis and feedback studies -relevant, effective, priority research -linkages with scientific community and users -continual validation of new technology -publications & techn. transfer -new funding sources		
-Mature RP's	18			
-Mature RSP's	5			
		15. National mtgs of R/RSP and/or Exp. Sta. Directors	3	3

ACTIVITY 1b. Strengthening the Adminstration and Management of INIAA's R/RSP's (Implementing Institution: INIAA)

1. Annual meetings of R/RSP's	50	1. Annual meetings have been held. -RP's	26	17
		2. Projected 4-yr plan for bi-annual mtgs developed.		
2. Evaluation mechanisms perfected and utilized -technical: internal external -management -impact		3. Guidelines approved for internal technical evaluat. by R/RSP Dir.		
		4. Techn. eval. now routine at all exp. sta. by R/RSP Dir. & Adv.		
		5. External technical evaluations	4	4
		6. Exp. Sta. management evaluation	1	1
		7. Simplified & more effective reporting system implemented.		

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PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned (to 3/31/90)	MAGNITUDES Achieved (to 3/31/90)
3. Improved mechanisms for research planning		8. Research planning has been conducted by several modes:		
		-R/RSP Dir. meet w/ Exp. Dir. (OPP conference)	1	1
		-roundtable of distinguished leaders	1	1
		-regional planning conf.	1	1
		-commodity workshop	1	1
		-discipline-oriented workshops	2	2
		-natl. planning commis.	1	1
		-regl. planning commis.	1	1
		-perm. techn. adv. comm.	10	5
		-technical analysis (techn. gaps)	1	1
4. Research design, biometry, & computational advisory service to RP's & exp. stns. will be operational.		9. Concept of advisory committee for biometry & comput. service developed.	1	1
5. Improved personnel evaluation system will be implemented.		10. Internal study of personnel eval. criteria was initiated.	1	1
6. Career development and incentives		11. In-service trng. for personnel of R/RSP's in several exp. stns.		
-in-service training		12. Shortterm training in neighbor countries.	26	30
-shortterm training, abroad (no. of trainees)	150	13. Publication incentive bonuses.		
-shortterm training, in-country (no. of events) (**)	100	14. Prof. soc. mtgs.	5	2
-post graduate study				
-publication incentives				
-improved salaries				
-participate in professional societies (no. of mtgs.)	20			

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PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned	MAGNITUDES Achieved (to 3/31/90)
ACTIVITY 1c. Expanding Research Opportunities (Implementing Institution: FUNDEAGRO)				
1. Increased participation of nat'l researchers in priority projects; increased morale and entrepreneurship of participants. Targets:		1. National symposium on research priorities	1	1
		2. Regional symposia on research priorities	5	5 (to 3/31/90)
		3. Project review group installed and acting according to guidelines		
		4. Projects funded	68	76
-nat'l research conference	6	5. Memorandum with INIAA for earmarked grants to support RP's; INIAA internal selection process in place		
-regional symposia	10			
-projects	250	6. Monitoring system in place for ongoing projects		
-publications, reports	500	7. Final reports	3	2
-papers at natl. prof. soc. mtgs.	250	8. Natl. & regl. seminar publications	6	5
-form/support active local & regional researcher networks	8			
2. Better, more relevant research proposals. Target: short courses on proposal development	10	9. Short course on proposal development	4	
3. Improved quality of graduates who participate		10. Thesis projects	21	
4. Projects funded at UNA in selected areas	4	11. Planning process in progress for UNA selected research areas		
-farm management				
-transport/mktg				
-irrig/drainage				
-agricultural mechanization				

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HANDOUT #1

PROGRAMAS DE INVESTIGACION Y APOYO

A LA INVESTIGACION DEL INIAA

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Programas de Investigación y Apoyo a la Investigación del INIAA

Programa	Sede	Año de inicio	Apoyo TTA
INVESTIGACION AGRICOLA			
Agrometeorologia	La Molina	1989	si
Agua y Suelos	La Molina	1989	si
Arroz	Chiclayo	1983	si
Camote	Chincha	1990	no
Cereales	Cuzco	1983	si
Cultivos Andinos	Puno	1987	si
Cultivos Tropicales	Iquitos	1985	si
Frutales	La Molina	1989	si
Hortalizas	Huaral	1990	no
Leguminosas de Grano	Chincha	1983	si
Maiz	Cajamarca	1983	si
Oleaginosas	Piura	1986	si
Papa	Huancayo	1983	si
Protección Integrada de Cultivos	La Molina	1987	si
Recursos Genéticos	La Molina	1987	si
INVESTIGACION AGROINDUSTRIAL			
Agricola	La Molina	1989	si
Pecuaria	La Molina	1989	si
INVESTIGACION FORESTAL Y FAUNA			
Productos y Transformación Forestal	La Molina	1989	no
Silvicultura y Manejo Forestal	La Molina	1989	si
Vida Silvestre	La Molina	1989	no
INVESTIGACION PECUARIA			
Bovinos	Arequipa	1987	si
Camélidos	Puno	1987	si
Cuyes	La Molina	1987	si
Ovinos	Puno	1987	si
Pastos y Forajes	La Molina	1987	si
PROGRAMAS DE APOYO A LA INVESTIGACION			
Agroeconomia	La Molina	1983	si
Centro de Cómputo	La Molina	1983	si
Semillas	La Molina	1989	si
Servicios de Laboratorio	La Molina	1983	si

Programas de Investigación y Apoyo a la Investigación del INIAA

Jefe del INIAA - Ing. Mario Pelaez
Director Técnico Executivo - Ing. Antonio Chavez

Programa	Nombre del Director	Nombre del Asesor
DIRECCION-GENERAL DE INVESTIGACION AGRICOLA		
Dir.-Gen.	Ing. Angel Oviedo	
Agrometeorologia		Dr. Walter Sanchez
Agua y Suelos	Ing. Justino Velasquez	Ing. Luiz Saez
Arroz	Ing. José Hernandez EEA Vista Florida	
Camote		
Cereales	Ing. José Parra EEA Andenes	
Cultivos Andinos	Dr. Angel Mujica EEA Illpa	
Cultivos Tropicales	Ing. Pedro Carrasco EEA San Roque	Dr. Hugo Villachico
Frutales	(vacante)	
Hortalizas	Ing. Gary Nuñez CICH, Huaral	
Leguminosas de Grano	Ing. Enrique Torres	
Maiz	Dr. Luis Narro EEA Baños del Inca	
Oleaginosas	Ing. José Morales EEA El Chira	
Papa	Ing. Antenor Hidalgo EEA Santa Ana	
Protección Integrada de Cultivos	Ing. Feliciano Avalos	Ing. José Diaz
Recursos Genéticos	Ing. Eyla Velasco	

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Programa	Nombre del Director	Nombre del Asesor
DIRECCION-GENERAL DE INVESTIGACION AGROINDUSTRIAL		
Dir.-Gen.	Quim. Teresa Cocchella	
Agricola	(vacante)	
Pecuaria	Ing. Eva Knutzen	
DIRECCION-GENERAL DE INVESTIGACION FORESTAL Y FAUNA		
Dir.-Gen.	Ing. Luis Cueto	
Productos y Transformación Forestal	Ing. Raúl Parraga	
Silvicultura y Manejo Forestal	Ing. Humberto Taxaico	
Vida Silvestre	Ing. Victor Pulido	
DIRECCION-GENERAL DE INVESTIGACION PECUARIA		
Dir.-Gen.	Dr. Hugo Tejada	
Coordinador Técnico	Dr. Juan Chavez	
Bovinos	Comité Técnico	
Camélidos	Comité Técnico	
Cuyes	Comité Técnico	
Ovinos	Comité Técnico	
Pastos y Forajes	Comité Técnico	
PROGRAMAS DE SERVICIOS ESPECIALES Y APOYO A LA INVESTIGACION		
Dir.-Gen.	Ing. Rodolfo Masuda	
Agroeconomia	Eco. Victor Chumbe	Dr. Miguel Sarria Ing. José Gil
Centro de Cómputo		Ing. Tewfick Kajat
Gestión de estaciones experimentales	Ing. Victor Torres	

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Programa	Nombre del Director	Nombre del Asesor
OFICINA DE PROGRAMACION Y PRESUPUESTO		
Dir.-Gen.	Ing. Luis Alvarado	Ing. Luis Quintanilla
OFICINA DE PROYECCION DE LA INVESTIGACION		
Dir.-Gen.	Ing. Jorge Sihuay	Ing. David Nuñez
CTTA	Ing. Raúl Graham	
Publicaciones		Ing. Américo Valdez
Semillas	Ing. Alfredo Lopez	Ing. Roger Quevedo
Servicios de Lab.	Ing. Alfredo Matos	
OFICINA DE PERSONAL		
Director	Lic. Eliana Córdova	Ing. Victor Merino Com. Dante Castro
OFICINA DE ADMINISTRACION		
Dir.-Gen.	Ing. Alberto Huby	

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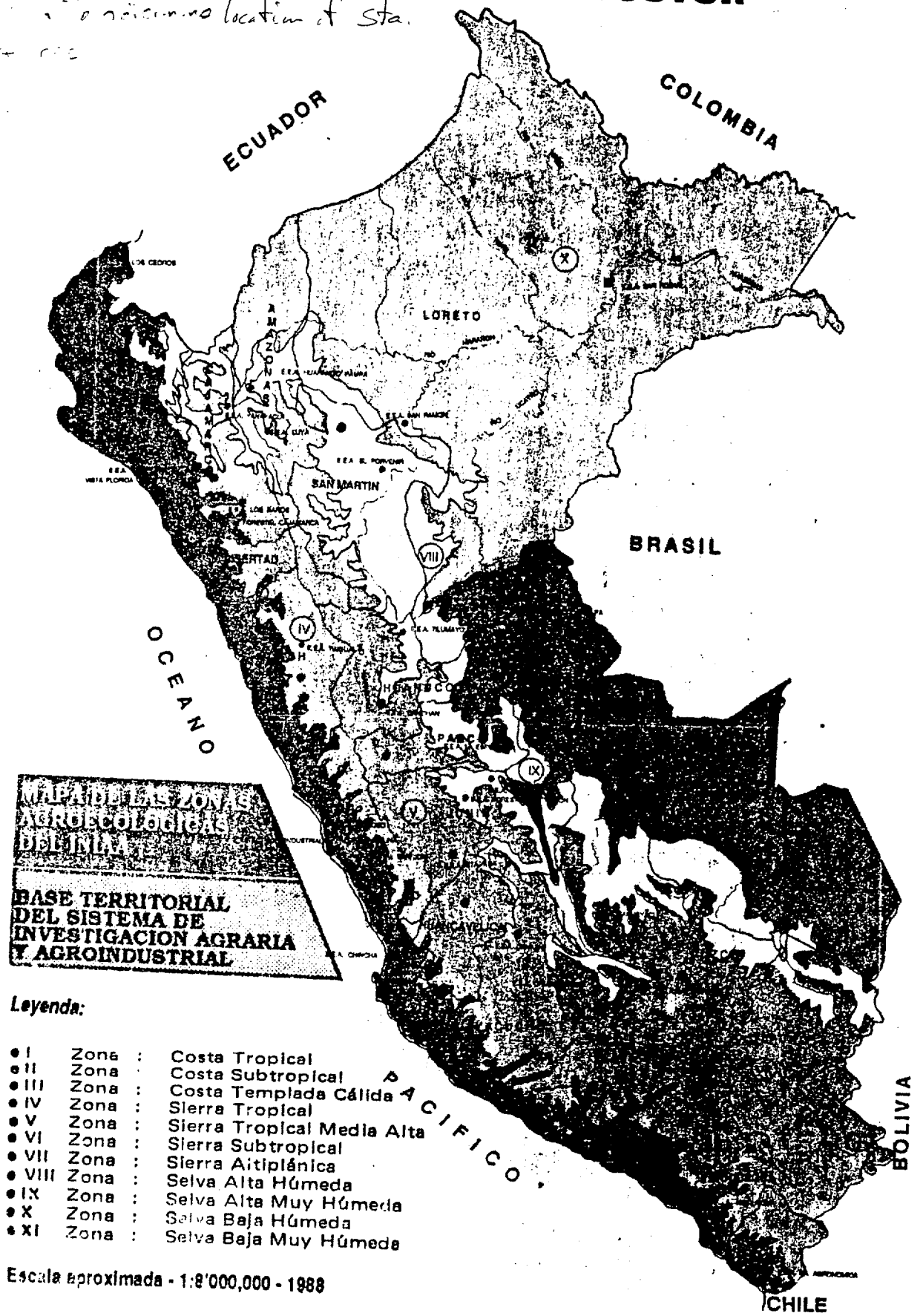
UNA RED NACIONAL DE ESTACIONES EXPERIMENTALES AL SERVICIO DEL PRODUCTOR



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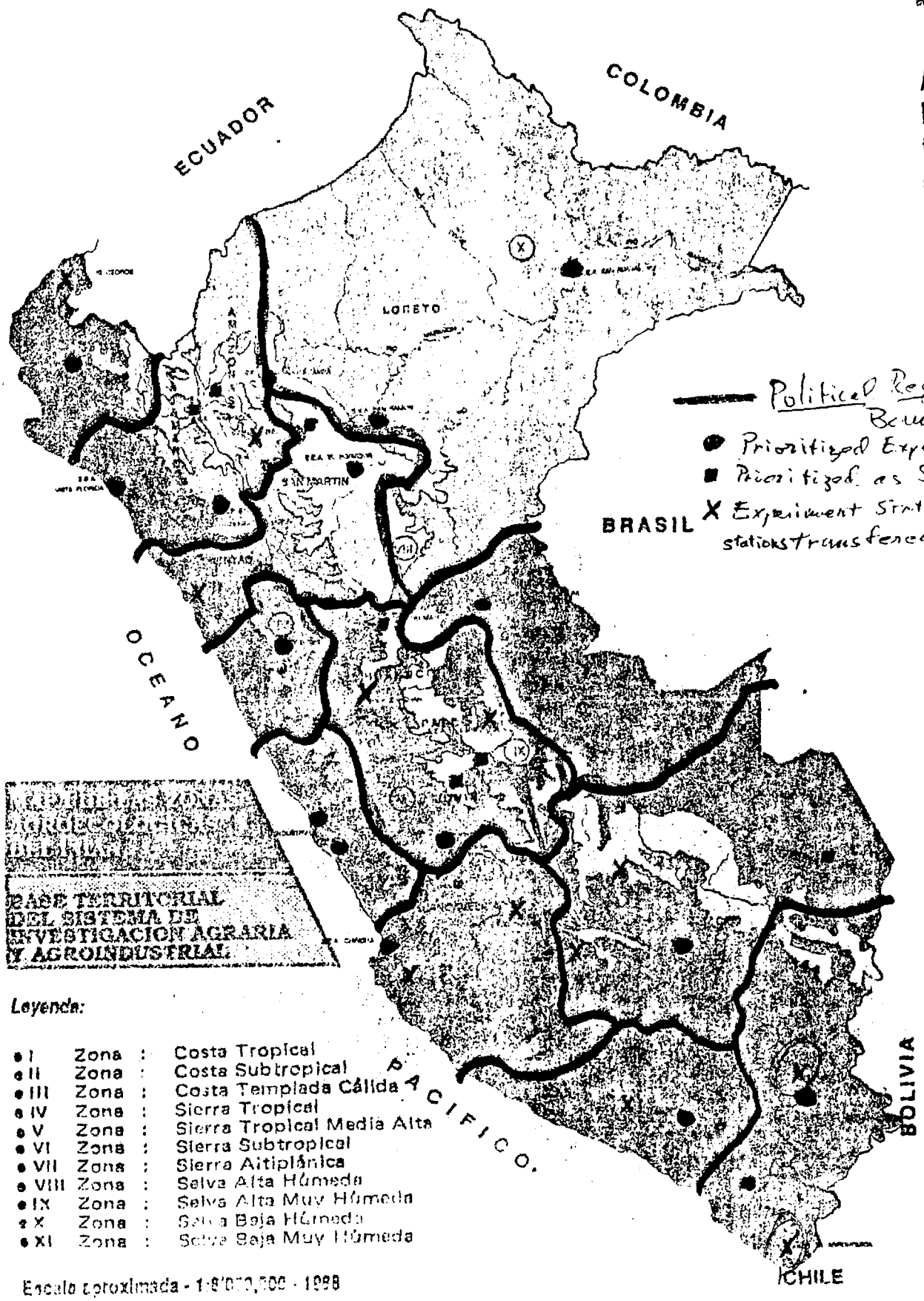
UNA RED NACIONAL DE ESTACIONES EXPERIMENTALES AL SERVICIO DEL PRODUCTOR



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LA RED DE ESTACIONES EXPERIMENTALES DEL INIAA
dentro de las Zonas Agroecológicas y Regiones Políticas

* Estaciones priorizadas para la red nacional (3-11-89)
** Priorizadas como sub-estaciones (3-11-89)
\+ A ser entregadas a las nuevas regiones políticas

I. Costa tropical

Región Grau
* El Chira - Piura
\+ Los Cedros - Tumbes

Región Nororiental del Marañon
* Vista Florida - Lambayeque

Región San Martin - La Libertad
\+ Virú

II. Costa subtropical

Región Lima
* La Molina
* Huaral

Región Los Libertadores - Wari
* Chincha
\+ Los Pobres - Ica

III. Costa templada cálida

Región Arequipa
* San Camilo (Est. Zonal) - Arequipa

Región Moquegua - Tacna - Puno
\+ La Agronómica - Tacna
** Moquegua

IV. Sierra tropical

Región Grau
\+ Huancabamba

Región Nororiental del Marañon
* Baños del Inca - Cajamarca
\+ Luya

Región Chavin
* Tingua - Huaraz
\+ Virú (Huamachuco)

V. Sierra tropical media alta

Región Andres Andino Caceres
* Santa Ana - Huancayo
+ Canchàn - Huanuco

Región Los Libertadores - Wari
+ Canaàn - Ayacucho

VI. Sierra subtropical

Región Inca
* Andenes - Cuzco
+ Chumbibamba - Andahuaylas

VII. Sierra altiplanicia

Región Mariategui
* Illpa - Puno

VIII. Selva alta húmeda

Región Nororiental del Marañon
** Yanayacu/Huarangopampa - Jaen/Bagua

Región San Martin - La Libertad
* El Porvenir - Tarapoto
** Nueva Cajamarca - Rioja

IX. Selva alta muy húmeda

Región Andres Andino Caceres

** Pichanaki
** Tulumayo (actualmente inactiva)
+ La Esperanza
** San Ramon

Región Inca
+ Sahuayacu

X. Selva baja húmeda

Región Amazonas
* San Ramon - Yurimaguas
* San Roque - Iquitos

XI. Selva baja muy húmeda

Región Inca
** Puerto Maldonado

Región Ucayali
* Pucallpa

PROGRAMAS PRIORIZADOS POR ESTACION EXPERIMENTAL.

