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**Evaluation of
Communications for Technology Transfer
in Agriculture
(CTTA)
(936-5826)**

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ACRONYMS

ACT Applied Communication Technology
AED Academy for Educational Development
AID Agency for International Development
ATT Agricultural Technology Development and Transfer
CEDIA Documentation and Agricultural Information Center (Honduras)
CIDA Canadian Institute for Agricultural Development
CTTA Communications for Technology Transfer in Agriculture
DAC Department of Agricultural Communications (Honduras)
FHIA Honduran Foundation for Agricultural Research
FUNDEAGRO Peruvian Foundation for Agricultural Development
GOH Government of Honduras
IICA Instituto Interamericano de Cooperacion para Agricultura
INIAA National Institute for Agricultural Investigation and Agro-Industrialization (Peru)
INIPA Instituto Nacional de Investigacion y Promocion Agropecuaria (Peru)
MOA Ministry of Agriculture (Peru)
NCSU/MIAC North Carolina State University/Midamerica International Agricultural Consortium
PIO/T Project Implementation Order/Technical
PPC/CDIE Bureau for Program and Policy Coordination/Center for Development Information and Evaluation
ROCAP Regional Office for Central America and Panama
SNR Secretariat for Natural Resources (Honduras)
TT Technology Transfer
T&V Training and Visit
USAID U.S. Agency for International Development

- S&T/ED Science and Technology, Education
- HR Human Resources
- FN Food and Nutrition
- EN Energy and Natural Resources
- ANE Asia Near East Bureau

EXECUTIVE SUMMARY

This evaluation focused on two purposes. One was to analyze the progress of the CTTA project and secondly, to look beyond the project and assess needs and opportunities for supporting more viable technology transfer activities.

The CTTA project in Honduras and Peru was plagued with financial constraints, severe political uncertainties and slow agricultural and general economic growth rates in Honduras and disaster for both growth rates in Peru.

The CTTA experimental project was not a communications project but rather a test of a well conceptualized and systematic technology transfer process. The process includes a developmental investigation; a prioritizing of communities, commodities and technologies; a validation component; a transfer strategy with multiple conventional extension and communication elements; a formative evaluation component; and continuous forms of feedback for all participants. The process integrates farmers, extensionists, researchers and communications personnel into a systematic team focusing on technology transfer. The components of the process are not new but they are down in black and white and the integration of the components is a reality.

Skepticism on finding a potentially viable transfer mode pervaded the evaluation team. The very favorable qualitative measures of output from the CTTA process changed this skepticism into a very hopeful attitude. There are positive qualitative outputs on changes in attitudes (confidence, creditability and motivation), physical results (yields and product quality) and knowledge transfers (training of farmers, extensionists, extension leaders, etc.). There is some positive evidence in Honduras for the institutionalization of the CTTA technology transfer process.

There are some limitations associated with the experiment however. The tests were made with subsistence or near-subsistence farmers and not across client groups. The output from the summative evaluation component has been minimal for reasons that extend beyond financial considerations. As a consequence, there are few quantitative measures of project output. There is also very incomplete evidence on the institutionalization process.

As one looks ahead, the focus has to be on further testing of what appears to be a favorable technology transfer process and on restructuring approaches to obtaining quantitative measures of output (productivity, net incomes, cost effectiveness, etc.). Future activities should also explore why missions are unenthusiastic and not eager to continue its funding, how the process could enhance previous African investments in farming systems, and how to cultivate World Bank interests in blending CTTA components with the heavily supported and costly Training and Visit system of technology transfer. Another critical need is for a comprehensive analysis of transfer modes relevant to developing countries that focuses on descriptive and quantitative evidence of cost effectiveness and net social as well as private benefits.

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I.

A. POLITICAL AND ECONOMIC SETTING

The two countries, Honduras and Peru, most directly involved with the CTTA project exhibit major political and economic differences.

Honduras: Throughout the 1970's real growth rates (GNP per capita) were favorable at an average in excess of 6 percent. The growth resulted from domestic industrialization, increased exports to Central America and increased investments in the private sector and from foreign assistance loans and grants.

The agricultural sector, accounting for a large share of the GNP (including agricultural production, input suppliers, food processors and distributors plus public services to agriculture) had lower real growth rates. For much of the period of the 1970's the agricultural growth rates failed to exceed the annual population rates of 2.8 to 3.0 percent.

During the 1980's real growth rates have declined. The general world recession, the oil crisis of 1979, the inability of Central American importers to pay for Honduran exports and the Nicaragua involvement explain the decline. The situation is characterized as a general recession with severe balance of payment problems, budget deficits, declining employment and increases in malnutrition.

The austerity type policies of the 1980's have focused on maintaining fixed exchange rates, low levels of inflation, lower levels of public investment with low levels of operational support for public programs. Without large infusions of foreign aid, the economy would have recorded even lower levels of economic growth.

Like most Central and some South American countries, the current economic situation in Honduras is related to an unfortunate mix of policies in place since the 1960's or earlier. In general terms these include a relative neglect of the agricultural sector, a heavy dependency on an industrial import substitution set of policies, a strong preference for price and exchange rate stability, a strong dependence on foreign as contrasted to domestic sources of investment, and an expansion of the public as contrasted to the private sector as a source of increased employment. In general these policies persist into the late 1980's, and explain low levels of economic performance.

Peru: Throughout the 1970's economic and agricultural growth rates occasionally exceeded population growth rates. In 1984 and 1985 agricultural growth rates were quite favorable but overall annual real economic growth rates were 2 to 3 percent.

In the last two to three years, there have been negative growth rates, high inflation rates that reached over 900 percent in 1988 (some estimates suggest 2,000 percent), increasing public deficits, declining public investments, substantial shifts in food consumption patterns (substitution of grains and tubers for poultry, fish and meat) and absolute austerity for all public programs.

In addition, Peru has pursued policies that have eliminated most forms of external assistance. The economic disaster in Peru is related to unworkable international financial policies, unsustainable subsidy and income transfer policies, the lack of responsible monetary and fiscal policies, overburdened levels of public employment and among others an increase in public enterprises. The dismal economic status is further impacted by actions of political groups attempting to overthrow the fragile democratic process in the country.

As in Honduras, policies relating to industrial import substitution, relative neglect of agriculture and a dependency on public versus private employment generation have confounded the present and future economic prospects.

Except for some growth in exports, including agriculture, the country is an economic disaster. In turn the political violence and resulting insecurity has led to capital flight and extremely low levels of foreign investments.

B. SALIENT PROJECT CHARACTERISTICS

The title of this project, "Communications for Technology Transfer in Agriculture" (CTTA), tends to be misleading. The CTTA concept is primarily a process of technology transfer which includes an expanded communications capacity as one of its components rather than as a conventional communications endeavor. The CTTA concept is primarily an improved application of technology transfer.

The CTTA approach is described in detail in a subsequent chapter; but briefly, includes at least the following components: developmental investigation for a set of communities, a prioritization of communities or extension agencies in the area, identification of the set of technologies most applicable to the prioritized locations, some further verification of the technologies, the design of an overall strategy for technology transfer including communications strategies, implementation of the overall strategy, in addition there are periodic formative evaluations of how the overall strategy is working, and continuous feed-back from farmers and extension agents to researchers and extension administrators which provides for adjustments to the overall strategy.

This CTTA technology transfer process has been tested in Honduras and Peru. The project was also active in Indonesia and Jordan, but there was insufficient time and resources to evaluate its effectiveness and impact in those countries. This report is restricted to Peru and Honduras.