ESTACIONES / SUB-ESTACIONES \ PROGRAMAS	ARROZ	MAIZ	PAPA	CAMOTE	LECHUGA	OLEAGINOSAS	CEREALES	FRUTAL	HORTALIZA	CULT. ANDINAS	CULT. TROPICAL	PECUARIA	MANEJO FOREST.	FLORA FAUNA	PROD. FOREST.	ACUICULTURA
1) CHIRA						S		X					X			
2) VISTA FLORIDA	S	X			X							X				
YANAYACU-HGPMA	X					X										
3) BAÑOS DEL INCA		S	X		X					X		X				
4) EL PORVENIR	X	X									X	X				
NVA. CAJAMARCA	X	X														
5) TINGUA							X						X			
6) HUARAL				S					S							
7) LA MOLINA												S				S
8) CHINCHA				X	S			X								
9) SANT. ANA			S							X		X	X			
PICHANAKI											X					
TULUMAYO																
Ax F. SN. RAMON													X			
10) ANDENES		X	X		X		S			X			X			
PRTO. MALDONADO											X					
11) SAN CAMILO							X		X			S	X			
12) ILLPA			X				X			S		S				
MOQUEGUA								X								
13) SAN ROQUE					X						S					
14) PUCALLPA						X					X	X	S	X	X	
15) SAN RAMON	X										X					

S = ESPECIALIDAD

X = [illegible]

INDICADORES DEL ESTADO DE MADUREZ DE UN PROGRAMA DE INVESTIGACION

En setiembre de 1988 se introdujo al INIAA, el concepto de "madurez" de sus Programas de Investigación. Entendemos por "madurez," un estado de autosuficiencia en el sentido de que los usuarios de la tecnología generada están tan satisfechos con el producto, que ellos mismos toman las medidas necesarias para garantizar el apoyo económico que el Programa necesita, un apoyo que puede ser directo, atraves de las Asociaciones de Productores, o indirecto, através del sistema político.

Los indicadores del estado de "madurez" de un Programa de Investigación son:

- una adecuada metodología de diagnóstico de los problemas tecnológicos de los productores;
- un adecuado sistema de priorización, planificación, implementación, supervisión y evaluación de los proyectos de investigación;
- vínculos activos con la comunidad universitaria y científica, tanto nacional como internacional;
- un adecuado sistema de comprobación técnica y validación económica de las nuevas tecnologías;
- vínculos activos con los usuarios de la tecnología generada por el Programa, que facilita el diagnóstico dinámico de problemas, la transferencia oportuna de nueva tecnología y la retroalimentación;
- un flujo de publicaciones y otras formas de comunicación dirigidas a las varias comunidades de usuarios; y
- un adecuado sistema de retroalimentación para conocer los resultados de la aplicación de nuevas tecnologías.

También en setiembre de 1988 se realizó una encuesta a los respectivos Directores de Investigación, pidiendo una autoevaluación del grado de "madurez" logrado por el Programa bajo su cargo.

Ahora, en medio camino del Proyecto TTA, se ha visto la conveniencia de repetir el proceso de autoevaluación por parte de los Directores de los Programas de Investigación, con los fines de:

1. Servir como punto de referencia para los dirigentes del INIAA, para la evaluación del progreso registrado por los PP.II. en el período que corresponde al año calendario 1989.

2. Servir como base de información para una evaluación externa del Proyecto TTA (Junio 1990).

3. Señalar los puntos más débiles de la marcha de los PP.II., que serían objetos de atención especial durante los meses que vienen.

Madurez de los
Programas de Investigación y Apoyo a la Investigación del INIAA

Programa	Puntaje	Madurez	Autoevaluación: Progreso 1988-89	Autoevaluación: Comparación Años previos	Autoevaluación: Comparación Otros progr.
Agua y Suelos	10	1			-
Arroz	50	3	p	-	+
Cereales	42	3	p	-	=
Cultivos Andinos	59	4	m	+	=
Cultivos Tropicales	56	4	m	+	+
Hortalizas	47	3	r	+	
Leguminosas de Grano	67	4	m	+	=
Oleaginosas	65	4	r	+	=
Papa	69	4	r	+	+
Protección Integrada de Cultivos	60	4	r		=
Agroind. Agricola	12	1	p		-
Agroind. Pecuaria	16	1	p		+
Productos y Transf. Forestal	26	2	p		
Silvicultura y Manejo Forestal	44	3			=
Vida Silvestre	34	2	r	-	=
Camélidos/Ovinos	40	3	r		-
Crianzas Familiares	58	4	m		+
Pastos y Forajes	58	4	m		+

Explicación:

Puntaje - Rango 0 (deficiente) á 102 (ideal)

Madurez - Rango 1 (inmaduro) á 5 (maduro)

Progreso 1988-89 -
- m = mucho
- r = regular
- p = poco

Progreso 1988-89 comparado con años previos -
- + = mayor
- = = igual
- - = menor

Madurez comparado con otros programas del INIAA -
- + = entre los más maduros
- = = entre el promedio
- - = entre los menos maduros

FUNCION Y CONFORMACION DE LOS COMITES DE ASESORAMIENTO TECNICO

Se formará un comité de asesoramiento técnico para ciertos Programas de Investigación del INIAA.

Los comités estarán conformados por especialistas (4-6) de alto nivel, de adentro o de afuera del INIAA, agrupados en forma multidisciplinaria para apoyar al Director-General en la dirección técnica del programa de investigación.

Las funciones de cada comité son las siguientes:

1. Participar en la definición de políticas, metas, y estrategias del programa de investigación que les corresponde.

2. Asesorar al DGIA en la revisión anual del Plan Operativo (selección de proyectos de investigación; priorización de las EE.EE.) del INIAA, en lo que se refiere al Programa que les compete.

3. Mantener vínculos activos con los productores, através de sus asociaciones, para asi facilitar el diagnóstico dinámico de los problemas técnicos que necesitan atención.

4. Proponer nuevos proyectos de investigación y ayudar en la buscada de financimiento para ellos.

5. Proponer acciones de transferencia de tecnología.

6. Proponer acciones de capacitación del personal técnico del Programa en las EE.EE.AA.

7. Facilitar y agilizar los vínculos entre el INIAA y otras entidades que realizan investigación en el Perú y/o relevante para el Perú. Proponer y facilitar proyectos colaborativos.

Cada comité se reunirá con la frecuencia necesaria para cumplir con su función.

Los miembros de los comités técnicos son:

- El Director y el Asesor (si hubiera) del Programa.
- Especialistas de disciplinas según las necesidades para cada Programa.
- Representantes de Programas de Investigación del INIAA o de alguna(s) universidad(es).
- Representantes de los principales usuarios de la tecnología generada por el Programa.
- Representantes de las entidades de apoyo, de afuera o de adentro del INIAA.

Para cada miembro de un comité se formulará un contrato de servicio que servirá como base para la evaluación de sus logros.

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APPENDIX C

GUIDELINES FOR THE EVALUATION OF RESEARCH PROPOSALS

NORMAS PARA EL FUNCIONAMIENTO DEL GRUPO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

NORMAS PARA EL FUNCIONAMIENTO DEL GRUPO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

1. NATURALEZA Y ALCANCES DEL GRUPO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

El Grupo de Evaluación de Propuestas de Investigación (GREPI), es un conjunto de investigadores científicos y profesionales de elevada capacidad y amplia experiencia en los campos de la actividad agraria y científica de su competencia, que constituye el eje de un mecanismo que tiene por objeto específico evaluar los proyectos de investigación que han sido presentados a FUNDEAGRO, seleccionando aquellos con calificación suficiente para ser financiados con fondos de donación competitiva del Proyecto T.T.A.

Los proyectos de investigación seleccionados para financiamiento por el GREPI tienen carácter de aprobados, debiendo seguir el curso administrativo diseñado por FUNDEAGRO para tal fin.

2. CONSTITUCION DEL GRUPO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

El GREPI está constituído por cuatro representantes de la comunidad científica y, además por un representante de la A.I.D., un representante de la Misión Agrícola de la Universidad de Carolina del Norte, y un representante de FUNDEAGRO. Estos tres últimos conforman el GRUPO BASE.

El GREPI eligirá un Coordinador, el cual cumplirá sus funciones por un año, pudiendo ser reelegido. El representante de FUNDEAGRO actuará como Secretario.

3. FUNCIONES Y ATRIBUCIONES DEL GRUPO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

Son funciones y atribuciones del GREPI:

a) Aprobar el procedimiento de evaluación y selección de propuestas de investigación.

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b) Evaluar, seleccionar y priorizar las propuestas de investigación presentadas a FUNDEAGRO solicitando financiamiento con fondos del Proyecto T.T.A.

c) Elaborar el Acta sobre los resultados del proceso de evaluación y selección de propuestas.

d) Aprobar las normas para el funcionamiento del Grupo.

4. FUNCIONES DE LOS MIEMBROS DEL GRUPO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

Del COORDINADOR del GREPI:

a) Presidir las reuniones del Grupo.

b) Informar a los miembros sobre asuntos relativos al funcionamiento del Grupo.

c) Disponer las citaciones a las reuniones del Grupo.

d) Disponer con el Secretario el trámite de las Actas de las reuniones.

e) En caso de ausencia, delegará su función en uno de los miembros del Grupo.

De los MIEMBROS del GREPI:

a) Evaluar las propuestas de investigación.

b) Mantener actualizada la metodología de evaluación de proyectos.

Del SECRETARIO del GREPI:

a) Remitir las propuestas de investigación a los miembros del Grupo para su evaluación, y recibir sus opiniones antes de las reuniones.

b) Preparar y remitir las citaciones a las reuniones del Grupo, en acuerdo con el Coordinador.

c) Redactar las Actas de las reuniones del Grupo.

d) Disponer el trámite de las Actas, en acuerdo con el Coordinador.

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e) Informar al GREPI sobre los asuntos relevantes al cumplimiento de su función.

Del GRUPO BASE del GREPI:

a) El Grupo Base está encargado de la revisión preliminar de las propuestas de investigación remitidas a FUNDEAGRO, con el fin de establecer si ellas se ajustan a criterios previamente establecidos por el Grupo. Sus acuerdos serán registrados en un Acta y sometidos a la consideración del GREPI al inicio de la sesión correspondiente.

5. REUNIONES DEL GRUPO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

El GREPI tendrá reuniones ordinarias cuatro veces al año, en Marzo, Junio, Setiembre y Diciembre. Podrán realizarse reuniones extraordinarias, dependiendo de la necesidad que exista.

La c..ación a una reunión se hará por lo menos con 8 días de anticipación y se efectuará mediante citación personal en el domicilio o centro de trabajo de los miembros.

Las citaciones serán cursadas por el Secretario señalando lo siguiente:

a) Lugar, fecha y hora que se realizará la reunión.
b) Agenda a desarrollar.
c) Fecha de la citación.

La reunión podrá iniciarse si a la hora indicada en la citación están presentes un número de miembros del Grupo, incluído el Coordinador, que sea superior a la mitad de éstos.

Para cada reunión del Grupo se elaborará un Acta que será firmada por todos los miembros presentes. El Acta básicamente debe contener lo siguiente:

a) Proyectos aprobados: características y observaciones generales.
b) Proyectos aprobados con modificación: características y observaciones generales.

c) Proyectos a ser devueltos para reestructuración: características y observaciones generales.

d) Proyectos no aprobados.

6. PROCEDIMIENTO PARA EVALUACION Y SELECCION DE PROPUESTAS DE INVESTIGACION (VER DIAGRAMAS ADJUNTOS)

El procedimiento general a seguir para la evaluación y selección de las propuestas de investigación constará de los pasos siguientes:

PRIMERO: Evaluación Preliminar: Los miembros del Grupo Base determinan si los proyectos presentados se ajustan a criterios cualitativos establecidos por FUNDEAGRO y el GREPI.
Ver diagrama Proceso I.

SEGUNDO: Evaluación, priorización y selección de las Propuestas: Empleando una técnica previamente acordada.(1) El Grupo determina los proyectos aprobados para financiamiento. Los proyectos restantes corresponden a aquellos que son aprobados pero con modificaciones, devueltos para ser reestructurados y propuestas no aprobadas. Ver Diagrama Proceso II.

A fin de alcanzar concenso en sus acuerdos, el GREPI puede solicitar la opinión de otros miembros de la comunidad científica nacional o internacional de reconocido prestigio en el campo de que trate un determinado proyecto de investigación.

---

(1) En el anexo se presenta un método de clasificación de perfiles de proyectos de investigación para evaluación y selección de los mismos. Dicho método es simple y no requiere de mucho papeleo.
A cada uno de los miembros del GREPI, en la evaluación individual de cada uno de los proyectos, este método podrá servirles de ayuda.

DIAGRAMA DEL PROCESO GLOBAL DE EVALUACION
PARA SELECCION DE PROPUESTAS DE INVESTIGACION

PROCESO I

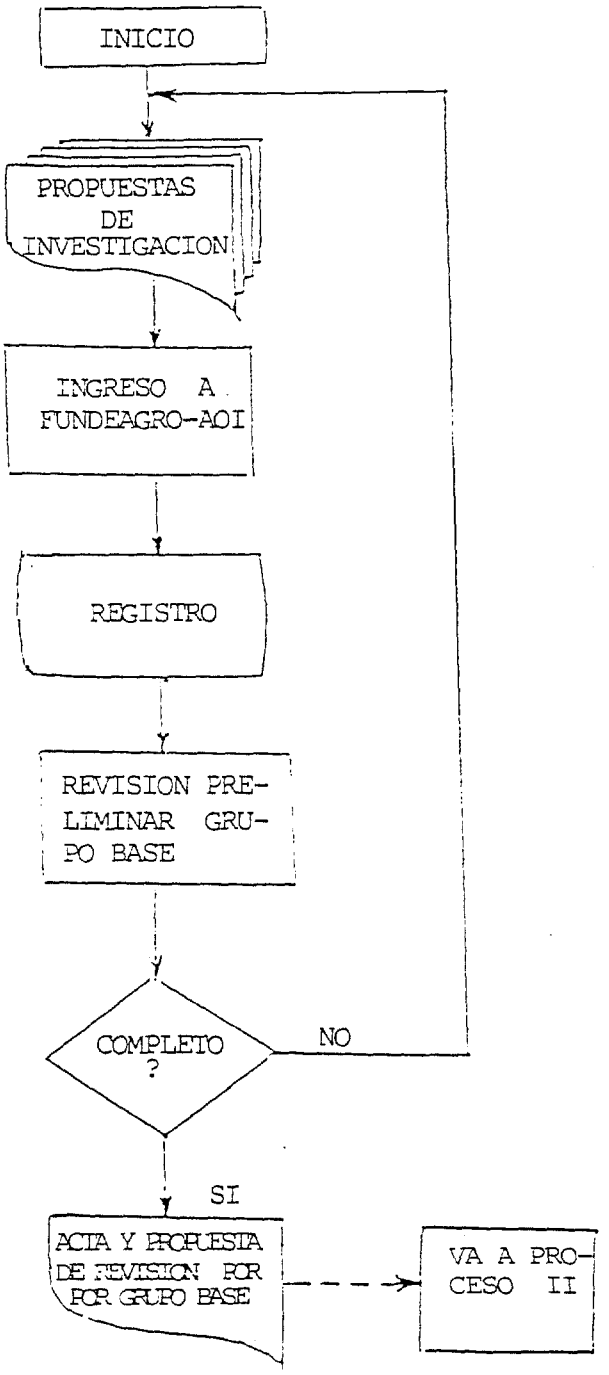
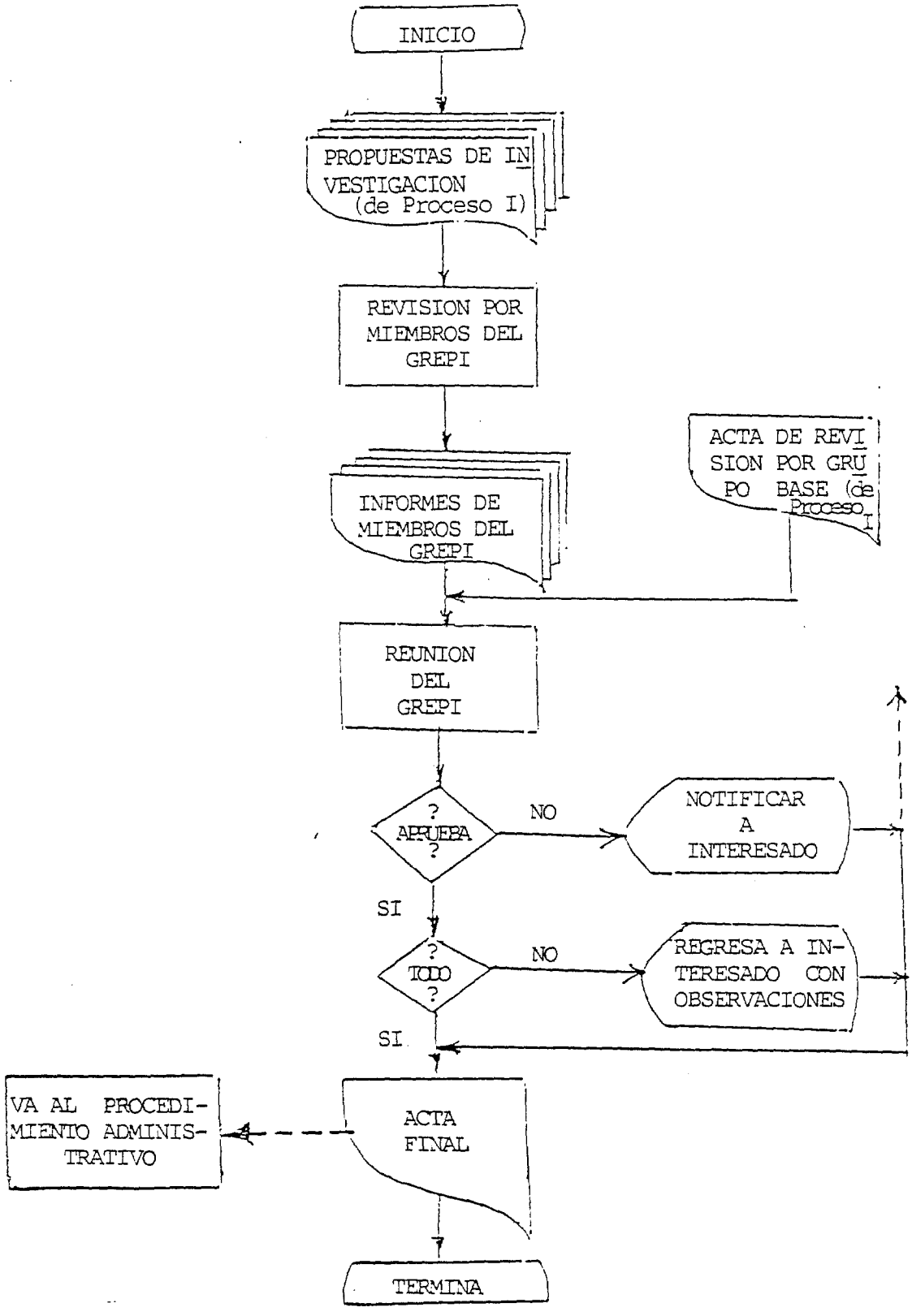