The overall CTTA project purpose emphasized the development and demonstration of more effective communication support systems for technology transfer in agriculture. This objective embodied a recognition that while most transfer (extension) systems included some communication components, they were not an integral part of the overall technology transfer mode. The challenge was how to increase the complementarity of the communication processes in technology transfer.

The CTTA technology transfer process is not new. However, the process

brings a systematizing of critical elements, provides a workplan for extensionists and researchers, provides mechanisms for ready adjustments to a chosen strategy in response to variable and changing conditions, as well as adding an orderly process for technology transfer.

Another project aim was institutionalization of the transfer process. An important institutionalization characteristic was collaboration with an existing institution, not creation of yet another public entity. Institutionalization was to focus on the transfer and acceptance of a conceptualization of the transfer process, including training of extension and communication personnel, to assist in some capitalization and to disseminate the consequences of enhanced technology transfer.

The CTTA, as an experimental project, also included a summative evaluation component. At least three dependent or output variables were the focus of attention. These included measurement of changes in: attitudes by farmers and extensionists, productivity and farm income, capacity or knowledge of individual farmers and extension agents relating to technology, and institutional capacity to organize, implement and manage the technology transfer process.

Two additional project design characteristics are salient. One relates to how the transfer process accommodates variability and the other to linkages with input suppliers.

Accommodating variability requires knowledge of physical differences (micro-climates, soils, etc.) among locations, socio-cultural differences, variations in risk aversion and related client group characteristics. The project design allowed for accommodating variability in identifying appropriate technologies to be transferred, in adapting communication modes and in continually evaluating the effectiveness of transfer modes as related to site variability.

The project also was designed to collaborate with input suppliers. In both Peru and Honduras the input suppliers were predominantly public enterprises. Given private sector involvement in input markets, collaborative activities with such firms and the CTTA process would be relatively easy. The complementarity of interests are very evident. Such actions would include fertilizer, chemical supplies, certified seed associations, veterinary input suppliers and general livestock services such as artificial insemination. Communication modes were to be structured with input suppliers of seeds, fertilizers, chemicals, etc. To date, however there appears to have been very modest involvement with input suppliers in the CTTA process.

C. EVALUATION METHODOLOGY

A special feature of this evaluation related to the limited time spent in two project locations. In both Honduras and Peru the three person team (see Appendix B) spent only one week in each location.

Due to travel restrictions in Peru, the team did not visit the Huaraz site but did bring farmers and extension personnel to Lima. The team also interviewed the leader of the project from Puno but again by arranging a

visit to Lima. In Honduras two team members visited the primary CTTA site at Comayagua as well as two communities served by San Luis extension agencies. In addition the team met with extension agency personnel from Olanchito. This agency was adapting the CTTA process in collaboration with project personnel but funded from non-project resources.

In addition to those visits and direct interview opportunities, the team conducted many other interviews. These included meetings with project personnel, AID officials, ministerial officials, Peruvian INIAA extension transfer directors, agency extension directors and previous extension directors, foundation (FUNDEAGRO) leaders in Peru, collaborating NCSU/MIAC colleagues in Peru, agricultural communication leaders at the agency and national levels, scientists and research directors in both countries, selected leaders of programs to develop private extension organizations and selected leaders of various organizations not directly connected with the project (see Appendix C). As is the usual event, exit conferences were held in Peru and Honduras with USAID officials. In addition, the team met with S&T and regional bureau representatives to discuss findings and possible next steps. These efforts were complemented by visits with project personnel in Washington, both prior to and after field visits in Peru and Honduras.

The team was more than well supplied with reading materials. These ranged from pre-project papers to the project paper, to specific project design documents, to quarterly reports, to formative and summative design papers, and to extension materials and other documents including some drafted for the evaluation by project personnel (see Appendix D).

II.

A. PROJECT IMPLEMENTATION CHRONOLOGY

The antecedents of the CTTA project date back to April, 1983 when USAID/Honduras and the Honduran Secretariat of Natural Resources (SNR) jointly sponsored a three-day seminar on Agricultural Communications for government agencies involved in technology transfer to farmers. The seminar created considerable interest in the direct involvement of communications personnel in the technology transfer process. As a follow-up, in March, 1984 Dr. Howard Ray (AED) led a USAID/Honduras funded assessment of the state of agricultural communications in Honduras. The assessment report led to the establishment of the Department of Agricultural Communications in the SNR which reports directly to the Secretary and formerly had been a part of the Directorate for Extension.

Concurrent with these developments in Honduras, Dr. Anthony Meyer, S&T/ED, was working on the development of the CTTA project in AID/W which was approved in April, 1985. AED was contracted by AID/W to implement the CTTA project in September, 1985. A project team, headed by Dr. Ray, then developed an implementation plan for the pilot effort, selected a project site and negotiated a Letter of Understanding between USAID/Honduras and the SNR.

The new Honduran government, elected in November 1985, ratified the draft Letter of Understanding in March, 1986. Comayagua was picked as the pilot project site. Representatives from the SNR visited Washington in August, 1986 to meet with AED and AID/W personnel and to interview candidates for the field director position. Beginning September 1986 the SNR team accepted Valerie Barzetti for a short (four month) assignment as field director, pending identification and contracting of a more experienced person. She was joined by three short-term advisors to work on the identification of appropriate agricultural technologies, the developmental investigation and establishment of the Comayagua office and staff. Dr. Milton Munoz replaced Ms. Barzetti in February, 1987 as the resident project advisor.

The following presents a brief overall chronology of the CTTA project.

1. Project agreement was signed on April 15, 1985 scheduled for the period 1985 to 1992.
2. Implementation was initiated at the primary site in Comayagua, Honduras in September, 1986 under a program director appointed by AED.
3. Implementation at Comayagua started with three extension agencies in September, 1986, by November, 1987 five extension agencies were added and by March, 1988 five additional extension agencies were part of the experimental program.
4. Evaluation activities were initiated in Comayagua on May 1, 1987 and the first round of data had been collected by December 31, 1988 under a sub-contract with Applied Communication Technologies (ACT).

5. Implementation in Peru was plagued by political instability but the project was initiated in Huaraz in January, 1987. A developmental investigation was conducted in Huaraz in February, 1987 and the first formative evaluation in June, 1987.
6. Implementation of project activities in Puno, Peru were initiated in June, 1988 and funded by two external donors. The Puno activities involve eleven communities with the process being tested in eight, with three others as controls. The developmental investigation was completed in November, 1988.
7. About the same time, November 1988, project activities were initiated in an extension agency in Chiclayo and the developmental investigation was initiated in December, 1988.
8. Implementation of a modified version of the CTTA process was initiated in the Jordan Valley and in a Jordanian Highlands project in October, 1987 and terminated in late 1988.
9. Implementation of the communications media component of the CTTA process was initiated in Indonesia in October, 1987. The project is continuing but is not a complete test of the CTTA process.
10. Two exploratory studies on the application of the CTTA process were conducted in Senegal in 1987 and in Niger in 1988.

B. SPECIAL CONDITIONS

The relatively poor economic status and increasing political instability in Honduras along with an economic and political disaster in Peru do not provide hospitable conditions for any development project. These economic and political conditions raise serious issues associated with the implementation of CTTA and the prospects for its institutionalization.

Moreover, the CTTA project was designed at a time (1984 and 1985) when the financial crunch of AID had not expressed itself. The project design included an eight-year time frame, a primary site in Honduras and eight collaborating sites with scheduled funding of \$19.5 million. Funding arrangements involved three units within the Science and Technology Bureau (Education, Rural Development and Agriculture) plus mission buy-ins where the CTTA concept was to be tested. Post-1985 funding restrictions have resulted in diminished levels of activities within the primary site in Honduras; a reduced scope of work for a collaborative site in Peru, plagued by political violence; a sharp cut-back in home office involvement; and only partial collaboration for two sites in Indonesia and Jordan. As of April, 1989 about \$7.3 million has been obligated for the project.

There are other special conditions relating to the CTTA project. The three conditions discussed below relate the project to the broad goals of an agricultural science development strategy, to the essential components of such a science-based strategy and to the interface of the CTTA project with the previously funded AID projects in Farming Systems and Interpaks.

The targeting of CTTA to subsistence or near subsistence producers in Honduras and Peru raises a number of issues. The chosen clientele for the project face severe poverty conditions (limited resources, low real incomes, low nutritional levels, etc.). There are other agricultural client groups that are substantial contributors to increased economic growth rates, that produce the market surpluses to feed increasing urban populations, that produce the food and fiber exports that yield foreign exchange and that produce raw materials for indigenous manufacturers or contribute to import substitution strategies. There is a special concern over the applicability of the CTTA process to these other client groups in that such groups usually require more complicated technologies, have substantially different levels of education, and are more involved with input and product marketing firms. The relatively simple technologies under study in Peru and Honduras may not be typical of the needs of other client groups.

A second special condition focuses on the CTTA process as only one of many components in an agricultural science-based developmental strategy. The other components include the development of new knowledge of things and their uses (research beyond simple adaptation); an educational component relating to training farmers, scientists, transfer agents, administrators, business leaders, etc.; also included are components that relate science to factor marketing firms as well as to product marketing firms (assembly, storage, food processing, distribution, etc.); a final component relates to the development of a rational set of agricultural policies. All of these components, including the technology transfer component, involve many private and public institutions as well as processes for integrating actions among and within components.

Clearly, the CTTA, to date, has focused on only one component (technology transfer) and has concentrated on only one client group among many in a science-based strategy. In Peru the CTTA project focused on near-subsistence farmers while in Honduras the focus was on small farmers with some marketable surplus.

Another special condition concerns the interface of the Farming Systems and the Interpaks projects, funded by AID/Washington. There are selected aspects of farming systems (diagnostic developmental investigation, adapting technologies and feedback processes) involved in the CTTA process. However, because the systems project was discontinued, more direct linkages were not possible.

Clearly much of the philosophy and process of the Interpaks project are not woven into the CTTA process. Notably, the concern for rational policies and the institutionalization process of Interpaks was not evident in the written or observed process of CTTA.

C. PROJECT FUNDING

An estimate of the obligated funding is shown in Table 1. For the total project through FY 1989, a total of \$7.3 million has been obligated or plans exist for their obligation in FY 1989. The pilot sites have received 78 percent of the funding with the balance for home office operations.

Table 1: Summary of Programmed versus Obligated Funding for CTTA by Location and Source through FY 1989.

Location	Programmed ^{1/}			Obligated ^{2/}			
	S/T	Missions	Total	S/T	Missions	Other	Total
----- (\$000) -----							
Honduras	1,400	1,300	2,700	930	285	845 ^{3/}	2,060
Peru	400	400	800	410	410		820
Other Sites	3,600	6,900	10,500	120	2,383	341 ^{4/}	2,844
Home Office	1,700	990	2,690 ^{5/}	1,537			1,537
Total			16,690 ^{6/}	2,997	3,078	1,186	7,261

^{1/} Source: Illustrative budgets in the project paper.

^{2/} Obligated and planned through FY 89.

^{3/} This amount was designated for FHIA through Cornell University.

^{4/} Note allocations in Table 2.

^{5/} Estimated from illustrative budgets in the project paper.

^{6/} Contingencies and inflation not included, the programmed total was \$19.4 million with \$7.3 million planned from S/T and \$12.1 million planned from missions.

Table 2 provides a detailed account of the sources of funds obligated to the project. Note that of the obligated amount as of April, 1989, some 42 percent is from Mission, 41 percent from the Central Bureau and 17 percent from other sources.

Table 2: Sources of Obligated CTTA Funding by Location and Year.

Sites	Years					Total
	1985	1986	1987	1988	1989	
----- (\$000) -----						
<u>Central</u>						
S/T	722.3	685.0	540.0	650.0	400.0 ^{1/}	2,997.3
<u>Missions</u>						
Honduras/SNR					285.0 ^{2/}	285.0
Peru		150.0	120.0	140.0		410.0
Indonesia			10.0	2,072.7		2,082.7
Jordan				300.0		300.0
Sub-Total						
<u>Others</u>						
Specials S/T						
(Tech ID for Africa)		46.0				46.0
Honduras/FHIA	250.0	250.0	250.0	95.0		845.0
Indonesia		3.0				3.0
ROCAP (regional network)			11.0			11.0
ROCAP Conference ^{3/}				100.0		100.0
CDIE (Bogor INstitute of Ag./Indonesia)			13.7			13.7
ANE/TR (Site Dev., Asia/Near East)			50.0			50.0
S/T (RD-Innovation Activity in Africa)			100.0			100.0
USAID/Sri Lanka				17.7		17.7
Subtotal	250.0	299.0	424.4	117.7		1,186.4
Total	972.3	1,134.0	1,094.7	3,375.4	685.0	7,261.4

^{1/} At this time, S/T Education and S/T Rural development have obligated \$225,000 and \$175,000, respectively to CTTA.

^{2/} This includes \$95,000 for FHIA and \$35,000 for the SNR for CTTA.

^{3/} Designated to AED for developing a regional conference on technology transfer. This has been an on-going effort involving IICA and others with a scheduled conference in November or December, 1989.

The data in Table 3 attempt to summarize actual obligations through April, 1989. As stated in Section II.8, there were drastic reductions between the project paper stage and actual expenditures for the total project. There was roughly a 60 - 65 percent budget reduction over the period 1985 to 1989. The obligated amount through June, 1990 of \$7.3 million represents but 36 percent of the programmed \$19.4 million.

Including the year 1989, obligated amounts totaled \$7.3 million from 1985 to June, 1990. Actual expenditures through April, 1989 are substantially below the obligated amounts. Clearly there is a large amount in the pipeline which suggests an opportunity to re-budget some of the obligated funds to respond to some of the recommendations in Sections IV and V.

Table 3: A Summary of Project Obligations by Contractors and Locations.

Locations	Contractors			Total
	AED as of 6/30/90	ACT as of 12/31/88	Cornell as of 9/30/88	
----- (\$000) -----				
Honduras CTTA	1,177.0	339.2	.1	2,060.0
Honduras FHIA		.1	543.6	
Peru	637.4	144.0	38.6	820.0
Indonesia	2,808.1	.8		2,844.0
Jordan		35.1		
Home Office	1,139.1	226.9	171.0	1,537.0
Total	5,761.6	746.1	753.3	7,261.0

As is known, the AED was the prime contractor with two sub-contracts. One was to ACT for the summative evaluation and another to Cornell University for assisting in communications strategies. The data in Table 3 summarize planned and utilized expenditures by contractor by locations.

AED has executed over \$5.7 million or 79 percent of the obligated amounts. In Honduras the majority of the field expenditures by AED have been to develop the CTTA process. Again it is not clear how much of the expenditures in Indonesia and Jordan relate directly to the CTTA process.

The sub-contract to ACT focused on the summative evaluation. The obligated amount of \$746,000 represents about 50 percent of the original project paper estimate. As of December 31, 1988 the prime contractor suspended all financial support for ACT.

The Cornell University sub-contract was designed to assist FHIA in Honduras and to assist the development of communication strategies in Honduras, Peru and other sites with an emphasis on Asia. With FHIA, the university focused on developing a communications unit and its communications strategy and on building an endowment for the foundation. Project resources were expended for FHIA assistance in both the communications and endowment development. The sub-contract was suspended as of July 1, 1988.