DIAGRAMA DEL PROCESO GLOBAL DE EVALUACION
PARA SELECCION DE PROPUESTAS DE INVESTIGACION

PROCESO II



A N E X O

METODO DE CLASIFICACION DE PERFILES DE PROYECTOS DE INVESTIGACION

A N E X O

EL METODO DE CLASIFICACION DE PERFILES DE PROYECTOS DE INVESTIGACION PARA LA EVALUACION Y SELECCION DE PROYECTOS (1)

1. FUNDAMENTO

El método de clasificación de perfiles de proyectos de investigación consiste en clasificar estos de acuerdo a una relación de criterios, cada uno de los cuales recibe una puntuación que va de 1 a 5, según se considere excelente, muy bueno, bueno, regular o deficiente cada uno de los criterios. Estos criterios han sido seleccionados en relación con los objetivos que se persiguen alcanzar por la institución que asigna los fondos para las investigaciones. El método es muy simple y no requiere mucho papeleo.

2. PROCEDIMIENTO

a) Cada uno de los miembros del Grupo usará el Cuadro No. 1 para obtener el puntaje de cada proyecto.

b) Los puntajes obtenidos para cada uno de los proyectos se anotan en el Cuadro No. 2, de modo que sus promedios figuren en orden decreciente.

c) El procedimiento de selección termina con la identificación de aquellos proyectos que serán financiados en función del orden de mérito que ocupan en el cuadro de clasificación, y el monto de fondos disponible.

NOTA

Este método, o cualquier otro, resultará más efectivo si previo a la reunión, el Grupo solicita por intermedio del Secretario opinión de expertos sobre proyectos que estime conveniente, en relación a mérito científico.

Adaptado de Arnon, I. 1975. Planificación y Programación de Investigaciones Agronómicas. FAO, Roma.

DEFINICION DE CRITERIOS

A. MERITO CIENTIFICO

Se refiere a un conjunto de indicadores que determinan la calidad científica del proyecto presentado.

1. Importancia del problema: Concierne a la urgencia que se tiene por encontrar soluciones al problema en estudio, la magnitud del mismo en cuanto al número de agricultores que se beneficiarían y/o la expansión del área que tiene el problema en cuestión.

2. Grado de coherencia de los objetivos con el problema: Se refiere al nivel de relación que existe entre el problema cuya solución se busca y los resultados que se esperan obtener del estudio.

3. Claridad en la formulación de la (s) hipótesis: Se refiere a la precisión y claridad con que es formulado el enunciado, la base científica en que descansa, y la consistencia de las variables a relacionar en cuanto alternativa de solución o respuesta explicativa o predictiva concerniente al problema.

4. Originalidad de la investigación: Se refiere a la novedad del enfoque o modo de atacar un problema investigatorio, sobre todo si está acompañado de un metodología adecuada y actualizada.

5. Amplitud de la revisión de literatura: Concierne a la cobertura de la literatura revisada en relación al estado del conocimiento actual sobre el tema de investigación.

6. Grado de adecuación de la metodología con los objetivos y la (s) hipótesis: Consiste en apreciar si la metodología propuesta, en sus diversos aspectos, es consistente con los resultados esperados, llegando a conclusiones que tengan un nivel satisfactorio de certidumbre.

7. Idoneidad profesional: Se evalúa la experiencia profesional del investigador principal en relación al tema de investigación (Curriculum Vitae).

B. ASPECTOS ECONOMICOS

Con estos indicadores se aprecian tres aspectos económicos del proyecto de investigación.

8. Grado en que los estimados de costos son realistas: Se explica por si mismo.

9. Grado de participación económica del sector privado: Se refiere a la proporción del costo total que es cubierta por el sector privado:

Mayor del 70%	5 puntos
70 -50%	4 puntos
50 -30%	3 puntos
30 -10%	2 puntos
Menos de 10%	1 punto

10. Disponibilidad de medios para la investigación: Se refiere a recursos adicionales que tendrían que obtenerse a fin de poder llevar a cabo la investigación (equipos, contratación de investigadores, construcción de instalaciones, etc.).

C. COORDINACION

Se evalúa la medida en que los autores del proyecto de investigación - han interactuado con investigadores de otras instituciones.

11. Evidencia de coordinación con otras instituciones: Se explica por si mismo.

D. POTENCIAL DE LA INVESTIGACION PARA RESOLVER PROBLEMAS PRACTICOS

12. Nivel de probabilidad de éxito: Concierne a las posibilidades de lograr satisfactoriamente los objetivos dentro del plazo de duración del proyecto.

13. Grado de dificultad para convertir los resultados en prácticas a ser adoptadas por los agricultores: Se explica por si mismo.

CUADRO DE EVALUACION DE PROPUESTAS DE INVESTIGACION

Título del Proyecto.....

.....

Fecha de evalaución..... Evaluado por .....

CRITERIOS (*)	Excel. (5)	M.Bueno (4)	Bueno (3)	Regul. (2)	Defic. (1)
A. MERITO CIENTIFICO					
1. Importancia del problema					
2. Grado de coherencia de los objetivos del problema.					
3. Claridad en la formulación de la (s) hipótesis.					
4. Originalidad de la investigación.					
5. Amplitud de la revisión de literatura.					
6. Grado de adecuación de la metodología con los objetivos y la (s) hipótesis.					
7. Idoneidad profesional.					
B. ASPECTOS ECONOMICOS					
8. Grado en que los estimados de costos son realistas.					
9. Grado de participación económica del sector privado.					
10. Disponibilidad de medios para la investigación.					
C. COORDINACION					
11. Evidencia de coordinación con otras instituciones.					
D. POTENCIAL DE LA INVESTIGACION PARA RESOLVER PROBLEMAS PRACTICOS					
12. Nivel de probabilidad de éxito.					
13. Grado de dificultad para convertir los resultados en prácticas a ser adoptadas por agricultores.					

PUNTAJE TOTAL_____

(*) Ver definición de criterios en pgs. siguientes.

El Proyecto debe ser:
1. Aprobado
2. Aprob. con modific.
3. Devuelto para reestruc.
4. No aprobado

RECOMENDACIONES SOBRE MODIFICACIONES .....

.....

.....

CUADRO No. 2

CUADRO RESUMEN E PUNTAJES Y ORDEN DE MERITO DE

PROYECTOS DE INVESTIGACION

Fecha de evaluación .....Evaluadores.....Código.....

....

Monto disponible para ....
financiar investigación

....

....

I/. ....

....

No. del Proyect.	Título del Proyecto	Solicitante	Puntaje Evaluado				Pro-me-dio	Monto soli-citado I/.	Aporte Adicional I/.
			1	2	3	etc.			

APPENDIX D

FUNDEAGRO AGRICULTURAL RESEARCH PROJECTS

PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned (to 3/31/90)	MAGNITUDES Achieved (to 3/31/90)
3. Flow of improved technology sufficient to elicit tangible support from client groups. Targets:				
-new varieties	55	-new varieties	9	10
-basic seed	50m MT	-basic seed	3.8m MT	1.1m MT
-veg. seedl.	500m	-veg. seedlings	325m	325m
-in vitro propagules, tubers & fruits (no. of crops)	7	-in vitro propagules, tubers & fruits (no. of crops)	7	7
-virus-free var.	2	-virus-free var.	2	2
-improved agronomic practices	300	-improved agronomic practices	100	101
-improved an. husbandry practices	15	-improved an. husbandry practices	4	6
-technology transfer events	250	-technology transfer events	60	54
-publications	500	-publications	60	45
4. Active linkages of RP's with:		11. Linkages have been initiated, reactivated or maintained with:		
-Peruvian universities	80	-Peruvian universities	37	59
-CGIAR centers	20	-CGIAR centers	16	19
-Foreign univ.	40	-Foreign univ.	12	15
-Regional networks	30	-Regional networks	12	30
-Producer associations	50	-Producer associations	16	26
-Technical assistance services	30	-Technical assistance services	8	11
-Techn. gen. & transfer system in new political regions	11	12. Techn. adv. comm. for RP's installed, with univ. partic.	10	3
		13. Linkages with new political regions:		
		-framework conceptualized		
		-preliminary contacts in Grau & Inca	2	2

PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned (to 3/31/90)	MAGNITUDES Achieved (to 3/31/90)
5. R/RSP's will be sufficiently mature (self-sustainable) to be assured of adequate political and budget support to sustain level of effort at end of project:		14. The "maturity" concept for R/RSP's is increasingly accepted by INIAA leaders as a practical framework for setting Program goals and measuring progress. Positive maturity indices registered for several R/RSP's: -updated problem diagnosis and feedback studies -relevant, effective, priority research -linkages with scientific community and users -continual validation of new technology -publications & techn. transfer -new funding sources		
-Mature RP's	18			
-Mature RSP's	5			
		15. National mtgs of R/RSP and/or Exp. Sta. Directors	3	3

ACTIVITY 1b. Strengthening the Adminstration and Management of INIAA's R/RSP's (Implementing Institution: INIAA)

1. Annual meetings of R/RSP's	50	1. Annual meetings have been held. -RP's	26	17
		2. Projected 4-yr plan for bi-annual mtgs developed.		
2. Evaluation mechanisms perfected and utilized -technical: internal external -management -impact		3. Guidelines approved for internal technical evaluat. by R/RSP Dir.		
		4. Techn. eval. now routine at all exp. sta. by R/RSP Dir. & Adv.		
		5. External technical evaluations	4	4
		6. Exp. Sta. management evaluation	1	1
		7. Simplified & more effective reporting system implemented.		

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PROJECT OUTPUTS	MAGNITUDE PLANNED	CUMULATIVE ACCOMPLISHMENTS	MAGNITUDES Planned (to 3/31/90)	Achieved
3. Improved mechanisms for research planning		8. Research planning has been conducted by several modes:		
		-R/RSP Dir. meet w/ Exp. Dir. (OPP conference)	1	1
		-roundtable of distinguished leaders	1	1
		-regional planning conf.	1	1
		-commodity workshop	1	1
		-discipline-oriented workshops	2	2
		-natl. planning commis.	1	1
		-regl. planning commis.	1	1
		-perm. techn. adv. comm.	10	5
		-technical analysis (techn. gaps)	1	1
4. Research design, biometry, & computational advisory service to RP's & exp. stns. will be operational.		9. Concept of advisory committee for biometry & comput. service developed.	1	1
5. Improved personnel evaluation system will be implemented.		10. Internal study of personnel eval. criteria was initiated.	1	1
6. Career development and incentives		11. In-service trng. for personnel of R/RSP's in several exp. stns.		
-in-service training		12. Shortterm training in neighbor countries.	26	30
-shortterm training, abroad (no. of trainees)	150	13. Publication incentive bonuses.		
-shortterm training, in-country (no. of events) (**)	100	14. Prof. soc. mtgs.	5	2
-post graduate study				
-publication incentives				
-improved salaries				
-participate in professional societies (no. of mtgs.)	20			

FUNDEAGRO

FUNDACION PARA EL DESARROLLO DEL AGRO

==========

PROYECTO TRANSFORMACION DE LA TECNOLOGIA AGROPECUARIA

AUMENTO DE OPORTUNIDADES DE INVESTIGACION

RELACION DE PROYECTOS DE INVESTIGACION AGRARIA

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*Finalized = F
(in review)

RELACION DE PROYECTOS DE INVESTIGACION AGRARIA

F 1. Evaluación comparativa y estudios genéticos de 2 líneas de algodón pima resistentes a "Marchitez" causada por *Fusarium oxysporum f. sp. vasinfectum* en los valles de Chira y Piura.
Dr. Martín Delgado Jurado — UNP

(*) 2. Efecto de la nutrición sobre el desarrollo fetal y la sobrevivencia de la cría de alpaca.
Dr. Julio Sumar Salinas — INIA La Raya

Finalized 3. Evaluación de almacenes de arroz bajo el sistema "UNPRG".*
Dr. Cesar M. Ventura Flores — UNPRG

F 4. Evaluación de las poblaciones del piojo peruano (*Anthonomus vestitus*) en 2 hospederos de reproducción y alimentación durante la fase de campo limpio del algodonero.
Ing. Julio Villarreal F. — UNP

F 5. Aislamiento y evaluación de hongos, bacterias y actynomycetes de suelos algodoneros de Piura en su acción fitopatogenica a *Macrophomina phaseolina* (Tassi) GOID. agente causal de la podridión carbonosa de la raiz.
Ing. Javier Javier Alva — UNP

6. Determinación de la edad óptima para transplante de espárrago (*Asparragus officinalis* L.) en el departamento de Lambayeque y La Libertad.
Ing. Francisco Regalado Diaz — UNPRG

7. Efecto de las aplicaciones del cloruro Mepiquat y momentos de descunte en la fisiología y rendimiento del algodón (G. *Hirsutum* L.) cultivar "Del Cerro".
Ing. Miguel A. Jimenez G. — UNPRG

8. Evaluación y selección de líneas y/o cultivares de frijol de palo (*Cajanus cajan* (L) Millsp). y sus posibilidades de industrialización
Ing. César F. Morante R. — UNPRG

F 9. La lombriz de tierra (*Lumbricus* sp.) como suplemento proteico en la alimentación animal y productora de humus a partir de materia orgánica.
Ing. Luis Aliaga Rodriguez — UNC del Peru

(*) Convenio resuelto.

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10. Estudio de la dinámica y funcionamiento de los mercados de trabajo rural en el departamento de Piura
Eco. Fernando Vásquez Pacheco UNP

11. Estudio de la biología del Gorgojo [illegible] (Monomorium hemipterus L.) del cultivo del plátano en Tumbes.
Ing. Pedro S. Castillo Carrillo UNT
Br. Milton Valladolid Ramos

12. Vacunación: Un tratamiento para la [illegible]
Dr. Armando González UNPRG

13. Ensayo de métodos para manejo y aprovechamiento [illegible] Cuero en Racali, Departamento de Lambayeque.
Ing. Carlos Zamora M. UNPRG

14. Evaluación [illegible] control ambiental por precocidad en una variedad de [illegible] cultivado en Costa Norte.
Ing. Gilberto [illegible] Santa Cruz UNPRG

15. Estimación del monto de daños producidos por la enfermedad hoja blanca en áreas representativas del valle de Tumbes y determinación de la fluctuación poblacional del insecto vector (Sogatodes orizicola)
Ing. Miguel Barrios R.
Br. Dominoo Luis Tandazo Rios UNT

16. Utilización del hongo Paecilomyces lilacinus en el control de nemátodes en cultivos hortícolas y frutícolas en Piura.
Ing. Oscar Macías Varleque UNP

17. Uso del cultivo de anteras y células somáticas como alternativa en la obtención de variedades de arroz (Oryza sativa L.)
Dr. Cesar Ventura Flores UNPRG

18. Analisis de la oferta de exportacion no tradicional. Caso: Estudio: El Mango Peruano.
Eco. Elías S. Castillo Córdova UNP

19. Fertilización nitrogenada fosfórica en el cultivo de espárrago en el departamento de La Libertad.
Ing. Julio A. Oliva P. UNPRG

20. Efecto de las aplicación de estiércoles al suelo en la eficiencia biocontroladora del hongo Paecilomyces lilacinus sobre el nemátode del nudo de la raíz (Meloidogyne incógnita). Ing. Jorge Llontop Llaque UNPRG

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21. Dinámica poblacional de insectos plagas e insectos benéficos en cucurbitáceas (zapallo, melón, sandía) especialmente *Diaphania nitidalis* y *D. hyalinata* en el valle de Cañete.
Ing. Silvestre Lizama — EAP. Agr. Cañete

22. Evaluación de germoplasma para resistencia a enfermedades virósicas en maíz.
Ing. Ricardo Sevilla Panizo — UNALM
Ing. Walter Salvador M.

23. Densidad de semilla para siembra directa en suelo seco de tres variedades de arroz en la zona del Bajo Mayo departamento de San Martín
Ing. Manuel Rojas Tasilla
Ing. Agustín Cerna Mendoza — UNSM-Tarapoto

24. Selección de cultivares de papas nativas tetraploides para progenitores con alta aptitud combinatoria.
Ing. Gustavo Javier Torres — UNC del Perú

25. Selección de clones F1 de cruzas dialélicas y polinización libre en papas nativas.
Ing. Gustavo Javier Torres — UNC del Perú

26. Potencial de la fijación biológica del N con simbiontes nativos asociados en las leguminosas arbóreas de la Costa Norte Peruana.
Ing. Patricia A. Moreno — UNALM

27. Niveles tecnológicos en la producción de papa y adopción de prácticas agrícolas por agricultores de comunidades del departamento de Puno.
Dr. Hugo Veda Cadima
Ing. Eufracio Condori M. — UNAP

28. Evaluación de la distribución y situación actual de las poblaciones del género *Polylepis* en los departamentos de Ancash y Lima.
Ing. Francisco Tovar — UNAP
Ing. Rodrigo Arce

29. Investigaciones en riego por goteo sus bases y sus interacciones con labores culturales en el Bajo Tambo.
Ing. Juan Lazo A. — UNALM

30. Evaluación de cepas de *Rhizobium leguminosarum* biovar *phaseoli*
Dra. Nelly Ramírez de Jiménez — UNAP

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31. Caracterizacion del potencial de fertilidad natural de los suelos aluviales de la zona de Iquitos (ríos Nanay e Itaya)
Dr. Pedro G. Paredes UNAP

32. Evaluación de factores de erosión [illegible] de [illegible] conservación de suelos en la microcuenca [illegible]
Dra. Carmen Felicia Morales de Marín UNALM
Ing. Daniel Zamata Manani

Final 33. Efecto de las condiciones climáticas [illegible] sobre las características físicas, químicas y microbiológicas de [illegible] Clima Subtropical [illegible] Cuenca.
Ing. Martín Silva Jaime UNALM
Bach. Manuel [illegible]

34. Evaluación [illegible] del [illegible]
Dra. Teresa [illegible] UNALM

35. Cambios en la producción y productividad agrícola en la Costa Sierra del Perú debido a factores climatológicos y no relacionados con [illegible] Análisis para 1964-1987 ???
Ing. Adolfo [illegible]
Ecc. Pablo P. [illegible] UNALM

36. Toma de decisiones relacionadas con la actividad agropecuaria bajo dos modalidades de tenencia. Sellos
Ing. Aníbal [illegible] UNALM
Br. [illegible] Paredes

37. Niveles de uso de agroquímicos agrícolas: Drenaje de escurrimiento superficial en [illegible] cerros curvos.
M.V. Marina A. Sober A. UNALM

38. Evaluación de resistencia al nematodo del quiste (Globodera pallida Stone) en cuatro variedades de papa
Ing. Delia Gamarra G. UNC del Perú

39. Ocurrencia estacional de "gusano rosado" (Pectinophora gossypiella), "gusano mediador" (Anomis sejana), "barrenador grande de la bellota" (Heliothis virescens), picudo peruano (Anthonomus vestitus) y sus enemigos naturales en el valle de Cañete.
Ing. Guillermo Sánchez UNALM
Br. Carlos Sordomez H.

40. Rendimiento y adaptabilidad de 16 híbridos de girasol acelgero en tres localidades de la Costa Central.
Ing. Luis Chiappe V. UNALM
Br. Ian Grodman H.

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41. Utilización de maíz criollo en varias [illegible]
Ing. Cristobal Díaz Guerra [illegible]

42. Inducción de celos fértiles en [illegible]
Ing. José M. Cadillo C. [illegible]

43. Determinación del valor [illegible] forrajeros de los [illegible]
Ing. [illegible] Zevallos T. [illegible]

44. [illegible]
[illegible]

45. [illegible]
[illegible]

46. [illegible] Jingiber officinale
[illegible]

47. [illegible] en ambientes de Selva Central
[illegible]

48. Factores que influyen en la incidencia de [illegible] en el cultivo de [illegible] en 3 comunidades del [illegible]
Dr. Pedro [illegible]
[illegible]

49. [illegible] de tecnología para [illegible]
Ing. Irene Flores R. [illegible]

50. Diagnóstico de deficiencia de [illegible] en vid y su corrección.
Dra. Juana A. Huallanca C. [illegible]

51. Diagnóstico de exceso y toxicidad de B. [illegible] manejo.
Dra. Juana A. Huallanca C. [illegible]

52. Serodiagnosis: Una nueva arma de lucha contra la tuberculosis bovina.
M.V. Alfredo Delgado C. [illegible]

53. Uso de Lemnacea en la alimentación de ganado vacuno.
Biólo. Ana R. Haussbin [illegible]

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54. Importancia de la [illegible] en la producción de alcachofa.
M.V. Guillermo M. [illegible] [illegible]

55. Estudio comparativo [illegible] en áreas de [illegible].
M.V. Dominoo [illegible] [illegible]

56. Calibración [illegible]
[illegible]

57. [illegible] INIA

58. [illegible] de Solsina blanca [illegible] de madera.
[illegible] ICE

59. [illegible] áreas [illegible] Lima [illegible] con [illegible]
[illegible] UNC del Perú

60. [illegible] de [illegible] (Solanum [illegible]
Dr. [illegible] UNALM
Dr. Guillermo [illegible]

61. [illegible] de [illegible] para la [illegible] de la [illegible] de la [illegible]
Ing. David A. Paumen [illegible] [illegible]
[illegible] La Molina

62. Determinación de [illegible] para la [illegible] de [illegible] semilla de tara (Caesalpinia tinctoria) por vía [illegible] secado por spray dr[illegible].
Ing. Hidelbrando Rojas F. [illegible] La Molina

(*) Proyecto destacado.

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63. **Revitoración** de las plantas [illegible] **desarrollo pecuario** de comunidades de [illegible]
M.V. Armando M. Bazalar R. [illegible]

64. Estudio Silvicultural del [illegible] (Romerillo hembra) en San Ignacio - [illegible].
Ing. Alejandro Gomez Silva [illegible]

65. Comparativo de [illegible] [illegible] de [illegible] [illegible] de [illegible] [illegible] [illegible] [illegible] [illegible] [illegible].
[illegible] Balcázar [illegible] [illegible]
Bach. Miguel E. [illegible]

66. [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] en camélidos sudamericanos en el Departamento de [illegible].
[illegible]
Dr. [illegible] Flores E. UNI del Perú
[illegible]

67. Estudio de [illegible] en camélidos sudamericanos [illegible] [illegible] [illegible] y la fiebre de alpacas.
M.V. Armando Muñoz [illegible] UNMSM

68. [illegible] proyecto para mejorar la producción alimentaria mediante la agricultura familiar [illegible] erradicar el hambre del [illegible].
Ing. Juan [illegible] [illegible] [illegible]

69. Eficacia del extracto de ajo en el [illegible] control de la tascola [illegible] en [illegible].
M.V. Gilberto Fernandez [illegible] [illegible]

70. **Evaluaciones** agronómicas y [illegible] de [illegible] **achiote** (Bixa [illegible]) del Centro **Investigaciones** [illegible]
Ing. Agustín Gonzales [illegible] [illegible]

71. Establecimiento de germoplasma para [illegible] propagación clonal de [illegible] [illegible] [illegible] posibilidades de [illegible] de [illegible] [illegible] [illegible] Mario. Dpto de San Martín.
Ing. Manuel Rojas Tapia [illegible]

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72 **Sacha** Inchi (Plukenetia [illegible]) [illegible] para mejorar la nutrición animal [illegible]
Dr. Hector H. Bernis [illegible]

73 Estudios Silviculturales con especies de rápido crecimiento en zonas [illegible] de Puno [illegible] Dr. [illegible]
[illegible] UNALM

74 Estudio [illegible] de cobertura vegetal en dos zonas de [illegible] frente a humedad, temperatura del suelo [illegible] del orion internal en Puno.
[illegible] UNALM

75 [illegible] de diferentes variedades de [illegible] en la eficiencia de los inoculantes en la [illegible] de la leguminosa.
[illegible] UNALM

76 [illegible] de biotipos [illegible] en la zona del [illegible]
[illegible] UNCP

4 Jun 96 Total = 98

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PROYECTOS APROBADOS CON CONVENIO

AL 30 DE MARZO DE 1990

CUADRO Nº PROYECTOS APROBADOS CON CONVENIO AL 30/MAR/90

CATEGORIA	CAMPO O AREA	PRODUCTO O DISCIPLINA	LINEA DE INVESTIGACION	INSTITUCION	Z O N A	STATUS	OBSERVAC.*	
PRODUCTOS CON POTENCIAL DE EXPORTACION	AGRICOLA	ALGODON	Mejoramiento: Resistencia a wilt	UNP	Piura	E	Ener 89-Dic 89	1
			Entomología: Hospederos "picudo"	UNP	Piura	E/T	Ener-89-Jun 89	4
			Fitopatología: Pudrición carbonosa	UNP	Piura	E	Ener 89-Dic 89	5
			Fisiolg.Manejo: Regulación crecimiento	UNPRG	Lambayeque	E/T	Ener 89-Jun 89	7
			Agronomía: Riegos por densidad, siembra	FONAGRO	Chincha	E	Agos 89-Ago 90	[illegible]
			Entomología: Plagas del algodon	UNALM	Cañete	E	Dic 89-Ene 90	[illegible]
		ESPARRAGO	Manejo: Edad óptima de transplante	UNPRG	Lambay. La Lib.	E	Ener 89-Ago 90	[illegible]
			Agronómico: Fertilización NP	UNPRG	La Libert.	E	Jun 89-Jun91	[illegible]
		VID	Nutrición Mineral: Diagnostico deficiencias	INIAA	Ica	E	Dic 89-Jun 90	[illegible]
			Manejo: Exceso de sales y boro	INIAA	Ica	E	Feb 90-Oct 91	[illegible]
		MANGO	Comercialización: Análisis oferta exportable	UNP	Piura	E	Jul 89-Jul 90	[illegible]
		LIMONERO	Nematología: Control biológico nemátodes	UNP	Piura	E	Abr 89-May 90	[illegible]
		MAIZ MORADO	Mejoramiento: Selección prolificidad	UNPRG	Lambayeque	E	Mar 89-May 90	[illegible]
		FRIJOL DE PALO	Mejoramiento: Selección de lineas	UNPRG	Lambayeque	E	Ener 89-Dic 90	[illegible]
		PALLAR	Mejoramiento: Comparativo 50 cultivares	UNALM	Lima-Cañete	E	Dic 89-Ago 90	[illegible]
		MELON ZAPALLO	Entomología:Dinamica Diaphania	Asoc. Agric. Cañete	Cañete	E	Agos 89-Feb 91	[illegible]
		BOLAINA	Caracteristicas: Empleo en construcción	ICE	Lima	E	Dic 89-Feb 90	[illegible]
		ACHIOIE	Caracterización: Evaluación Agronómica de agrotipos	IIAP	Iquitos	E	Mar. 90-Ene.91	
		TOPA-JACARANDA	Turno óptimo de rotación y regeneración natural	UNALM - UNU	Pucallpa	E	Mar. 90-Nov.91	[illegible]

E Proyectos en Ejecución
E/T Proyectos Terminados
* Fecha de Inicio y Término del Proyecto

18

CATEGORIA	CAMPO O AREA	PRODUCTO o DISCIPLINA	LINEA DE INVESTIGACION	INSTITUCION	Z O N A	STATUS	OBSERVAC.	
AGROIN-DUSTRIA	ALMACENAMIENTO	NARANJA	Almacenamiento en condiciones hipobáricas	UNALM	Puno	E	Agos 89-Mar 90	32
	PROCESAMIENTO	PAPA	Elaboración del Tocosh	UNALM	Huancayo	E	Ago 89-Ago 90	44
	PROCESAMIENTO	TARWI-OCA	Parámetros procesos cultivos andinos	INIAA	Huancayo	E	Dic 89-Jun 90	49
	EXTRACCION	JENJIBRE	Extracción oleorresinosa	UNALM	Lima	E	Dic 89-Jun 90	46
	PROCESAMIENTO	TARA	Extracción de goma de semilla	INIAA	Lima	E	Feb 90-Mayo 91	62
	ALMACENAMIENTO	PEPINO DULCE	Almacenamiento Post-cosecha	UNALM	Lima	Diferido		60

CATEGORIA	CAMPO O AREA	PRODUCTO o DISCIPLINA	LINEA DE INVESTIGACION	INSTITUCION	Z O N A	STATUS	OBSERVAC.
PRODUCTOS DE CONSUMO INTERNO	AGRICOLA	ARROZ	Manejo almácigo: Sistema DAPOG	UNPRG	Lambayeque	E	Ene 89-Dic 89
			Mejoramiento: Empleo cultivo anteras	UNPRG	Lambayeque	E	Jun 89-Dic 93
			Fitopatología: Daños por hoja blanca	UNT	Tumbes	E	Mar 89-Set 89
			Agronómico: Densidad semilla siembra directa	UNSM	Tarapoto	E	Ago 89-Dic 89
		PAPA	Mejoramiento: Cruzas dialélicas	UNCP	Huancayo	E	Ago 89-Set 90
			Mejoramiento: Progenitores nativos	UNCP	Huancayo	E	Ago 89-Ago 90
			Mejor-Nemat.: Resist. nemátode quiste	UNCP	Huancayo	E	Dic 89-Jun 90
		MAIZ	Mejor-Fitopat.: Evaluac. germop. virus	UNALM	Lima-Huaraz	E	Ago 89-Ago 90
		HABA	Agronómico: Comparativo herbicidas	UNALM	Huancayo	E	
		GIRASOL	Mejoramiento: Rendimiento y adaptabilidad	UNALM	Costa	E	Dic 89-Jul 90
		VARIOS CULTIVOS	Fitopatología: Control biolól. efect. aplic. estiercol	UNPRG	Lamb-La Lib.	E	Jul 89-Dic 90
		PLATANO	Entomología: Ciclo biológ. gorgojo rayado	UNT	Tumbes	E	Ene 89-Feb 90
		MANZANO	Nutric. Mineral: Patrones nutricionales	Inst. Rural V. Gde.	Cañete	E	Feb 90-Dic 92
		TRIGO	Agronómico: niveles de cobertura vegetal trigo invernal	UNALM	Puno	E	Feb 90-Set.91

CATEGORIA	CAMPO O AREA	PRODUCTO O DISCIPLINA	LINEA DE INVESTIGACION	INSTITUCION	Z O N A	STATUS	OBSERVAC.	
PRODUCTOS DE CONSUMO INTERNO	PECUARIA	VACUNOS	Alimentación: Uso de residuos agroindustriales	UNALM	Lima	E	Dic 89-May 91	44
			Sistema producción en áreas de riego	INIAA	Arequipa	E	Dic 89-Oct 92	45
			Sanidad: Serodiagnósis para IBC	UNMSM	Lima	E	Feb 90-Feb 91	52
			Alimentación: Uso maíz chala	UNJFSC	Huacho	E	Feb 90-Feb 91	41
		CAMELIDOS	Sanidad: Spiculopteragia	UNMSM	Huancayo	E	Dic 89-Dic 90	[illegible]
			Alim-Reproducción: Desarrollo fetal y sobrev.	IVITA	La Raya	E/C	Ene 89-Oct 90	2
			Sanidad: Sarcocystis	UNCP	Huancavelica	E		[illegible]
			Sanidad: Micoplasmosis	UNMSM	Arequipa	E		[illegible]
			Genética: Análisis cromosómico	Inst. inv. altura UPCH	Puno	E	Feb 90-Feb 91	[illegible]
		PORCINOS	Sanidad: Vacuna para Cysticercosis	PRISMA	Lima-Huancayo	E/T	Feb 89-Ago 89	[illegible]
			Reproducción: Inducción celos fértiles	UNSAM	Lima	E	Feb 90-Feb 91	[illegible]
			Alimentación: Uso de lemnacea.	PRISMA	Lima	E	Feb 90-Feb 91	[illegible]
		CUYES	Mejoramiento: Obtención híbrido comercial	UNCP	Huancayo-Lima	E	Feb 90-May 91	45
		CAPRINOS Y OTROS	Alimentación: Uso fronde de espárrago	UNALM	Lima-La Lib.	E	Feb 90-Dic 91	32
		OVINOS	Sanidad extracto de "arraro" control de alicuya	UNC	Cajamarca	E	Mar 90-Nov 90	[illegible]