D. TECHNICAL ASSISTANCE

As with the funding analysis, financing methods and budget reductions required substantial departures from original estimates of the level of technical assistance. Table 4 data are not complete but the relevant comparisons are executed against adjusted levels of effort.

For Honduras and Peru on the implementation component, the executed amounts of technical assistance, both long- and short-term, represent about 75 percent of the adjusted levels. Approximately 72 percent of the long-term and 72 percent of the adjusted short-term levels have been executed.

At other sites, there are large gaps on both long- and short-term technical assistance levels of executed against adjusted amounts except for the Cornell University assistance to FHIA.

With respect to the evaluation component, given the incomplete data set, the aggregate executed levels exceed the adjusted levels. However, as shown in Table 4 the evaluation sub-contract with ACT on evaluation originally programmed over 275 person months. This level of effort was drastically reduced and assignments shifted. However, as of early 1989, the ACT evaluation unit had implemented 91 person months of assistance with 43 months of long-term assistance in Honduras and Peru along with another 14 person months of short-term assistance in the same countries.

The data on the level of effort for the other sub-contract with Cornell are very incomplete. The general view is that the programmed assistance to FHIA has been completed. However, the uncertainties over future activities for FHIA, including the communications component, raise doubts about how effective the CTTA project and its institutionalization in Honduras has been. Clearly, the relationship of the communications component of FHIA to national efforts on adapting the CTTA process are highly uncertain.

Table 4: Summary of Technical Assistance Programmed versus Executed for the Period 1985 - 1992.

Type and Location	Programmed		Executed as of April 1989 ^{3/}
	Initially	Adjusted ^{2/}	
Implementation:			
<u>Long Term:</u>			
	----- (Person Months) -----		
Honduras/SNR	102.0	48.0	34.0
Peru	42.0	42.0	30.0
Other Sites	264.0		
Jordan		36.0	14.0
Indonesia		340.8	67.0
Honduras/FHIA		48.0	48.0
Home office	336.0	n.a. ^{4/}	154.8
Sub-total	744.0	514.8	347.8
<u>Short Term:</u>			
Honduras/SNR	37.0	10.0	6.0
Peru	8.0	6.0	8.0
Other Sites	38.0		
Jordan		220.0	1.5
Indonesia		38.0	6.8
Honduras/FHIA	2.0		
Home Office	88.0	n.a.	n.a.
Subtotal	173.0	274.0	22.3
<u>Subtotal: Implementation</u>			
Long-term	744.0	514.8	347.8
Short-term	173.0	274.0	22.3
Total	917.0	788.8	370.1

1/ Estimated from the project paper.

2/ Adjusted as budgets were reduced.

3/ Estimated by AED.

4/ Figures not available.

Table 4: (continued)

Type and Location	Programmed		Executed as of April 1989 ³
	Initially	Adjusted ^{2/}	
EVALUATION:			
<u>Long Term:</u>			
	----- (Person Months) -----		
Honduras	48.0	24.0	19.0
Peru	0.0	24.0	24.0
Other Sites	0.0	0.0	0.0
Home office	195.0	0.0	34.0
Sub-total	243.0	48.0	77.0
<u>Short Term:</u>			
Honduras	5.6	10.0	10.0
Peru	3.5	4.0	4.0
Other Sites	34.5	n.a. ^{4/}	n.a.
Home Office	0.0	0.0	0.0
Subtotal	33.6	14.0	14.0
<u>Sub-total: Evaluation</u>			
Long-term	243.0	48.0	77.0
Short-term	33.6	14.0	14.0
Total	276.6	62.0	91.0

1/ Estimated from the project paper.

2/ Adjusted as budgets were reduced.

3/ Estimated by AED.

4/ Figures not available.

III. DESCRIPTION OF PRIMARY PROJECT COMPONENTS AND OUTPUTS

A. Description of the Project Process

It is the belief of the evaluation team that the CTTA project was not able to generate the hoped-for level of interest or support within AID because it was perceived as a traditional agricultural "communications" project, i.e., one which promotes the use of print and broadcast media in the transfer of agricultural technology. What we found is that the project, as implemented in Honduras and Peru, is much more than a "communications" project. It has succeeded in developing a systematic process for the transfer of agricultural technology which is farmer-client group sensitive, integrates research and extension, provides for a high degree of farmer participation, utilizes existing personnel and resources in an orderly manner and inspires a surprisingly high level of motivation and enthusiasm among project participants.

The process includes the following steps:

1. Investigation: The first step in the process is a developmental investigative effort which involves the following steps.

a) An analysis of the client groups to be served -- where they live and how they are organized, what they grow, the levels of technology that they employ, the problems that they are encountering in crop production, their social, economic and cultural characteristics; their preferred modes for receiving information;

b) The identification of available improved technologies are compared with views of the farmer-client group to determine if they are suitable for the conditions faced. This comparison may suggest additional adaptation of known technologies and involves looking at the costs and the economic benefits that might be derived from use of the technology, the ease of application and the risks involved, especially for low resource farmers;

c) Gathering information on agricultural sector support systems to determine if the inputs, credit, marketing and other goods and services required to enable the farmer to adopt the technology are or can be made available in an adequate and timely fashion.

2. Planning and Strategy Development: The information collected in the investigation phase is used to develop a strategy which identifies and prioritizes the farmer communities, crops and technologies to be included in the technology transfer program. A comprehensive communications strategy outlines the media to be used which includes interpersonal communications by extension agents, graphic and print media (manuals, posters, leaflets) and radio broadcasts. A procedure is developed for breaking down the technologies into easily understandable messages which are geared to the agricultural calendar.

3. Validation: Both the technologies and the mass media messages are tested at the farmer level to assure that the technologies are appropriate and to determine how well the messages are understood, their acceptance by farmers and the degree to which they are able to convince the

farmer to utilize new technology.

4. Production and Distribution: Once the technologies and messages are validated, the printed materials and radio programs are produced for mass diffusion. The production process is directly tied to the agricultural calendar to assure that messages reach the farmers in a timely way. Printed materials are distributed by extensionists through diverse channels such as community leaders (teachers, mayors, nurses, etc.) and farm supply stores. The same technologies and messages are transmitted by the extension agents, the printed media and the radio broadcasts so that they reinforce one another.

5. Formative Evaluation: The CTTA process emphasizes the need for periodic evaluations to determine: whether messages are reaching the farmers as planned; which channels are being used; which messages are being assimilated and which need reinforcement; which technologies and behaviors are being adopted, how they are applied and with what results; and, how farmers' attitudes and willingness to take risks are being changed. The formative evaluation is intended to provide fast results for immediate decision-making. For that reason, it tends to use methods that are affordable and quick rather than rigorous or precise. The formative evaluation is part of ongoing project management.

6. Continuous Monitoring: Throughout the process, there is provision for continuous monitoring to be able to act quickly in the event of unforeseen problems. This provides a permanent feedback system between farmers, extensionists, researchers and other public and private sector officials.

In the pilot effort in Comayagua, Honduras, the various steps in the process were carried out at the extension agency level by a team composed of the agency director, one or two researchers, one or two extensionists and a social promoter. The agency team was assisted by the Regional Communications Unit which was composed of an agricultural engineer as Chief, a journalist, a photographer, a draftsman, a library assistant and a secretary.

For basically the first time, public sector research and extension personnel worked together to find out what kinds of production problems were bothering farmers, what levels of technology they were using, and what kinds of technology would be appropriate for their circumstances. The pilot effort started in three agencies serving a total of 2,500 farmers. A sample of 350 farmers was drawn from census lists and the technology identification and a developmental investigation were completed by the agency team. The next step was the development of an extension/communications strategy which identified priority groups of farmers, priority crops, the technologies to be transferred and the channels that would be used for getting the information to the farmers. A similar plan was prepared which prioritized research activities based upon farmers' needs.

As logical and simple as it seems, this CTTA approach was a major departure from the way that research and extension had traditionally been carried out in Honduras. The traditional approach was for the SNR Research Department to establish its own research priorities with no direct reference to the perceived needs of farmers. Research Department personnel

carried out adaptive research at the experiment stations, regional trials at experiment stations and on farms, and validation trials on farmers' fields with almost no involvement of extensionists or farmers -- for the on-farm trials the farmer provided the land but the researchers did everything else. This gave the farmer no sense of participation or ownership. The technological packages were then "turned over" to the extensionist for "transfer" to farmers.

Extension program targets were set at the central level of the Secretariat of Natural Resources -- usually the number of hectares by crop to be "covered" by each Regional Directorate and extension agency. It was then up to the Regional Director and Agency Director and often the individual extensionist to decide how to "cover" or transfer technology for the assigned area. This resulted in ad hoc, uneven technology transfer with a multiplicity of approaches and messages, many of them in conflict.

The process introduced by the CTTA project fostered close collaboration between the researchers, extensionists, communications personnel and farmers beginning with the investigation phase to determine farmers' problems and levels of technology. The technologies selected for transfer directly addressed farmers' needs. The validation of the messages assured that they were appropriate for the target audience and reinforced each other. The formative evaluation and continuous monitoring adjusted the program to deal with any unanticipated problems.

Outputs:

The strong points of the approach are: It serves as a mechanism to integrate research, extension and farmer client groups into a cohesive, functioning system; it is very client-group sensitive, responding to needs identified in the investigation phase; it provides for a high level of participation by farmers; it makes rational use of existing resources supplemented by modest levels of operational support; it takes a set of previously uncoordinated activities and puts them in an orderly sequence; it gives all participants a clear sense of program objectives and their role in achieving them; it achieves a high level of motivation and enthusiasm on the part of all those involved.

The experiment called for the output of the CTTA process to be evaluated in at least three ways. These included changes in attitudes, transfer of knowledge (changes in capacity) and changes in physical output (yields, net farm income, etc.). There has been no analysis of the output measures in an organized quantitative manner.

However, the team accumulated qualitative data which supports a very optimistic impression of the technology transfer process. Attitudinal changes relating to changes in confidence by farmers in extensionists was frequently expressed by farmers. These were the same extensionists that farmers previously complained about in terms that they seldom visited the community, had conflicting messages and generally displayed little interest in their work.

There also appeared to be changes in credibility among farmers and extensionists in governmental commitment. Knowledge that was reliable was being transferred and within even a single cropping cycle began to yield

positive results.

There have been changes in motivation among all process participants. It appears that motivational changes are related to the fact that the process produces increased self-esteem for a lot of people. They are given a vision, there are no empty promises and knowledge transfer produces visible results.

Changes in capacity involved training sessions with farmers, extensionists, extension leaders and agency communications personnel. There were frequent training sessions and very glowing reports on the content and value of such efforts.

The reported changes in yield come from recall of a small group of farmer experiences and no effort has been made to evaluate net income changes. There were reports of significant yield increases, particularly in rice, resulting from the use of improved seed and cultural and fertilization practices. A reform sector group in San Luis, Honduras reported increases in rice yields from 2.0 MT/ha to 5.2 MT/ha. A farmer in Esquias, Honduras increased his yields from 1.7 MT/ha to 5.0 MT/ha. Potato yields among collaborating farmers in Peru went from very low to medium per hectare with major improvements in quality. A few farmers reported similar yield changes in soft corn production.

Extension leaders in Honduras and Peru had very favorable comments. One very experienced extension director in Peru commented, "This system confirms many things that extensionists knew but such knowledge was not put down in black and white." Another extension director in Honduras added, "Anyone who has seen the results wants to participate." There were many such comments but one final one by the technical director of INIAA in Peru should be added. "INIPA's (now replaced by INIAA) experience was that under T&V methods, only 5 to 10 percent of the farmers could be reached directly, but with CTTA you can reach 30 to 40 percent."

A principal drawback of the approach is: its inability to deal with some of the major problems affecting the agricultural technology system in Honduras and Peru, e.g.: the high degree of politicization within the Honduran Secretariat of Natural Resources; the inability to attract and retain technically qualified personnel because of the uncertainties inherent in the SNR's employment practices (i.e. large numbers of contract personnel who are not sure whether they will be paid until six or eight months into the year, the high turnover of personnel when political administrations change); the discontinuity caused by the high rate of turnover of personnel; the low salary levels in Peru which contribute to high levels of moonlighting and personnel turnover; the economic crises faced by both countries, with resultant budget uncertainties and short-falls.

B. AN ELABORATION OF COMPONENTS AND OUTPUTS OF THE CTTA PROCESS

The central component of the CTTA is indeed "Communication" but communication with a capital "C" rather than a lower-case "c". Or, put another way, Communication versus communications. The latter term denotes the actual media, messages, and communications strategies designed and implemented by the project, while the former highlights the much broader

action of on-going, interactive dialogue among all the critical players in a technology transfer (TT) system: farmers/producers, extensionists, researchers, and communicators.

While some earlier models of TT have paid lip service to the need for dynamic dialogue (i.e. Communication) among these players, CTTA has built and tested a methodology that actually operationalizes this model. Moreover, as interviewees with decades of research and extension experience in both Honduras and Peru emphasized, this methodology is not entirely new but rather gives fresh order and meaning to previous approaches involving farmers, researchers and extensionists, with communicators now serving as "brokers" who tie these units together within a true system of technology design, development, and diffusion.

To give just a sampling of the extensive commentary in this vein, as a high-placed SRN staffer observed, "For many years the government of Honduras has been unable to organize its agricultural research and extension systems. ...There was total pandemonium. ...With the institutionalization of the unified methodology...CTTA will be fundamental for the future of agricultural development in Honduras." And from a USAID/Honduras administrator, "The 'harmony' between the CTTA approach and the structure and needs of the agricultural establishment in this country is impressive."

Similarly, in Peru a longtime INIAA/INIPA staffer explained, "CTTA... makes a team out of farmers, researchers and extensionists." INIAA's technical director noted that, "CTTA represents a way to systematize our work."

Field-level extension personnel in both countries emphasized the clear sense of purpose and organization that this approach has brought to their work. Others commented on the goal direction they felt it provided, and on the "new understanding," "cohesiveness," and "recognition of mutual responsibilities" that it has engendered. As one man summed up, "This methodology works for everyone."

The apparent success of this project and the enthusiasm it has generated among all players in the public agricultural technology system of Honduras and Peru is both explained and illustrated by reference to four key components of the CTTA approach: a fundamental emphasis on farmer participation; tight integration of researchers, extensionists and farmers; design and utilization of extremely client-sensitive communications strategies; and continual attention to monitoring and feedback mechanisms.

Farmer Participation

Farmer participation is the core of the CTTA process. While other models give rhetorical importance to this element, the Honduras and Peru projects have actually operationalized it as both the beginning and iterative end-point of the technology transfer process.

Farmer participation begins in the diagnostic investigation where, as members of a Comité Agrícola interviewed in Honduras pointed out, "For the first time, someone asked us what our problems were; before this, we thought that our government was deaf."