E/T Proyecto Cancelado

CATEGORIA	CAMPO O AREA	PRODUCTO o DISCIPLINA	LINEA DE INVESTIGACION	INSTITUCION	Z O N A	STATUS	OBSERVAC.	
RECURSOS NATURALES	FORESTALES	POLYLEPIS	Evaluación de situación	UNALM	Lima-Ancash	E	Ago 89-Ago 90	18
		DIF. ESPECIES	Valor apicola melifero	UNALM	Iquitos	E	Dic 89-Dic 90	22
		ESP. NATIVAS	Establecimiento plantaciones	UNALM	Lima	E	Feb 90-Feb 91	50
		EUCCARPUS	Estudio silvicultural	Partic.	Jaen			44
		OVERO	Métodos de aprovechamiento racional	UNPRG	Lambayeque	E	Ene 89-Nov 90	13
	SUELOS	CONSERVACION	Plan de manejo	UNALM	Chucuito Puno	E	Ago 89-Nov 90	22
		FERTILIDAD	Evaluacion del potencial	UNAP	Iquitos	E	Ago 89-Ago 90	31
		FERTILIDAD	Métodos químicos análisis P y K	INIAA	Lima	E	Feb 90-May 91	56
	REC. AGRICOLAS	PLANTAS MEDIC.	Revaloración valor pecuario	IVITA	Huancayo	E		63
	REC. ANIMALES	LOMBRIZ	Produc. de alimento pecuario y humus	UNCP	Huancayo	E	Ene 89-Mar 90	9
	BACTERIAS	RHIZOBIUM	Potencial fijación	UNALM	Lima	E	Ago 89-Jun 90	26
		RHIZOBIUM	Evaluación cepas-frijol	UNPRG	Lambayeque	E	Ago 89-Dic 90	43
		RHIZOBIUM	Aislamiento de Rhizobium	UNALM	Lima	E	Mar 90-May 91	75
		SACHA-INCHI	Caracterización: Determinación Valor Alimenticio	PRISMA	Tarapoto	E	Mar 90-Ene 91	5
		ALGARROBO	Entomología: Plagas	INIAA	Piura-Ica	E	Abr 90-Mar 93	46
		SACHA-PAPA	Germoplasma para selección destinada a obtención de harina	UNSM	Tarapoto	E	Mar 90-Feb 92	71

CATEGORIA	CAMPO O AREA	PRODUCTO o DISCIPLINA	LINEA DE INVESTIGACION	INSTITUCION	Z O N A	STATUS	OBSERVAC.
AGROSOCIO ECONOMIA Y TRANSFERENCIA DE TECNOLOGIA	ADMINISTRACION	GESTION	Toma de decisión en relación a tenencia	UNALM	LIMA-ICA	E	Nov 89-Oct 90
	AGROECONOMIA	PRODUCCION	Cambios debido a precios	UNALM	LIMA	E	Set 89-Mar 90
	DESARROLLO	PRODUCCION	Est. del sistema producción en Altiplano	NGS	PUNO	E	
	SOCIOECO-DIAGNOST.	MERC. TRABAJO	Estudio mercado trabajo Piura	UNP	PIURA	E	Ene 89-Feb 90
	TRANSFERENCIA DE TECNOLOGIA	PRODUCCION	Niveles tecnológicos, producción papa	UNALM	PUNO	E	Set 89-Dic89
		ANALISIS	Factores que influyen en la transferencia tecnológica	UNALM	CUSCO	E	Dic 89-Set 90

APPENDIX E

TECHNOLOGY TRANSFER

APPENDIX E TECHNOLOGY TRANSFER

TABLE 1: EEA TT PERSONNEL (1)

EEA	CTTs	CSs	Diffusionists and Communicators
Andenes (Cuzco)	2	1	3
Canaan	1	-	-
Canchan (Huanuco)	1	1	2
Chincha (Ica)	1	1	-
Donoso (Huaral)	3	1	-
El Chira (Piura)	1	1	2
El Provenir (Tarapoto)	1	1	2
Ica	1	-	4
Illpa (Puno)	3	1	4
La Agronomica	1	-	2
Los Banos (Cajamarca)	2	1	2
Los Cedros (Tumbes)	2	1	-
Los Pobres (Ica)	-	1	-
Moquegua	1	1	-
Pichanaki	1	-	-
Pucallpa (Ucayali)	1	1	1
Puerto Maldonado	1	-	1
Santa Ana (Huancayo)	1	1	4
San Camilo (Arequipa)	1	1	3
San Ramon	1	-	-
San Roque	1	-	2
Tingua (Huaraz)	1	1	4
Viru (Trujillo)	3	1	3
Vista Florida (Lambayeque)	2	1	5
Yanayacu	1	-	1
Total	34	18(2)	46

(1) Compiled from: 6 June 1990 DGPIST Roster "Especialistas en Transferencia de Tecnologia y Difusion Tecnica"; DGPIST n.d. "Curso de Capacitacion para los Coordinadores de Semillas de PROSEN" [sic]; and 14 June 1990 interview with DGPIST/Lima officials.

(2) Two of the 18 individuals designated as CSs were not locatable from these data sources.

APPENDIX E TECHNOLOGY TRANSFER

TABLE 2: CTTA TRAINING AND PRESENTATIONS, MAY 1989-MAY 1990

	Number of Participants	
Type of Participants (1)	Public	Private
Farmers	n/a	15
Researchers	25	5
Extensionists	5	9
Communicators	16	5
Heads, directors, and advisors(2)	131	51
Other groups (3)	4	106
Total	181	191

(1) Includes women participants.
(2) Organizations not specified in the data provided to the evaluation team.
(3) Includes seed sellers and special projects.

APPENDIX E TECHNOLOGY TRANSFER

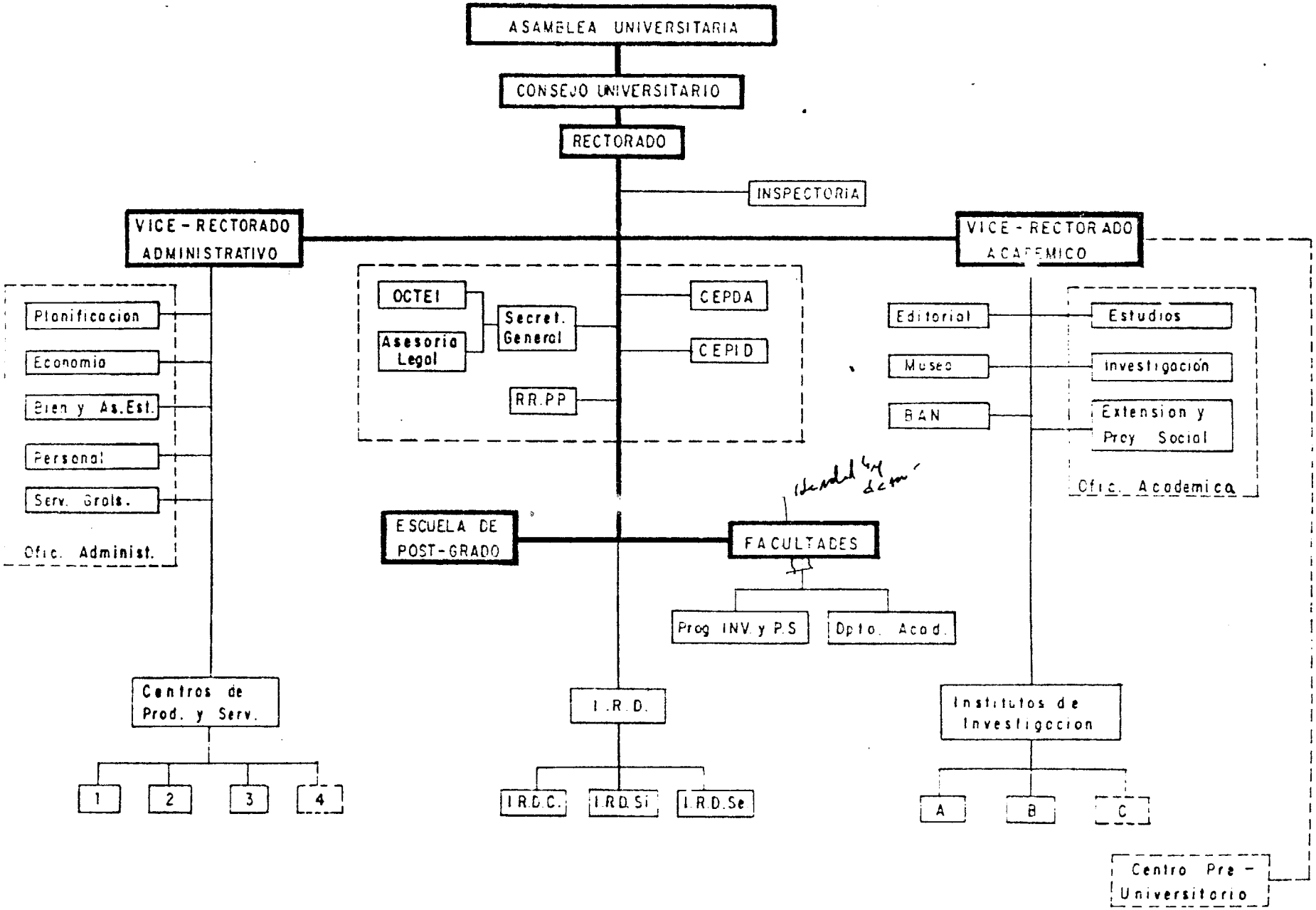
TABLE 3: CTTA USE OF MASS MEDIA, SEP 1989-APR 1990 (1)

	Radio Programs	TT Flyers		Learning Guides	
		No.Items	No.Printed	No.Items	No.Printed
Huaraz	168	-	-	2	2,000
Chiclayo	30	9	9,000	-	-
Puno	54	6	3,000	-	-
Arequipa	62	8	1,600	-	-
Piura	15	3	5,000	-	-
Huancayo	16	-	-	1	250
Cajamarca	12(2)	2	1,000	-	-
Trujillo	-	2	1,000	-	-
Cuzco	n.d.	n.d.	n.d.	-	-
Iquitos	5	1	300	-	-
Tacna	n.d.	n.d.	n.d.	-	-
Moquegua	n.d.	n.d.	n.d.	-	-
TOTAL	362	31	20,900	3	2,250

(1) From CTTA trimesterly reports. n.d. = no data available
(2) Includes only the month of April.

APPENDIX F

ORGANIGRAM - NATIONAL AGRARIAN UNIVERSITY


ASAMBLEA UNIVERSITARIA
CONSEJO UNIVERSITARIO
RECTORADO
INSPECTORIA
VICE - RECTORADO ADMINISTRATIVO
VICE - RECTORADO ACADEMICO
Planificacion
Economia
Bien y As.Est.
Personal
Serv. Grals.
Ofic. Administ.
OCTEI
Asesoria Legal
Secret. General
RR.PP
CEPDA
CEPID
Editorial
Museo
BAN
Estudios
investigación
Extension y Proy Social
Ofic. Academica
ESCUELA DE POST-GRADO
FACULTADES
Prog INV. y P.S
Dpto. Acad.
Centros de Prod. y Serv.
1
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I.R.D.
I.R.D.C.
I.R.D.Si
I.R.D.Se
Institutos de Investigacion
A
B
C
Centro Pre - Universitario

APPENDIX G

HUMAN RESOURCES DEVELOPMENT UNALM-TTA

HUMAN RESOURCE DEVELOPMENT
UNLM-TTA
Strengthening Administration and Teaching Programs

PROJECT OUTPUTS	CONTRIBUTING ACTIVITIES, LOF	PLANNED TO JUNE 1990	ACHIEVED TO DATE
1. Improvement in quality of UNA students.	-Analyze graduate student characteristics and quality in 1990 and in 1993	-Make 1990 analysis of students	- Analysis in progress, preliminary reports available. Study expanded to include information on the participation of women in agricultural science.
	-Revise entrance standards to the Graduate School.		
	-Establish an Orientation Week		
2. Improve planning, resource allocation and control by UNA.	-Establish an Administrative Review Committee.	-Establish Committee	-Committee established
	-Contract a National Advisor or external review team.	-Contract National Advisor	-delayed
	-Analyze the current administrative systems and practices 1990 & 1993.	-Analyze systems and issue reports	-delayed
	-Implement recommendations of external advisors.	-Implement recommendations	-delayed
	-Purchase equipment to improve internal and external communications.	-Prepare purchase orders and specs.	-Specs for communication prepared.
	-Establish Advisory Committee for Research.	-Establish Research Committee	-Committee established.
	-Send Vice Rector for Academic Affairs to the US on observational visit.	-Make invitational travel plans	-Plans made for visit 17th June to 4th July.
	-Develope processes for planning and prioritizing activities of UNA		
	-Develop Annual Research Plan	-Hold workshop on priorities in key areas.	-Taller held. Report ready.
	-Train leaders and middle managers Establish at least four courses in leadership, planning, and technical level activities.	-Hold a Leadership Conference	-plans delayed
3. Strengthen leadership role of Rector's office	-Arrange visit for Rector to US	-Arrange visit of Rector to US	-Rector visited US April 15th to May 11th
	-Establish an Alumni Association	-Plan details of Association	-Draft reglamentos prepared
	-Establish an external advisory council for UNALM		
	-Develop the University Foundation FDA to assume greater role.		

PROJECT OUTPUTS	CONTRIBUTING ACTIVITIES, LOP	PLANNED TO JUNE 1990	ACHIEVED TO DATE
4. Develop incentives program for individual excellence and performance	-Prepare policies and rules for the incentives system	-Establish the Committee on Incentives	-Committee has been appointed
		-Establish policies for incentives for professors and students.	-No report has been issued yet.
5. Revise the curriculum	-Establish Steering Committee at the University level for guiding the curriculum revisions	-Establish Steering Committee	-Committee established and ing.
	-Establish Committees and working groups at the level of the Schools.	-Name all committes and commissions	-Committees named
	-Establish working commissions for the Graduate programs.	-Name commissions	-Commissions named
	-Revise 15 programs of study in the Graduate School.	-Committees and commissions begin work	-Work begun
	-Revise structure of undergrad curriculum.	-Hold two seminar-workshops	-Workshops held involving all committees and commissions
	-Contract National Advisor	-Name National Advisor	-Wilfredo Huerta appointed. Workshop reports prepared.
6. Creation of broad concensus concerning problems and priorities of Peruvian agriculture.	-Hold 12 regional "Conversatories"	-Hold 2 conversatories this period	-plans delayed
	-Organize 12 Campus Seminars on regional problems	-Organize 1 campus seminar	-delayed
	-Publish 3 reports on regional problems.		
	-Establish an external visiting committee for each School.	-Establish at least one committee this period	-One planned but not establish
	-Provide for participation of 50 professors annually in national and international events.		
	-Support 5 conferences, congresses, organized by UNA		

APPENDIX H

POST GRADUATE FELLOWSHIP PROGRAMS

ACTIVIDAD 3,C - PROYECTO T.T.A. - FUNDEAGRO

PROGRAMA COMPETITIVO DE ADIESTRAMIENTO Y DE BECAS PARA ESTUDIOS DE POSTGRADO

NOMBRES Y APELLIDOS	DESAPROBADO	APROBADO	M Sexo	F	GRADO
1. Andrés Morgado	X		X		Ph.d. extranjero
2. Pedro Ruiz Cubillas		X	X		Ph.d. extranjero
3. Enrique Moncada Mau		X	X		Ph.d. extranjero
4. Juan Chang Chang Fun		X	X		Maestría extranjero
5. Juan Astorga Neira		X	X		Maestría extranjero
6. Francisco Vásquez Gonzales		X	X		Maestría Perú
7. Fanny Ludeña Urquizo		X		X	Maestría Perú
8. Federico Laura Rojas		X	X		Maestría Perú
9. Abraham Villantoy P.		X	X		Maestría Perú
10. Fernando Rodríguez A.		X	X		Maestría Perú
11. Luis Zúñiga Cernades		X	X		Maestría Perú
12. Freddy Dextre Rueda	X		X		Maestría Perú
13. Everth Castro Céspedes	X		X		Maestría Perú
14. Emili Méndez San Martín	X			X	Maestría Perú
15. Julio Ríos Ramírez	X		X		Maestría Perú
16. Alfredo Rodríguez Delfiu	X		X		Maestría Perú
17. Mario Manda Guevara	X		X		Maestría Perú
18. Luis Benzaquén Torres	X		X		Maestría Perú
19. Víctor Vásquez Arce	X		X		Maestría Perú
20. Manuel Cevallos Ampuero	X		X		Ph.d. extranjero
21. Ricardo Wissar Guerrero	X		X		Ph.d. extranjero
22. Joné Estrada Rondón		X	X		Ph.d. extranjero
23. Miguel Barandiarán		X	X		Ph.d. extranjero
24. Arístides Serruto Colque		X	X		Ph.d. extranjero
25. Mariano Ramos García		X	X		Maestría Perú
26. Máximo Sanabria Sáenz		X	X		Maestría Perú
27. Rafael Villanueva Flores		X	X		Maestría Perú
28. Edwin Zorrilla Delgado		X	X		Maestría Perú
29. Heiter Valderrama Freyre		X		X	Maestría Perú
30. José Atto Mendives		X	X		Maestría Perú
31. Adrián Guzmán Zegarra		X	X		Maestría Perú
32. Andrés Morgado Díaz	X		X		Maestría Perú
33. Miguel Vílchez Manay	X		X		Maestría Perú