After problems are prioritized with farmers and potentially appropriate technologies are selected in consultation with researchers, producers then participate in validating the technologies. This is accomplished through in-depth interviews and focus groups, and then through on-site farmer or cooperative-managed experiments. This process often leads to innovative adjustments in the application of the technology so as to give it a better "fit" with producers' economic, social, and cultural realities. An instructive case example follows:

Transferring Planting Techniques for Maize in the Andes

CTTA diagnostic work revealed that most Huaraz farmers were unaware of the benefits of controlled spacing and plant densities for maize. Planting is traditionally done by women, who follow along behind the plow, dropping a continuous line of seeds. The team recommended that farmers planting by hand, drop three seeds into carefully spaced pockets made with a spade. Some researchers indicated that this technique alone could increase production by 15 percent.

Participating producers noted a number of drawbacks to this recommendation, however. For one thing, people were unfamiliar with the metric system in which researchers and extensionists measured distance. More serious, the proposed technique embodied the back-breaking work of repeatedly gouging out pockets and then bending over to seed them (an estimated total of some 21,000 times in order to sow a single hectare). Equally important, such heavy work would have to be done by men. Yet throughout the Andes, a profound ideological analogy between female fertility and agricultural productivity stipulates that women must sow the seed.

Based on these inputs from participating farmers and further consultations with researchers, the technology recommendations were revised and a creative compromise was struck. Men continued to plow and women to plant, but with a difference. Women now carried a light staff cut to the exact distance for spacing between plants, which they laid down as they proceeded, carefully dropping only three seeds at each interval.

Once a technology is validated, the next step is to design and test effective and intelligible communications strategies to extend it. Farmers are necessarily key participants in this process, too. Via focus groups, surveys, in-depth interviews, consumer panels, etc. they critique every aspect of the print and broadcast media under preparation. In radio broadcasts, their voices and views are often incorporated directly into programming. Even after CTTA media are put into play, farmer reactions to them are continually monitored and assessed via formative evaluations; and refinements are made to the communications strategies as needed.

Further, producers also participate in the broader dissemination of media and information, as they share and discuss materials and broadcasts with peers. Likewise for technology diffusion. Whether as demonstration farmers or merely as enthusiastic practitioners of a new technique, farmers are the single most credible source of agricultural information among their peers.

Indeed, in both Honduras and Peru, participating families and communities have been approached by neighbors who want to learn how they, too, can join in and benefit from the CTTA process. For example, stimulated both by radio broadcasts and by firsthand observation of improved technology in action, 13 other communities have sought out members of Comunidad Recuayhuanca (one of the CTTA/Peru sites) to inquire how to obtain CTTA courses and publications. This kind of burgeoning popular demand and appreciation for public extension services is directly linked to the fact of producer participation in the technology development and transfer process.

Research, Extension, and Farmer Integration

Research. Interviewees in both Honduras and Peru described a long history of duplication of research and/or a proliferation of research and development projects. Because the CTTA promotes communication across the agricultural technology system as a whole, many interviewees opined that, along with some institutional restructuring, the CTTA approach constitutes an important tool for confronting the common problem of research fragmentation and the concomitant dissipation of scarce human and financial resources -- what one Honduran scientist termed "random research."

As noted throughout this report, the CTTA approach is grounded in a diagnosis of producers' present agricultural knowledge, practices, and perceived problems. Working from this diagnosis represents one of the principal ways that research, farmer, extension and communications integration is achieved. Research attention is directed to and focused on concrete research questions and problems that are immediately relevant to the needs and goals of specific producer groups within a nation, as enunciated in the diagnostic studies ideally conducted jointly by researchers, extensionists and communicators with farmers.

With the CTTA process, the developmental investigation in particular has a number of beneficial effects on research. As one highly placed member of INIAA quipped, "Too many of our scientists think they are in the First World when it comes to designing technology suitable for the socio-economic realities of the Third World. "We need to get our feet on the ground." Another added that such participative developmental diagnoses make researchers aware of an important need within the agricultural science system as a whole: to provide a broad selection of technologies, not just technological "recipes" that may or may not fit a given clientele's circumstances.

Still other research benefits of the CTTA process were cited. As INIAA's research director observed, appropriate technology often does exist, but it simply has not been reported or communicated. He noted that CTTA has encouraged scientists to do a better job of reporting their findings instead of "just leaving them in their desk drawers." At the same time, it has heightened awareness of possibilities for adaptation of "shelf" technology. This has come about because now, researchers interact more directly with extensionists and communicators, who "lay concrete demands before the researchers," based on the developmental investigations among farmers. Numerous interviewees also noted that CTTA has increased direct interaction between scientists and farmers through increased on-

farm interviewing and research via CTTA teamworking. As one Honduran scientist summed up, "CTTA shook us awake and gave us a new light by which to guide our research." A particularly eloquent mini-case from Peru aptly illustrates this "awakening."

Combating Papa Kuru, in Peru

One of the principal potato pests throughout the Andes is papa kuru (Quechua for 'potato worm', Spanish 'gorgojo de los Andes,' Preynnotrypes sp.). The larvae of these species tunnel into and feed upon the potato tuber. This causes losses not only in crop bulk, but also in crop quality. The galleries left by the larvae's feeding are filled with the insects' feces, thus rendering the potatoes inedible either by human beings or animals and naturally destroying the commercial value of the crop. The problems do not stop there, however. The larvae also transmit a potato virus; and the adults feed on the leaves (cf. Quispe Caceres 1987).

Of course, technology exists to combat this common plague. But as the CTTA team soon discovered, the standard recommendations involved applying pesticides which virtually none (in the case of Ambush) or only a few (Sevin 85PM or Dipterex, combined with Gusathion) of the producer clientele could possibly afford, not to mention the additional cost of a backpack sprayer (1/100,000 in 1989).

CTTA personnel thus returned to researchers to inquire what alternative technologies might exist to meet the needs of less wealthy producers. Based on the project's diagnosis of farmers' current practices and on the concrete problem definition of finding no- or low-cost ways to attack papa kuru, one outcome of this dialogue among the team was that researchers recalled a near-forgotten technique, one so simple that they had not thought it required extension until they were informed that producers did not know it.

This "forgotten" technique consisted merely of better land preparation by plowing three times at certain intervals, instead of just one time, before planting. Each plowing unearths more of the noxious larvae, exposing them to the merciless frosts and the intense high-altitude sun of the Andes, and to the voracious appetites of birds.

Along with other recommendations for field cleaning, weed control, and crop rotations, researchers recalled yet another simple, low cost technique to combat the ubiquitous papa kuru. This involved higher hilling around the base of the potato plant, so that the adult insect cannot deposit its eggs close to the tubers.

When these two techniques were communicated, they were readily accepted by producers at all economic levels, despite the extra labor entailed. At the same time, researcher were stimulated to elaborate still other recommendations involving the use of less expensive commercial pesticides (Gusathion and Volaton) for producers with some capital to invest in their potato crop.

Moreover, working together, the team devised a creative, cost-effective way to apply pesticides with paint brushes rather than expensive sprayers. Finally, where necessary, communicators helped to translate commercial pesticide doses into measures comprehensible in local terms, like "X numbers of tuna can-fuls per water pail."

The outcome of this instance of true integration was dramatic. In Huaraz, plots infested with papa kuru previously yielded only five or no 100 kg sacks of usable potatoes. Now, these same plots regularly yield 20 sacks of edible and/or commercially acceptable produce.

A parallel case could be recounted for CTTA efforts to combat utush, a principal pest of maize in the Andes. The result is that producers now reap larger, "cleaner" choclos which sell for twice the price of untreated maize. Another example is the rethinking of formal methods for randomly sampling pest infestations in the irregularly shaped fields of non-Western farmers. The change allows farmers to determine whether pesticides are worth the expense once they have learned how to identify the different life-cycle stages of the pests, where to search for them, and what chemicals to apply when.