NOMBRES Y APELLIDOS	DESAPROBADO	APROBADO	M	F	GRADO
			Sexo		
34.José Luis Davelouis Mc Evoy		X	X		Ph.d extranjero
35.Lucrecia Aguirre Terrazas		X		X	Ph.d extranjero
36.Guillermo Hidalgo		X	X		Maestría Perú
37.Jaime Villavicencio		X	X		Maestría Perú
38.José Vidal Meza		X	X		Maestría Perú
39.Luz Ordoñez Luján		X		X	Maestría Perú
40.Estaban Pinao		X	X		Maestría Perú
41.Hemilce Ibazeta		X		X	Maestría Perú
42.Juan Sanabria		X	X		Maestría Perú
43.Freddy Casanova		X	X		Maestría Perú
44.Carlos Mestanza		X	X		Maestría Perú
45.Nelson Ríos Campos		X	X		Maestría Perú
46.Carlos Bada		X	X		Maestría Perú
47.Saturnino Marca		X	X		Maestría Perú
48.Eroncio Mendoza		X	X		Maestría Perú
49.Roy Froilán		X	X		Maestría Perú
50.Gustavo Castro		X	X		Maestría Perú
51.María del Aguila		X		X	Maestría Perú
52.Juan Aruquipa		X	X		Maestría Perú
53.Teófilo Valderrama		X	X		Maestría Perú
54.Gerardo Pando		X	X		Maestría Perú
55.Pedro Reyes Inca		X	X		Maestría Perú
56.Nestor Farfán Maldonado		X	X		Maestría Perú
57.Wilfredo Guillén		X	X		Maestría Perú
58.Ciria Noli		X		X	Maestría Perú
59.Juan Chiroque		X	X		Maestría Perú
60.Jorge Celis García		X	X		Maestría Perú
61.Víctor Chávez	X	X	X		Maestría Perú
62.Ramiro Pérez Prado		X	X		Maestría Perú
63.José Torres Lizárraga		X	X		Maestría extranjero
64.Walter Salvador Marcelo		X	X		Maestría Perú
65.Omar Galarza Leiva		X	X		Maestría Perú
66.Carlos Díaz Pérez		X	X		Maestría Perú
67.Zoilo Córdova Guerra		X	X		Maestría Perú

NOMBRES Y APELLIDOS	DESAPROBADO	APROBADO	M Sexo	F	GRADO
68.Felizardo Fabián Vergara		X	X		Maestría Perú
69.Grety Arriaga Pinedo		X		X	Maestría Perú
70.María Morales Copara		X		X	Maestría Perú
71.Víctor Calvo Mormontoy		X	X		Maestría Perú
72.Hermenegildo Huaquisto C.	X		X		Maestría Perú
73.Orlando Ramos Mellarez	X		X		Maestría Perú
74.Segundo Vásquez V.	X		X		Maestría Perú
75.Segundo Sánchez Cusma	X		X		Maestría Perú
76.Victoriano Celis Jiménez	X		X		Maestría Perú
77.Orlando Vega Calderón	X		X		Maestría Perú
78.Carlos Chuquicaja Segura	X		X		Maestría Perú
79.Eduardo Oblitas Quispe	X		X		Maestría Perú
80.Rita Riva Ruiz	X			X	Maestría Perú
81.Alexander Chávez Cabrera	X		X		Maestría Perú
82.Haydee Cárdenas Quintana		X		X	Maestría Perú
83.Juan Lapeyre		X	X		Maestría Perú
84.Angel Tornamira		X	X		Maestría Perú
85.Andrés Pérez Pachari		X	X		Maestría Perú
86.Miguel Román Campana		X	X		Maestría Perú
87.Máximo Mendoza Gamarra		X	X		Maestría Perú
88.Daniel Canaza Mamani		X	X		Maestría Perú
89.Ana Arias Jiménez		X		X	Maestría Perú
90.Moisés Pachas		X	X		Maestría Perú
91.Miguel Rodríguez Ponce		X	X		Maestría Perú
92.Fernando Huapaya Estrada		X	X		Maestría Perú
93.Dimas Loayza Gonzales		X	X		Maestría Perú
94.Samuel Pino Valencia		X	X		Maestría Perú
95.Luis Barriga Carrión		X	X		Maestría Perú
96.Juan Mendiola	X		X		Maestría extranjero
97.Doraliza Huallanca	X			X	Maestría extranjero
98.Mercedes Auris	X			X	Maestría extranjero

NOMBRES Y APELLIDOS	DESAPROBADO	APROBADO	M	F	GRADO
			Sexo		
99.Judith Kuan	X			X	Ph.d. extranjero
100.Eleodoro Chahuares		X	X		Implementación beca Ph.d. extranjero
101.Adriana Silva Rojas	X			X	Maestría extranjero
102.Claudia Huicho O.	X			X	Maestría extranjero
103.Máximo Gutiérrez B.	X		X		Maestría extranjero
104.Carlos Reynel R.	X		X		Maestría extranjero
105.Lucio Otazú Arana	X		X		Maestría Perú
106.Guido Manuel Pérez Durand	X		X		Maestría Perú
107.Luis Manuel Vargas	X		X		Maestría Perú
108.Natalio Luque Mamani	X		X		Maestría Perú
109.Porfirio Calle Mollo	X		X		Maestría Perú
110.Magno Coronel Orozco	X		X		Maestría Perú
111.Saúl Espinoza Molina	X		X		Maestría Perú
112.Máximo Mello Ancasi	X		X		Maestría Perú
113.Rolando Rojas Espinoza	X		X		Maestría Perú
114.Rómulo Valdivia Z.	X		X		Maestría Perú
115.Gloria Quintana Cárdenas	X			X	Maestría Perú
116.Manuel Reyna Terrones	X		X		Maestría Perú
117.Julio Ríos R.	X		X		Maestría Perú
118.Emilio Méndez San Martín	X		X		Maestría Perú
119.Alfredo Rodríguez Delfiu	X		X		Maestría Perú
120.Everth Castro Céspedes	X		X		Maestría Perú
121.Segundo Vásquez Vásquez	X		X		Maestría Perú
122.Alexander Chávez	X		X		Maestría Perú
123.Omar Urbano	X		X		Maestría Perú
124.Eduardo Oblitas Q.	X		X		Maestría Perú
125.Victoriano Celis	X		X		Maestría Perú
126.Jorge Llontop	X		X		Maestría Perú
127.Manuel Vargas	X		X		Maestría rú
128.Teodulio Reyes	X		X		Maestría extranjero
129.Juan Francisco Crisanto	X		X		Maestría extranjero

TOTAL: Solicitudes Presentadas 129

Solicitudes Aprobadas 56

Appendix D

ANEXO Nº 1

BECAS OTORGADAS PARA ESTUDIOS DE DOCTORADO

Nº becarios	PROCEDENCIA	ESPECIALIDAD
1	[illegible]	Economía Agrícola
1	[illegible] - EE.UU. Canadá	Bioquímica Molecular
1	[illegible] Nac. del Altiplano - Puno	Administración de Canas
1	[illegible] Nac. del Altiplano - Puno	Economía Agrícola
1	[illegible]	Suelos

TOTAL 5

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ANEXO Nº 2

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BECAS OTORGADAS PARA ESTUDIOS DE POSTGRADO EN EL PERU

Nº becarios	PROCEDENCIA	ESPECIALIDAD
1	INA	Tecnología de Alimentos
1	Universidad Nac. de la Amazonia Peruana	Producción Agrícola
1	Universidad Nacional de Piura	Producción Animal
1	INIAA	Mejoramiento Genético de Plantas
1	INIAA	Entomología
1	Cooperativa Agraria Agroindustrial Naranjillo Ltda.	Producción y Extensión Agrícola
1	Universidad Nac. Pedro Ruiz Gallo	Entomología
1	Asociación de Agricultores de Cañete	Entomología
1	INIAA	Entomología
1	Universidad Nac. del Centro del Perú	Entomología
1	INIAA - EEA. San Roque	Economía Agrícola
1	INIAA - EEA. Illpa	Producción Agrícola
1	INIAA - EEA. Canchán	Producción Agrícola
1	INIAA - EEA. Baños del Inca	Producción Animal
1	INIAA - EEA. Pucallpa	Producción Agrícola
1	INIAA - Sede Central	Producción y Extensión Agropecuaria
1	INIAA - EEA. Illpa	Producción y Extensión Agropecuaria
1	INIAA - EEA. Canchán	Producción Agrícola
1	INIAA - EEA. La Molina	Producción Animal
1	INIAA - EEA. Forestal Pucallpa	Industrias Forestales
1	INIAA - EEA. Los Pobres	Producción Agrícola
1	INIAA - EEA. Santa Ana	Producción Animal
1	INIAA - EEA. Vista Florida	Fitomejoramiento Genético
1	INIAA - EEA. Santa Ana	Producción Agrícola
1	INIAA - EEA. La Molina	Suelos
1	INIAA - EEA. Baños del Inca	Nutrición Animal
1	INIAA - EEA. Tulumayo	Fitomejoramiento Genético
1	INIAA - EEA. Canaán	Fitopatología
1	INIAA - EEA. Canchán	Suelos
1	Inst. de Invest. de la Amazonia Peruana	Suelos
1	Universidad Nac. de la Amazonia Peruana	Industrias Forestales

Nº BECARIOS	PROCEDENCIA	ESPECIALIDAD
1	INIAA - EEA, La Molina	Suelos
1	Ministerio de Agricultura	Producción [illegible]
1	Universidad Nacional de Piura	Suelos
1	Universidad Nac. de Educ. La Cantuta	Producción Animal
1	Universidad Nacional San Agustín	Ingeniería de Recursos de Agua y Tierra
1	Universidad Nacional de Ica	Suelos
1	Universidad Nacional del Altiplano	Suelos
1	Universidad Nacional del Centro del Perú	Economía Agrícola
1	Universidad Nacional Pedro Ruiz Gallo	Economía Agrícola
1	Universidad Nacional de Piura	Suelos y Fertilizantes
1	INP	Economía Agrícola
1	Universidad Nacional Agraria La Molina	Economía Agrícola
1	INIAA - EEA, Huancayo	Mejoramiento Genético de Plantas
1	INIAA	Investigación Pecuaria
1	INIAA - EEA, Pucallpa	Suelos y Fertilizantes
1	INIAA - EEA, Huancayo	Nutrición Animal
1	INIAA - EEA, Tingo	Economía Agrícola
1	INIAA	Suelos y Fertilizantes
1	INIAA	Economía Agrícola
1	INIAA - EEA, Tingo	Mejoramiento Genético de Plantas
1	PONAGRI - Chincha	Ingeniería Agrícola
1	Universidad Nacional Pedro Ruiz Gallo	Mejoramiento Genético de Plantas
1	Universidad Nacional Pedro Ruiz Gallo	Producción Agrícola
1	Universidad Nacional Pedro Ruiz Gallo	Producción Animal
1	PONAGRI - Chincha	Administración de Empresas

TOTAL 56

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ANEXO Nº 3

BECAS OTORGADAS PARA ESTUDIOS DE MAESTRIA EN EL EXTRANJERO

Nº BECARIOS	INSTITUCION	ESPECIALIDAD
1	Ministerio de Agricultura	Agrometeorología
1	Centro Internacional de la Papa	Microbiología de suelos
1	Universidad Nacional de Piura	Reproducción Animal e Inseminación Artificial
1	Universidad Nac. de la Amazonía Peruana	Nematología
1	INIAA - EEA. La Molina	Patología de Plantas
1	UNA - Arturo Flaib y la Estrella Ltda.	Ciencias Alimentarias
1	Universidad Peruana del Sagrado Corazón	Microbiología de Alimentos
1	Universidad Peruana del Sagrado Corazón	Biotecnología
1	Universidad del Pacífico	Economía Agrícola
1	Universidad Nacional Mayor de San Marcos	Biotecnología de Plantas
1	UNA	Conservación de Recursos Naturales
1	ASA Alimentos S.A.	Ciencia y Tecnología de Alimentos
1	INIAA	Agrometeorología
1	INIAA - EEA. Iquitos	Fisiología Vegetal
1	BRADE	Economía Agrícola
1	UNA	Economía Agrícola

TOTAL 16

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ANEXO Nº 4

[illegible] PARA CURSOS. EVENTOS DE CONTACTO Y REFRESCAMIENTO

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Nº BECARIOS	PROCEDENCIA	ESPECIALIDAD
1	Universidad Nacional de Piura	Formación de Empresas Agrícolas
1	Universidad Nacional Agraria La Molina	Rhizobiología
1	INIAA - Lima	Suelos Tropicales
1	Universidad Nacional de Piura	Control Biológico de Macrofomina
1	Universidad Nacional Pedro Ruiz Gallo	Tratamiento Post-cosecha de Frutales
1	Universidad Nacional Agraria La Molina	Fibras Animales Especiales
1	Universidad Nacional Agraria La Molina	Crecimiento Radicular y Fijación de Nitrógeno
1	Universidad Nacional Agraria La Molina	Silvicultura
1	INIAA - Lima	Tecnología de Producción de Arroz
1	INIAA - Lima	Semillas
1	INIAA - Lima	Producción Animal
1	INIAA - San Camilo	Producción Semilla. Arroz y Frijol
1	Universidad del Pacífico	Política Macroeconómica de Ajuste y su Efecto en la Política Alimentaria
1	RITECSA	Riego a Presión
1	INIAA - San Camilo	Producción Semilla. Arroz y Frijol
1	Asociación Peruana de la Jojoba	Jojoba
1	IIAP - Iquitos	Recursos Hidrobiológicos
1	Asociación Peruana de la Jojoba	Jojoba
1	Universidad Nacional Pedro Ruiz Gallo	Gerencia de Agronegocios
1	Universidad Nacional Pedro Ruiz Gallo	Tejidos y Cultivo Celular

TOTAL 20

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ACADEMIC DEGREE SCHOLARSHIPS OFF SHORE

1988

Name	Peruvian Sponsoring Institution	Name of University	Country	Type of Degree	Area of Study	Date to Initiate Study	Date to Terminate Study	Who Paid	Estimated Total Cost
Bruzzone Carlos	INIAA	Oregon State University	U.S.A.	Ph.D.	Plant Breeding Cereals	July 1988	Jan. 1991	NCSU	33,280.00
Davelouis Luis	UNA	NCSU	U.S.A	Ph.D.	Soils	May 1988	Dec 1989	NCSU	24,780.00
Astorga Juan	Univ. Altiplano Puno	Utah Univ.	U.S.A.	Ph.D.	Range Sc.	Dec 28	Dec 1992	MIAC	58,000.00
TOTAL									116,060.00

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ACADEMIC DEGREE SCHOLARSHIPS OFF SHORE

1989

Name	Peruvian Sponsoring Institution	Name of University	Country	Type of Degree	Area of Study	Date to Initiate Study	Date to Terminate Study	Who Paid	Estimated Total Cost
Aguirre Lucrecia	INIPA Cuzco	Utah Univ.	U.S.A.	Ph.D.	Range Science	January	June 30	NCSU	2,444.00
Ruiz C. Pedro	CIP	NCSU	USA	Master	Soils Microbiol.	January	Dec 1990	NCSU	39,790.00
Narro Luis	INIAA Cajamarca	ISU	U.S.A	Ph.D.	Genetics	January	Feb 28 1990	MIAC	21,000.00
Chang Juan	Ministerio Agricultura	Missouri Univ.	U.S.A	Master	Agriculture Meteorology	January	Dec 1990	MIAC	35,500.00
Torres Jose	INIAA	Esc.Post Grado	Chapingo Mexico	Master	Plant Pathology	July 19	July 1991	MIAC	22,711.00
Samabria Maximo	Univ. de la Amazonia Peruana	Esc.Post Grado	Chapingo Mexico	Master	Plant Pathology	July 19	July 1991	MIAC	22,711.00
Guzman Adrian	Univ. Nac. Piura	Univ. Austral	Valdivia Chile	Master	Animal Reproduction	July 29	July 1991	MIAC	18,726.00
Moneada Enrique	UNA	Colorado St. Univ.	U.S.A.	Ph.D.	Water Res.	Aug. 13	Aug.1992	MIAC	58,180.10
TOTAL									221,062.00

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ACADEMIC DEGREE SCHOLARSHIPS OFF SHORE

1990

Name	Peruvian Sponsoring Institution	Name of University	Country	Type of Degree	Area of Study	Date to Initiate Study	Date to Terminate Study	Who Paid	Estimated Total Cost
Estrada R. Jose	IICA	NCSU	U.S.A.	Ph.D.	Agricult. Economics	January	March 31 1993	NCSU	54,854.00
Baramdiaram Miguel	INIAA Cajamarca	ISU	U.S.A.	Ph.D.	Molecular Biology	Jan 13	Dec 1992	MIAC	59,464.00
Villanueva Rafael	Cia. Arturo Field y La Estrella Ltda.	Kansas St.Univ.	U.S.A.	Master	Food Science	January	Oct 1991	MIAC	33,371.00
Serruto C. Aristides	Univ. Nac. Puno Altiplano	Escola Politecnica	Sao Paulo Brasil	Ph.D.	Farm Management	August	Jul 30 1993	MIAC	32,138.00
Reina S. Laura del R.	Univ. Femenina del Sagrado Corazon	North Carolina St. Univ.	Raleigh U.S.A.	Master	Food Science	August	Jul 1992	NCSU	35,000.00
Garcia V. Gladys H.	Univ. Femenina del Sagrado Corazon	Univ. of Illinois at Urbana	Urbana Illinois U.S.A.	Master	Food Science	August	Jul 1992	NCSU	35,000.00
Beltran Arlette	Univ. del Pacifico	Univ.of Illinois at Urbana	Urbana Illinois	Master	Agricult. Economics	August	Aug 1992	NCSU	35,000.00
Dorregaray Flor	UNMSM	CINVESTAV	Irapuato Mexico	Master	Biotechnology of Plants	August	Aug 1992	NCSU	25,000.00
Flores Patricia	ONA	North Carolina St.Univ.	Raleigh U.S.A.	Master	Forestry	August	Aug 1992	NCSU	35,000.00
Garcia A.Maria	ASA Alimentos S.A.	North Carolina St. Univ.	Raleigh U.S.A.	Master	Food Technology	August	August 1992	NCSU	35,000.00
Garcia Godila	INIAA	Esc.Sup.Agr Luis de Queiroz	Piracicaba Brasil	Master	Agrometeorology	April	1992	NCSU	25,000.00
Tanchiva Elva	INIAA Iquitos	CATIE	Costa Rica	Master	Vegetal Phisiology	August	Aug 1992	NCSU	25,000.00

Montabelti Ernesto	GRADE	Cornell Univ.	New York U.S.A.	Master	Agricult. Economics	August	Aug 1992	NCSU	35,000.00
Quijandria Alvaro	CONFIEP	North Carolina St.Univ.	Raleigh U.S.A.	Master	Agricult. Economics	August	Aug 1992	NCSU	35,000.00
Chahuares Eleodoro	Univ.Nac.Puno Altiplano	Univ.Chapingo	Mexico	Ph.D	Agricul. Economics	August	Aug	NCSU	3,593.00
Cardama Italo	EEA San Roque Loreto	Univ. Pto.Rico Recinto Univer sitario Mayaguez	Puerto Rico	Master	Agronomy Crops	August	Aug 1992	NCSU	32,483.00
Banegas Mariano	INIAA-Puno EEA Illpa	Col.Postgrad. Univ. Chapingo	Mexico	Master	Agrometeoro logy	August	Aug 1992		33,046.00
C stro gel	Univ. Nac. de Santa-Chimbote	Univ.Autonoma Metropolitana	Mexico	Master	Vegetable Crops	September	Sept. 1992		33,046.00
umpiu rio lvia	Taller Diseno Julio Varela	University of Pennsylvania	U.S.A. Philadelphia	Master	Architecture	September	Sept. 1992	NCSU	35,638.00
lbujar reddy	Univ.Nac.Mayor San Marcos	Univ. Rodrigo Facio	Costa Rica	Master	Biotechno-logy	August	Aug. 1992		17,416.00
Total									655,049.00

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APPENDIX I

NON-DEGREE TRAINING PROGRAM

Appendix E

NON-ACADEMIC DEGREE SCHOLARSHIPS
1988

#	Name	Peruvian Sponsoring Institution	Travel Site	Host Country Sponsoring Institution	Area or Specialization	Type of Study	Dates of Travel	Who Paid	Estimated Cost $	Final Cost $
1.	Chavez V. Antonio	INIAA	Colombia	PROCIANDINO	Int'l Building	Conference	Aug27-Set. 4	NCSU	1,113.00	1,098.89
2.	Quevedo A. Roger	INIAA	Colombia	PROCIANDINO	Int'l Building	Conference	Aug 27-Set. 4	NCSU	1,113.00	1,098.89
3.	Pacora C. Lander	FUNDEAGRO	Quito Bogota Caracas Miami Ottawa Los Angeles		Int'l Building Int'l Building Int'l Building Int'l Building Int'l Building Int'l Building	Visit Visit Visit Visit Visit Visit	4-5/09 6-7/09 8-9/09 10-12/09 13-14/09 15-17/09	NCSU NCSU NCSU NCSU NCSU NCSU	2,807.25	1,687.04
4.	Panta Sebastian	INIAA	Colombia	CIAT	Rice Agronomy	In-Service	Set 9 Set 23	NCSU	1,051.55	320.74
5.	Abad Gloria	CIP	Raleigh U.S.A.	North Carolina St. University	Plant Pathology	In-Service	October December	NCSU	4,000.00	4,000.00
6.	Fairlie Tommy	INIAA	Colombia	CIAT	Seeds	Short Course	Oct 31 Nov 4	NCSU	805.00	766.08
7.	Navarrete Luis	INIAA	Colombia	CIAT	Seeds	Short Course	Oct 31 Nov 4	NCSU	805.00	766.00
8.	Pashanasi Beto	INIAA	Mexico	Ecology Institute	Micro Biology	Short Course	Nov 15 Dec 23	NCSU	1,687.50	2,460.89
9.	Caballero Carlos	UNA	Chile	Pontificia Univ.	Rhizo-Biology	Short Course	Nov 20 Nov 25	MIAC	1,061.00	667.00
10.	Bermejo Elsa	Universidad de Piura	Mexico	Panamericana Univ.	Sociology & applied economics	Short Course	Dec 29/88 Dec 89	MIAC	4,990.00	4,990.00
	TOTAL									17,853.7

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NON-ACADEMIC DEGREE SCHOLARSHIPS
1989

#	Name	Peruvian Sponsoring Institution	Travel Site	Host Country Sponsoring Institution	Area or Specialization	Type of Study	Dates of Travel	Who Paid	Estimated $	Final Cost
1.	Manrique Antonio	UNA	Mexico	CIMMYT	Wheat & Corn Extension	Visit	Apr 17- Apr 21	NCSU	420.00	420.00
2.	Valdivieso Pedro	UNA	Canada Calgary	VISIONS'89	Rural Extension	Conference	Apr 28- May 10	MIAC	3,562.00	3,379.00
3.	Ruiz de S. Cesar	UNA	Rio de Janeiro	Universidade Federal	Biology	Conference	Jun 12- Jun 23	NCSU	600.00	604.46
4.	Chavez V. Antonio	INIAA	U.S.A. Minneapolis	Univ. of Minnesota	Int'l Building	Short Course	Jun 06- Jul 09	MIAC	7,232.00	7,135.00
5.	Llerena P. Carlos	UNA	U.S.A. Colorado	Colorado State University	Soil & Water	Short Course	Jun 5- Jun 30	NCSU	6,619.50	6,689.00
6.	Scheuch H. Federico	FUNDEAGRO	Ecuador Ibarra	INIAP	Research	Conference	Jun 24- July	MIAC	922.26	799.00
7.	Abad Gloria	CIP	U.S.A. Raleigh	North Carolina State Univ.	Plant Pathology	In-Service	July to October	NCSU	4,000.00	4,000.00
8.	De Cordova Oscar R.	UNA	Ecuador Quito	PROCIANDINO	Research	Conference	Jul 03- Jul 05	NCSU	803.26	735.43
9.	Guerra G. Hernando	ONA	U.S.A. Washington	ACDI	Administration	In service	Jul 29- Oct 08	MIAC	13,120.00	13,120.00
10.	Quijano Javier	Comite Prod. Mango	Mexico	Mazatlan	Research & Exportation	Conference	Jul 08- Jul 25	MIAC	1,150.00	965.00
11.	Robles Fausto	ONA	Mexico & U.S.A.	Mazatlan	Research Exportation	Conference	Jul 08- Jul 26	MIAC	3,270.00	2,843.00
12.	Ramirez Luis	UNA	U.S.A. Washington	American Statistical Association	Statistics	Short Course	Aug 3 - Aug 10	MIAC	3,425.00	1,262.00
13.	Cubas Eddie	Convenio CNPA/ECASA	Colombia Cali	CIAT	Seed quality	In service	Aug 12 Oct 14	MIAC	640.00	875.00
14.	Montoya Orlando	Convenio CNPA/ECASA	Colombia Cali	CIAT	Seed quality	In service	Aug 12 Oct 14	MIAC	3,821.00	4,218.00

15.	del Villar Javier	Convenio CNPA/ECASA	Colombia Cali	CIAT	Seed quality	In Service	Aug 12 Oct 14	MIAC	640.00	974.00
16.	Delgado J. Martin	Universidad de Piura	U.S.A. Oklahoma	Oklahoma State University	Biological control	In Service	Aug 3/89 Feb 4/90	MIAC	9,335.50	9,335.00
17.	Redolfi de Huiza Ines	UNA	Argentina Tucuman	CIRPON/FAO	Biological control	Conference	Sep 4- Sep 8	MIAC	1,283.44	838.00
18.	Velazco Eyla	INIAA/UNA	Brasil Sao Paulo	IAC	Biological control	Conference	Sep 10 Sep 15	MIAC	986.00	1,150.00
19.	Massaro Alberto	ONA	U.S.A.	ISU	Management skills	Visit	Sep 21- Oct 13	MIAC	4,000.00	4,015.00
20.	Door Christian	UNA	Frankfurt Germany	Universitat Marburg	Forestry	Conference	Oct 08- Oct 19	MIAC	1,587.00	1,587.00
21.	Carpio Manuel A.	UNA	Aachen Germany	Technical School	Research on Fibers	Conference	Oct 16- Oct 25	NCSU	2,473.23	2,419.73
22.	Pizardi Diaz Cesar	UNA	Rio Janeiro Brasil	SBCTA	Research Food Science	Conference	Oct 15- Oct 20	MIAC	1,303.15	1,419.00
23.	Rios Rios Elva Ma.	UNA	Rio Janeiro Brasil	SBCTA	Research Food Science	Conference	Oct 15- Oct 09	NCSU	1,278.15	1,335.23
24.	Icochea S. Luis	UNA	Newfound-land Canada	ISOFO	Fisheries Research	Conference	Oct 21- Oct 28	MIAC	1,916.00	2,284.00
25.	Baumann Samanez David	Inst. Rural Valle Grande	Santiago Chile	Fundacion Chile Asoc.Export.	Extension	Conference	Nov 02- Nov 12	MIAC	1,916.00	2,072.00
26.	Mimbela Luis	Univ. Pedro Ruiz Gallo	California U.S.A.	U.C. Davis	Reserch Post Harvest	In-Service	Dec 16- Ago 16 1990	MIAC	17,475.00	17,475.00
	TOTAL									91,949.35

NON-ACADEMIC DEGREE SCHOLARSHIPS
1990

#	Name	Peruvian Sponsoring Institution	Travel Site	Host Country Sponsoring Institution	Area or Specialization	Type of Study	Dates of Travel	Who Paid	Estimated $	Final Cost $
1.	Julca Miriam	UNA	Rio Janeiro Brasil	EMBRAPA	Biology Nitrogen-Fixation	In Service	Jan 13-Mar 14	NCSU	4,150.00	
2.	Ramirez Alfredo	Ministerio Agricultura	Telaviv Israel	Kibutz Shefayim	Farm Management	In Service	Jan 16-Mar 17	NCSU	1,700.00	
3.	Pacora Lander	FUNDEAGRO	Santiago Chile	INIA	Int'l Building	Visit	Jan 20-Jan 26	NCSU	1,190.00	
4.	Ravettino Rafael	FUNDEAGRO	Santiago Chile	INIA	Int'l Building	Visit	Jan 20-Jan 26	NCSU	1,190.00	
5.	Villaroel Arturo	SAIS Pachacutec	San Jose Costa Rica	ASD	Farm Management	In Service	Feb 12-Mar 10	MIAC	4,202.54	
6.	Mateo O. Basilio	SAIS Pachacutec	San Jose Costa Rica	ASD	Farm Management	In Service	Feb 12-Mar 10	MIAC	4,202.54	
7.	Tepe S. Cesar A.	Est. Exp. San Ramon	Tokio Japon	INIAA/JICA	Rice	In Service	Feb 5-Nov 24	NCSU	480.00	
8.	Saenz Y. Domingo	UNA	Mexico U.S.A.	IBM Cuernavaca Laboratory N.Y.	Statistics	Short Course	Mar 4-Mar 14	NCSU	2,535.00	
9.	Garcia S. Rafael	IIAP Iquitos	Rio Brasil	Univ. Federal		In Service	Mar 3-Sept.	NCSU	1,275.00	
10.	Sanchez G. Marimes	Inst. Inv. Nutricional	Sao Paulo Brasil	Nutrition Institution	Nutrition	Seminar	March 3 - 7	NCSU	1,808.00	
11.	Zavaleta Nelly M.	Inst. Inv. Nutricional	Sao Paulo Brasil	Nutrition Institution	Nutrition	Seminar	March 3 - 7	NCSU	1,808.00	
12.	Spadaro Garcia, Pedro	ONA	San Jose Costa Rica	Univ.Costa Rica-ALCCTA	Food	Seminar	April 1-6	MIAC	4,102.00	
13.	Martinez Espinoza, Juan	ONA	San Jose C. Rica	Univ.Costa Rica-ALCCTA	Food	Seminar	April 1-6	MIAC	4,102.00	
14.	Sifuentes Villanueva Abel	UNA	San Jose C. Rica	Univ.Costa Rica-ALCCTA	Food	Seminar expositor	April 1-6	MIAC	4,102.00	

15.	Hurtado M. Juan Carlos	Univ. del Pacifico	Cambridge Massachuttes	Univ. of Harvard	Food Policy	Workshop	July 9 Aug. 15	NCSU	7,332.00
16.	Solis Orlando	Ministerio Agricultura	Asuncion Paraguay	Asociacion Latinoamericana de Jojoba		Conference	June 17-22	MIAC	2,124.00
17.	Romdon Alfredo	IIAP	Colombia Bogota	Consejo Coop. Amazonica		Seminar	May 2 - 5	NCSU	1,162.00
18.	Quijandria Miguel	EEA Chincha	Ecuador Quito	RELEZA I	Seed	Seminar	May 5 - 9	MIAC	1,212.00
19.	Arana Freddy	INIAA	USA Mississipi	Mississipi	Seed	Course	July 1 Nov. 30	MIAC	17,003.00
20.	Flores Ricardo	INIAA Arequipa	Colombia Cali	CIAT	Beans	In-Service	May 27 July 6	MIAC	3,120.00
21.	Santamaria Pantaleon	INIAA Lambayeque	Colombia Cali	CIAT	Rice	In-Service	May 27 July	MIAC	3,100.00
22.	Mendoza Casimiro	RITECSA	Israel Tel-Aviv	CINADCO	Riego a Presion	Short Course	May 15 July 5	NCSU	1,650.00
23.	Cordero Alfonso	INIAA	Brasil Campinas	Asociacion Latinoamericana Prod. Animal		Short Course	July 22-27	NCSU	1,440.00
24.	Molina O. Juan Pablo	INIAA Cusco	Ecuador Quito	RELEZA I	Grain Legumes	Conference	May 5-9	NCSU	802.00
25.	Delgado P. Guillermo	Univ. Pedro Ruiz Gallo Lambayeque	Amsterdam The Nether-lands	Int'l Association for Plant Tissue Culture	Biology	Congress	June 24-29		1,500.00
26.	Navas R. Cesar	Asociacion Peruana de la Jojoba	Asuncion Paraguay	Asociacion Latino americana de Jojoba		Conference	June 17-25		1,975.00

TOTAL

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TABLE 4. Summary of Non-degree Training Programs by Type and Area, 1988-1990

Type and Area	YEARS 1988	1989	1990	Total
	(Number of participants)			
Observational Training (less than one month)				
Institutional Bldg.	8	0	8	16
Nutrition		2	5	7
Statistics	0	1	1	2
Agr. Exports		2		2
Agr. Ext.		1	1	2
Agr. Policy			1	1
Other		7		7
Sub-Total	8	13	16	37
Impact Training (Usually a semester)				
Biological Nit.Fixation	1	0	1	2
Farm Management	0	0	3	3
Rice Research	1	0	2	3
Seed Programs	2	3	1	6
Biological Control	1	4	0	5
Science Mgt.	0	2	0	2
Other	2	4	3	9
Sub-Total	7	13	10	30
TOTAL	15	26	26	67

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TABLE 5. Results of survey on Evaluation of Non-Academic Scholarships

Questions	Observational Visits	Conferencies Seminars	Impact
	%	%	%
1. Duration of event	100 - OK	89-OK 11-Longer	88-OK 12-Longer
2. Objective/Content			
- As expected	100	50	25
- Better than expected	-	44	75
- Less than expected	-	6	-
3. Coordination/Logistical Support	100 - OK	100 - OK	100-OK
4. Financial Support			
- Adequate	100	87	75
- Not adequate	-	13	25
5. Professional Formation	Yes	Yes	Yes
- Immediate use	100	75	88
- Future use	-	25	12
6. Recomend event for others	100-Yes	100-Yes	100-Yes
- Why	Better Under-standing	- Refresher - Interchange	- Practical - Interchange
7. Attend similar event	100-Yes	100-Yes	100-Yes
- Why	Interchange	Interchange	Cont. Ed.
8. Benefit to whom			
- Personal	66	44	75
- Institution	66	56	88
- Country	66	81	88

APPENDIX J

LISTA DE NOMBRES/NAME LIST

LISTA DE NOMBRES/NAME LIST

AGROCESA

NOMBRE	CARGO
Pedro Luis Camacho	Representante de ONA en el valle de San Lorenzo/Registro de Productores
Manuel Custodio Anton	Asesor FUNDEAGRO Valle Chira
Tulio Montenegro	Gerente
Alfonso Sanchez	Ingeniero

APALAM/ETASA

Asociacion de Profesionales Agricolas de Lambayeque
Agricultural Professional Association of Lambayeque/
Empresa de Tranferencia de Tecnologia Agropecuaria
y Servico de Apoyo
Agricultural Technology Transfer and Support Service
Enterprise