There are many telling testimonies to the power of the CTTA process (see bibliography). However, the overarching point is that even the best-trained and funded extension systems and the most sophisticated, "slick" communications media cannot succeed unless researchers are accurately informed of farmers' current technical, informational, and socioeconomic resources and can thus identify/devise and communicate realistically workable solutions.

Extension. Extensionists also welcome the concrete, contextualized problem focus that the CTTA process brings. By responding to producer concerns with truly appropriate technology, it makes extension's job of technology transfer more successful and professionally rewarding. Armed with information that producers need, want, readily comprehend, have participated in providing and validating, and (as per some field interviews) may even be willing to pay for, extension agents reportedly have experienced impressive gains in motivation, status, morale, and professional self-esteem.

As one Honduran field agent put it, "Now I know that any work I do will have an impact. Why? Because I know it responds to a real need." Such has been the shift in motivation that, when official vehicles break down, agents have been known to take a bus or even walk long distances so as to be sure to arrive on time for their meetings with clients! Reportedly, too, clients now assemble for such meetings early, instead of straggling in late or skipping them altogether. Indeed, agents describe how, in anticipation of their visit, clients even wait along the road to welcome agents when they arrive.

These shifts in the behaviors, attitudes, and mutual confidence of all players in the agricultural science system stand in direct contrast to previous situations described for both Honduras and Peru. Extensionists,

frustrated with very poor linkages to research, were poorly motivated to perform, or alternatively, tried to create technology recommendations of their own. In either case, extension generally held very low credibility and esteem among farmers.

Certainly, a deciding factor in creating more confident, sustained, and/or widescale integration between extensionists and farmers has been the communications media. Numerous beneficial outputs of this media-supplemented approach were cited. Interestingly, CTTA media are considered to have almost as many positive impacts on extensionists as producers. For example, extension directors remarked that the media are just as useful for reinforcing extension training as they are for educating farmers. Many extensionists also emphasized how the media have helped to systematize the information that they are to deliver to producers of a given region and socioeconomic, cultural, and linguistic type.

The very existence of these media has also lent extension a certain cachet and renewed motivation. They now have tangible (print) and striking (radio) materials to back up their interpersonal, verbal message deliveries. As one field agent put it, "Before, we went to the campo empty-handed. The only materials we had to work with were ourselves."

Moreover, these media provide a way to maintain contact with the client population throughout the year, despite problems such as: lack of vehicles, repair funds, and fuel for adequate extension visits; relatedly, the highly dispersed settlement patterns of many client groups; infrastructural and/or climatological conditions that effectively isolate many producers during much or even all of the year; in Peru, co-op land invasions, inter-community disputes, and terrorist actions that threaten the safety of extensionists and sometimes even the clients they attend; in Honduras, annual salary and contractual tangles that can leave the extension service virtually unmanned during eight months of the year.

Indeed, many interviewees commented that radio and print media constitute many producers' only contact with extension. Although CTTA is not designed to substitute for the indispensable interpersonal contact, extensionists nevertheless opined that this indirect contact was "better than nothing," and that at the very least these media served to guide producers to sources of more complete information.

Farmers. Farmer integration has been amply discussed in preceding sections. Here, we will merely note how the team was struck with producers' real hunger for, and appreciation of, competent, reliable extension assistance and improved agricultural technology. Paraphrasing just a small sampling of farmer commentary in this regard:

I have been a farmer for more than 40 years and the truth is that in our community we really have not made any significant innovations. What we needed were facts. But before this project, extension always stayed with the big producers. It never came to us small ones. (From a Comite Agricola member in Honduras.)

This program is practical, and we are really learning from it. Before, we did not even know what caused such things as plagues of insects, so we could not combat them. We would like more infor-

mation on how to improve our production of broad beans, cattle, guinea pigs, and poultry, too [as well as maize, potatoes, and wheat]. We need to become more "technified." (From farmer interviewees in Peru.)

Planning and Communications Strategy Development

One of the strongest features of the CTTA process is the attention devoted to planning and communications strategy development. Using the developmental investigation as a take-off point, project personnel, working as a team, prepare detailed plans and strategies for diffusing selected technologies to priority groups. Program participants were uniformly enthusiastic about the benefits of concrete plans for geographic and target audience outreach based upon the investigative stage. Both field agents and extension directors described how, before, their efforts were vitiated by a diffuse, disorganized approach to clients in their assigned regions. With only rudimentary or obsolete baseline information on the distribution of producers and crops, research and extension personnel were unable to efficiently allocate their scanty human, vehicular and other resources even by such basic parameters as population densities and zonal production potentials.

With extension goals re-defined in terms of concrete locales and their problems, the programs focuses upon a priority selection of communities or agencies until solutions are achieved. Thereafter, a new prioritization is made and other sites are targeted. The results of this kind of coordinated planning and follow-through is professional gratification for and increased confidence among all participants as each witnesses the positive outcomes of his/her active participation in the CTTA process. As one field extensionist in San Luis put it:

Before, we (extensionists) had no idea of what we were extending or why. There have been big changes. Now we know how many people will be attended, where, and what training we will give them. Before, we were expected to work with everyone, everywhere. We were just told, "You have to give such and so number of talks and field days." Everything was by numbers, not by objectives. All of the planning was done at a much higher, central level, we just received the orders. Often, we couldn't read, much less understand, some of the charts of numbers they sent us from the regional level."

The same degree of attention was given to determining the approaches to be used for communicating technical information. CTTA communication strategies can be broadly classed into print and broadcast media. The latter consist of radio programs and spots geared primarily for farmer consumption. Printed materials address the entire gamut of players in the public-sector agricultural science system and include: administrative and ministerial reports; scientific and project documents; extension guidebooks, newsletters, and newspapers; and manuals, flyers, bulletins, and posters directed to farmers. CTTA is also designed to provide support to research and extension database and information services, like Honduras' CEDIA.

Here we discuss only the strategies directed to farmers. However, it

is important to note that communicator's preparation and production of materials with and for research, extension and administrative units represent another communications strategy that works to enhance overall integration and motivation within the agricultural science system.

Without visual aids, it is difficult to capture and "communicate" textually what is "different" about CTTA communications strategies. Certainly, it is not the physical quality of their production. While some (notably administrative and ministerial) documents are very handsomely done, many are of the most modest sort imaginable (handdrawn and mimeographed or stencilled). Because of CTTA's exceptionally rocky funding history, radio broadcasts, too, approach the minimum technical quality to be audible and engaging. It is testimony to the great creativity and dedication of CTTA communicators that, working with jerry-rigged or K-Mart-quality equipment, project broadcasts have had such powerful impacts.

Once again, the secret to the success of CTTA communications strategies lies in the "process": the initial diagnosis of farmers' linguistic, educational, socioeconomic, agroecological, etc. characteristics and preferred communications channels for acquiring credible agricultural information; above all, researchers, producers, extensionists and the participation of communicators alike in the painstaking validation of media content, presentation, scheduling, etc.; and the continual monitoring of media relevance and efficacy via "formative evaluations." Together, these elements embody much of the social marketing savvy built into the CTTA approach.