NOMBRE	CARGO
Juan Arbulu Huaman	Agronomo/Socio
Jorge Caicay Piedra	Socio
Wilman C. Mejia Q.	Agronomo/Socio
Robinson Monteza Ch.	Agricola/Socio/Directivo
Jose Orellana D.	Zootecnista y Maiz/Presidente
Luis Perez C.	Socio
Santiago Rodas S.	Zootecnista/Presidente APALAM
Juan Santos Alva	Agronomo/Socio
Jorge Soledi B.	Agronomo/Socio/Local Directivo

APS

Asociacion de Productores de Semillas
Seed Producer Association

NOMBRE	CARGO
Prudencio Agramonte	HOPETA
Enrique Castro	N.P. APS / Semillas de Arequipa
Hugo Gonzales	Secretario / Semillas Peruanas
Julio Gutierrez	Presidente APS / Semillas Norte Guadalupe

CAL

Comite de Arroz de Lambayeque
Rice Committee of Lambayeque

NOMBRE	CARGO
Augusto Sayan Gianella	Gerente General

CAU

Cooperativa Agraria de Usuarios La Esperanza-Huaral
Agrarian Cooperative of Users La Esperanza -Huaral

NOMBRE	CARGO
Julio Luque	Presidente

CDS

Comite Departamental de Semillas - Ica
Seeds Province Committe - Ica

NOMBRE	CARGO
Jorge Crispin R.	Representante del Banco Agrario
	Miembro
Guillermo Palomino	Miembro
Samuel Romani A.	Representante Ministerio Agricultura
	Vice-Presidente
Miguel Villanueva	Presidente

CHICLAYO

NOMBRE	CARGO
Leandro Aguinapa	Ingeniero
Pablo Arriola	Representante Comite Nacional de Productores de Arroz
Elmer Carganel	Ingeniero/Manejo de Genetica
Walter Cazarts	Ingeniero/Jefe Laboratorio Quimico y Suelos
Jose Gonzales	Ingeniero
Jose Hernandez	Director Programa Nacional de Investigacion de Arroz
Elba Llontop	Manejo Integral de Pestes/Patologia
Federico Menguillo	Ingeniero/Director Estacion Experimental Vista Florida
Julio Mondragon	Agronomo en Maiz
Orlando Montoya B.	Jefe, Seleccion PLT/ECASA

Elis Nevilla	
Luis Orbegoso UAD/MOA	Director Adjunto-Extension
Rafel Otayz	Ingeniero
Felix Quevedo	Asesor Nacional FUNDEAGRO
Jaime Sanchez de	Programa de Maiz-Genetica Produccion de Semillas
Augusto Sayan G.	Gerente General-Comite de Productores de Arroz de Lambayeque
Jesus Sotomayor	Ingeniero
Maria Elena	Ingeniera

CIPCA

Centro de Investigacion y Promocion de Apoyo al Campesinado
Research and Promotion Center for Peasantry Support
Piura

NOMBRE	CARGO
Fermin Campos	Ingeniero (granja)
Gladys Castillo	Ingeniero (Bco. Semillas)
Ricardo Pineda Milicich	Ingeniero

CODESEL

Comite Departamental de Semillas - Lambayeque
Province Seeds Committee - Lambayeque

NOMBRE	CARGO
Cesar Alva	Gerente, Semillas del Norte
Manuel Alvarado Externo,FUNDEAGRO	Ing. Agronomo, Control
Pablo Arriola	Asesor, Comite Nacional

Productor	de Arroz
Napoleon Cueva	B.S. Inspec. y C. Semillas, Ministerio de Agricultura
Julio Diaz	Asesor/ENCI
Hugo Gonzales B. Directivo, Semillas	Presidente Consejo Peruanas
Oswaldo Lescomol	Ing. Agronomo,Especialista, FUNDEAGRO
Federico Menguillo	Representante - INIAA/EEAVF
Orlando Montoya Semillas -	Jefe Planta Procesadora ECASA
Cesar A. Moyano S. Peruanas	Gerente y Socio - Semillas
Federico Scheuch	Ing. Agronomo - FUNDEAGRO
Juan Victor Velez	Agricultor Semillerista Multiplicador
Victor Vigu Diaz Chiclayo	Banco Agrario - Suc. CRSA

Comité Regional de Semillas de Arequipa
Regional Seed Committe of Arequipa

NOMBRE	CARGO
Enrique Castro Málaga	Presidente
Walter Tueros	Vice-Presidente
Adalberto Medina Vargas	Secretario
Luis Pardo García	Tesorero
Ricardo Flores Macedo	Miembro
Lesmes Camargo Salcedo	Miembro
Enrique Lozada Casapia	Miembro

Luis García Calderón	Miembro

CTTA

Comunicacion para la Tranferencia en Tecnologia en Agricultura
Communication For Technology Tranfer in Agriculture

NOMBRE	CARGO
Martha Cruz de Yanes	Especialista en Ciencia Sociales,CTTA
Raul Graham Prado	Supervisor del CTTA
Jose Ignacio Mata	Asesor AED/CTTa (Field Project Director)

ECASA

Empresa de Comercializacion de Alimentos, S.A.
Food Trading Enterprise, Stock Company
Lambayeque

NOMBRE	CARGO
Pablo Ariola	Representante del Comite Nacional de Productores de Arroz y Director futuro de Arroceros S.A.
Orlando Montoya	Jefe Encargado de la Planta de ECASA de Semillas de Lambayeque

EEA-BANOS DEL INCA

Estacion Experimental Agraria-Banos del Inca
Agrarian Experimental Station-Banos del Inca
Cajamarca

NOMBRE	CARGO
Luis Becerra D.	Coordinador de Semillas/Coordinador PIST

Alario Cabanillas C.	Unidad de Difusion Tecnica
Oscar Chacon Ch.	Bibliotecario
Luis Narro de	Director, Programa Nacional Investigacion de Maiz
Segundo Tafur S. MS	Director/Ingeniero Agronomo Fitopatologo
Flavio Valera	Coordinador PROINPIC

EEA-DONOSO HUARAL

Estacion Experimental Agraria-Donoso Huaral
Agrarian Experimental Station-Donoso Huaral

NOMBRE	CARGO
Gonzalo Campos	Director de Semillas/INIAA
Antonio Chavez	Director Tecnico Ejecutivo/INIAA
Yurio Kawagishi	Jefe de la Mision (JICA)
Gary Nunez Ch.	Director de Investigacion/INIAA
Nilda Rojas B.	Directora de Ciencias de Comunicacion/INIAA
Gerendo Salazar N.	Sub-Director Mejoramiento Genetico/INIAA
Jorge Tanaka N.	Director Proyeccion de Investigacion/INIAA
Dilma Tejada F.	Directora de Planificacion/INIAA

EACH

Estacion Experimental Agraria

Agrarian Experimental Station
Chincha

NOMBRE	CARGO
Mercedes Auris	Frutales
Richard Hilandria	Tecnico en semillas
Julian Lastra	Director
Enrique Torres	Leguminosas de Grano

EEAECH

Estacion Experimental Agraria
Agrarian Experimental Station
El Chira

NOMBRE	CARGO
Jose Morales Gonzalea	Jefe del Programa de Leguminosas (soya)
Jose Moran Mendoza	Maiz
Pedro Reyes More	Recursos Geneticos
William Wong Ato	Director EEA El Chira

EEA - Ica

Estacion Experimental Agraria
Agrarian Experimental Station

NOMBRE	CARGO
Pedro Aquige	Tecnico
Miguel Diaz Holiday	Tecnico
Albino Medina	Tecnico
Guillermo Palomino	Semillas

EEALA

Estacion Experimental Agraria
Agrarian Experimental Station
Los Andenes

NOMBRE	CARGO
Hugo Casas	Ingeniero, Coordinador de Forestales
Anibal Del Carpio	Coordinador de Cultivos Andinos
Walter Delgado	Coordinador de Maiz
Miguel Franco P.	Director Estacion Los Andes
Vladimir Jara	Coordinador de Cereales
Virginia Lama	Coordinadora de Semillas
Juvenal Ormachea	Tesista
Roberto Nina Montiel	Proyecto CCTA
Vidal Ortiz	Coordinador de Leguminosas
Miguel Pacheco	Coordinador de Papa
Jose Parra	Director Nacional de Cereales
Eric Yabar	Coordinador de Proteccion Vegetal- PROINPIC
Ladislao	Virologo

EEA-SAN ROQUE

Estacion Experimental Agraria-San Roque
Agrarian Experimental Station-San Roque

NOMBRE	CARGO
Javier Alva R.	Coordinador PIA
Sr. Canchari	Agricultor

Italo Cardama V.	Coordinador PILG
Pedro Carrasco P.	Director PICT
Carlos Cordova T.	Coordinador Oleaginosas
Julio Correa del Aguila	Director
Sr. Garcia	Agricultor
Walter Cubas P.	Coordinador PIM
Otoniel Mendoza R.	Superintendente
Hugo Villachica L.	Doctor

EEA

Estacion Experimental Agraria
Agrarian Experimental Station
Vista Florida

NOMBRE	CARGO
Leandro Aguinaga C.	Fitomejorador Semilleros Arroz
Miguel Callacna	Investigador Agrario IV
Rosa Delia Diaz	Coordinacion Crianzas
Jose Gonzales	Entomologo PROINPIC
Jose Hernandez L.	Dir. Prog.Investi. Arroz
Eduardo Jauregui	Administrador
Federico Menguillo	Director Estacion ExperimentalAgraria V.F.
Fernando Montero B.	Agronomista en Arroz
Pacian Montoya C.	Proyeccion de Investigacion
Elix Revilla M.	Fitomejorador arroz
Jaime Sanchez O.	Invest. Programa Maiz
Andres Serquen	Superintendente
Jose Soraluz Chong	Difusion Tecnica PIST

Fidel Trinidad Ll.	Enlace Convenio INIAA

EDIAGRO

NOMBRE	CARGO
Jay Barton NCSU/MIAC	Asesor en Educacion-
Jose Dance C.	Vice-Rector Academico UNALM
Manuel Fernandez A.	Ing. Agronomo
David Nunez N.	Asesor INIAA
Roque Otarola P.	Coordinador Act.3B FUNDEAGRO
Jorge Sihuay L.	DGPIST - INIAA
Silvia Solano C. FUNDEAGRO	Asistente Actividad
Americo Valdez M. INIAA	Director Editor Revista

FONAGRO

Fundacion para el Desarrollo del Agro
Foundation for Agricultural Development

NOMBRE	CARGO
Esteban Amaro	Presidente
Oliva Barrenechea	Asistente Tecnica
Ingeniero Fonlanzo	Jefe de Investigaciones y Experimentacion
Cesar Montes	Tesorero y Frutales
Alfonso Paches	Gerente
Victor Villeras	Comite de Vigilancia

FUNDEAGRO

Fundacion para el Desarrollo del Agro
Foundation for Agricultural Development

NOMBRE	CARGO
Pedro Acha Cruz	Asesor de Empresas de Semillas
Roger Arroyo	Coordinador de Investigacion
Carlos Balarezo R.	Asesor de Campo
Carlos Bohl P.	Asesor de Transferencia de Tecnologia
Julio Camminatti	Gerente de Ejecucion
Jorge Christiansen Z.	Asesor de Tranferencia de Tecnologia
Martha Chavez	
Adolfo Derteano	Director de Administracion
Pedro M. Gonzales A.	Coordinador de Semillas
Luis Mason	Director ONERO
Cesar Moran	V.AOI
Roque Otarola	Coordinador 3B
Lander Pacora	Director Ejecutivo
Efrain Palqui	Director de Programacion
Luis Pardo Narvaez	Coordinador Financiero y de Compras
Felix Quevedo	AOI
Elard Ramirez S.	Economista - Ing. Agronomo
Vicente Saldarriaga Y.	Consultor FUNDEAGRO
Federico Scheuch	Asesor de Semillas
Luis Valdivia A.	Gerente Ejecutivo Proyecto FUMD
	CIID
Ana Ma. Wiese	Coordinadora del Componente 3,

FUNDEAGRO

Junta Directiva
Board of Directors

NOMBRE	CARGO
Guillermo Burga	Director
Antonio Chavez	Director
Adrian Fajardo	Director
Gustavo Garcia	Director
Lander Pacora C.	Director Ejecutivo
Rafael Ravettino F.	Asesor Legal
Oscar Rizo-Patron	Presidente

HOPETA

COMPANIA DE SEMILLAS
SEEDS COMPANY

NOMBRE	CARGO
Jorge Jordan	Gerente Representante de Pioneer Seed del Peru
Miguel Villanueva	

IAVG

Instituto Agricola - Valle Grande - Canete
Agriculture Institute

NOMBRE	CARGO
Enrique Aguilar	Administrador
Klaus Raven	

INIAA

Insituto Nacional para la Investigacion del Agro
y Agro-industria
National Institute for Agricultural and Agro-Industrial
Research

NOMBRE	CARGO
Luis Alvarado M.	Director General de Planificacion y Presupuesto
Oscar Arroyo	National Advisor
Dante Castro	Jefe Oficina Recursos Humanos
Teresa Cochella V.	Director General Investig. Agro Industrial
Reynaldo Chacaliaza H.	Director de Contabilidad y Tesoreria
Antonio Chavez	Director Tecnico
Juan Chavez	National Advisor/Technical Coordinator Livestock Program
Lilian Chauca	Guinea Pig Improvement
Eliana Cordova de G.	Oficina Recursos Humanos
Luis Cueto A.	Director General de Investigacion Forestal y de Fauna
Guillermo Erausquin	Gerente de Ejecucion TTA
Jose Gil	National Advisor/Economics
Rosita Higaona	(Guinea Pig Program)
Alberto Huby	Director General Investigacion
Ingeniero Hugo	National Advisor/Tropical Cultivars

Rodolfo Masuda M.	Director General de Apoyo Institucional
Victor Medina	Oficina de Recursos Humanos
Juan Muscari	Animal Breeding
Angel Oviedo Aleman	Director General de Investigacion Agricola
Francisco Palomino	Integrated Pest Control
Mario Pelaez	INIAA
Marcos Saldivar	Co-Leader Guinea Pig Prod. System
Jorge Sihuay L.	Director General de Proyecto de Investigacion y Servicio Tecnico
Hugo Tejada Mercado	Director General Investigacion Pecuaria
Elya Velasco	Germplasm Collection
Hugo Yong	Oficina Recursos Humanos

INIAA/PIST

Direccion General de Proyeccion de la Investigacion y Servicios Tecnicos
Head Office for Research Plan and Technical Services

NOMBRE	CARGO
Cesar Bravo	Director Proyeccion Investigacion
Ma.Luisa Cavero	Directora de Documentacion
Manuel Fernandez A.	Director Difusion Tecnica
Jorge Figueroa R.	Especialista Transferencia Tecnologia
Alfonso Lopez A.	Director Program. Semillas
Alfredo Matos	Director Laboratorios

David Nunez	Asesor
Roger Quevedo A.	Asesor
Jorge Sihuay L.	Director General

INIAA / RADIO

NOMBRE	CARGO
Manuel Fernandez A.	Director de Difusion Tecnica
Berta LLanos	Directora de Radiodifusion
Carlos Muzarieta G.	Operador
Tomas Zevallos A.	Operador

INIAA / SULLANA

NOMBRE	CARGO
Raul Calle C.	Economista/Jefe Unidad de Investigacion Agroeconimica
Arturo Carrasco M.	Comunicador
Social/Responsable	Transferencia Tecnologia y
Difusion	tecnica
Esteban Pinao J.	Ingeniero Zootecnista Coordin. PIST/Respons.CTTA
Cesar Salcedo O.	Ingeniero
Agronomo/Coordin.Semillas	

IQUITOS

NOMBRE	CARGO
Jorge Torres Luperdi	Asesor de la Facultad de
Industria	Alimentaria

MINISTERIO DE AGRICULTURA
MINISTRY OF AGRICULTURE

NOMBRE	CARGO
Luis Nunez F.	P.Director Extension Agraria
S.Guillermo Gonzales O.	Ingeniero Agronomo
Especialista en	Comunicacion
Edwer Tapia Henriquez	Ingeniero Agronomo MS
Extencion y	Produccion
Ruth Loayza F.	Economista Agricola MS
SubDirectora	
Federico Nunez P.	Ingeniero Agronomo MS
SubDirector	de Normas y Metodos
Marcelino E. Salaverry	Experto en Pastos

MINAG-CAJAMARCA
Ministerio de Agricultura-Cajamarca

NOMBRE	CARGO
Segundo Gutierrez	Director CDR Cajamerca
Eduardo Salcedo	Jefe UCEFA Cajamarca

NCSU/MIAC

North Carolina State University
MidAmerica International Agriculture Consortium
Universidad Estatal de Carolina del Norte
Consorcio Internacional Agricola MidAmerica

NOMBRE	CARGO
Dale E. Bandy	NCSU
Jay Barton	MIAC/ISU
Joe Cortes	ISU

A.J.Coutu	TTA
W.L.Johnson	Research Advisor/Asesor de Investigacion
Fred L. Mann	MIAC/ISU (UMC)
Bill Merrill	ISU
Martin Openshaw	NCSU

ONA

Organizacion Nacional Agraria
National Agrarian Organization

NOMBRE	CARGO
Maria Abad P.	Gerente Finanzas y Planificacion
Wilfredo Caballero A.	Gerente de Ejecucion
Simon Castaneda P.	Ingeniero Agronomo/Administrador
Raul Chau A.	Gerente de Organizacion y Desarrollo
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PRICE WATERHOUSE

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SENSA - CHIRA

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Semillas Peruanas, S.A.
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