The participatory validation process merits particular discussion. Naturally, the scientific content of messages is carefully reviewed with researchers. But even more important, working closely with communicators, representative farmers as "consumers" also critically evaluate all design features of the agricultural communications strategies and messages. This includes considerations like the following.

a) The timeliness of delivery vis-a-vis the agricultural calendar and the target clientele's daily work routine. There is little point in delivering a message on, say, land preparation when planting is in full swing. Likewise for print or broadcast communications that are to be delivered at a time of day when the farmer is too busy to receive them.

b) Of course, the choice of language and lexicon. Little is to be gained by couching messages in alien tongues and terms. Accurate translation of scientific jargon or unfamiliar national-language terms into everyday farmer vocabulary is a must.

c) Closely related is the choice of dialect and vocal style in radio broadcasts and dramatizations. Ceteris paribus people give more credibility to information delivered by a co-ethnic or peer.

d) The graphic design and layout, visual symbology, logical organization, color scheme, and even the typestyles of printed matter must all be validated for intelligibility and appeal. To give just a few, simple examples of farmer inputs that triggered re-formulation of materials, Peruvian producers were led astray by an initially poorly designed graphic which caused them to misapply pesticides. Honduran farmer

critics found the order of frames in a cartoon-style flyer on land preparation techniques illogical. Others were unfamiliar with Western-world symbols like the skull-and-crossbones on poisonous chemicals. Peruvian consumer panels judged a script-like font much more readable than an elite type.

e) The "interactive" quotient of strategies for example in Peru, technical manuals that included a self-test at the end, can verify their understanding of the lessons; and in Honduras, radio formats that include opportunities for farmers to recount their own experiences with new technology, pose questions, and enunciate fresh additional needs or concerns. Information assimilated in an interactive or participative fashion is more likely to be remembered and used.

This list is only exemplary, not exhaustive, of the kinds of features that CTTA attends to in designing its communications strategies. This is the unique contribution of CTTA communicators.

Monitoring and Feedback

These constitute the fourth key component of the process. The objectives are to measure progress to that point, determine strengths and weakness in technology transfer implementation, and feed this information back into the process so as to make timely corrections and improvements.

The latter may consist of revising message content or structure; re-targeting outreach efforts to new or more precisely defined populations; re-allocating investments to reinforce communications channels shown to be most effective or, conversely, most lacking; returning to researchers with new or corollary technical problems to be solved; and so forth.

In CTTA formative evaluations to date, aspects of message assimilation has been quantitatively assessed through surveys of client subsamples to discover whether farmers have received the messages promulgating different technology recommendations, can accurately recall the recommendations, have acted upon them, and have done so correctly. Qualitative data may also be gathered through participant observation and open-ended interviews on other behavioral and attitudinal changes, crop outcomes, and client concerns.

In essence, this monitoring and feedback component is what makes the CTTA methodology a true "process," in contradistinction to other, more rigid approaches. It is dynamic rather than static, client and context-sensitive rather than institutionally driven, and participative rather than hierarchical.

To conclude, the four basic components outlined here add up to "Communication" in the fullest sense of the word and with it, a successful system of technology design, development, and delivery.

C. INSTITUTIONALIZATION

The project paper calls for institutionalization of the CTTA approach through the development of procedures for the effective use of communication for technology transfer in agriculture and the integration of these

procedures into the on-going research/extension systems of participating nations.

As discussed above, the project has been successful in developing an effective process for technology transfer, but it has been only partially successful in institutionalizing the process in the two pilot countries. However, it must be borne in mind that CTTA has been functioning for only a relatively brief time, 33 months in Honduras and 30 months in Peru.

In Honduras, the CTTA process was used as the basis for designing the "Unified Methodology for the Delivery of Services." This has been officially adopted by the Secretariat of Natural Resources as their approach for the delivery of all Ministry services, including technology transfer. The interest in a unified approach to technology transfer in Honduras was not new. The annual national extension conventions of 1986 and 1987 devoted considerable attention to the subject which led to the formation of a commission to develop a common methodology for technology transfer. The project advisor and key staff of the CTTA project played major roles in drafting the new methodology. In December, 1988, the SNR distributed the unified methodology to regional and general directorates with instructions to Secretariat employees to systematically introduce the methodology for the delivery of services.

As of April, 1989, the methodology was being applied in Comayagua department (the CTTA pilot area) and was just getting started in five other regions. The SNR has formed a technical team with representatives from research, extension, livestock, human resources and communications to introduce the methodology throughout the country. A substantial training effort will be required to institutionalize the methodology in the public sector, including site visits and training sessions for SNR personnel at the pilot site in Comayagua.

The SNR Department of Agricultural Communications (DCA), which is key to the whole CTTA process, is supported entirely by PL-480 funds. SNR officials stated that a line item for the DCA is to be placed in the GOH budget beginning in January, 1990. Given present financial stresses on the GOH, however, USAID/Honduras should monitor this closely to help assure that the DCA obtains GOH funds next year. With budgetary support from DCA assured and a good training program for the unified methodology in place, the CTTA process stand a very good chance of being institutionalized in Honduras.

In Peru, the CTTA process has attracted a good deal of interest and support in the National Research Agency (INIAA) and at the field level in Huaraz and Puno but it is understandably a long way from being institutionalized within the public sector. The prospects for institutionalization of the CTTA process in Peru are less bright. The project has made good headway in demonstrating the benefits of the process in Huaraz. INIAA and Ministry of Agriculture (MOA) officials have visited the pilot site and came away impressed with the improvements in coordination, farmer involvement, and coverage which have resulted from application of the CTTA process.

When the extension service was moved out of INIPA and back to the MOA in 1988, the CTTA project was retained in INIAA. The rationale for this

decision was that CTTA is a research project that should be carried out by the research agency. Based upon the success in Huaraz, INIAA decided to support extension of the methodology to Chiclayo and also to Puno, where the project is working closely with CIDA-funded programs in alpaca and traditional Andean crops. While officials in INIAA and the MOA have expressed their interest in and support for the CTTA approach, there has been very little movement to institutionalize the process within either INIAA or the Ministry. There are no comprehensive documents which describe and explain the process and there are not sufficient trained personnel within INIAA to take over direction of the program when the AED technical staff withdraws. The evaluation team urged Jose Ignacio Mata and Martha Cruz to consider shifting their priorities during the time remaining under the project to concentrate on steps necessary to institutionalize the CTTA process within the public sector.

The ability to move forward with institutionalization in Peru is severely constrained by funding problems. The contracts for Mata and Cruz will have to be terminated at the end of June unless additional funds are made available. USAID/Peru indicated that the only local source of funding for continuing the services of Mata and Cruz after the end of June would be from the Agricultural Technology Development and Transfer (ATT) project. Whether or not these funds are made available is up to INIAA. The Technical Director of INIAA indicated that they had been impressed by CTTA's work but were not sure whether they would have funds to continue Mata and Cruz, given all of the other demands on the ATT project.

The S&T Bureau should explore the possibility of utilizing core funds to continue Mata and Cruz for one additional year (through June, 1990) to allow sufficient time to thoroughly document the process carried out in Huaraz, prepare training materials for INIAA to extend the methodology to other regions of the country and work with INIAA staff to develop their capacity to carry on the program in the absence of Mata and Cruz. As stated in Section IV, the first priority for the use of core funds should be placed on documenting and disseminating program results from Honduras. If sufficient funds are available after assuring proper wrap-up of the program in Honduras, the second priority should be to continue Mata and Cruz in Peru for one more year. An alternative would be to persuade INIAA and/or FUNDEAGRO to use ATT project funds to fully or partially fund continuation of the two AED technical advisors. Another variation would be to try to obtain funds from the Administrator's set-aside for Private Provision of Public Services (described in Section V) for a buy-in to the CTTA project to allow Mata and Cruz to work with FUNDEAGRO for a year or two to apply the CTTA methodology to the pilot private sector technology transfer enterprises contemplated under ATT. In any case, the costs charged to the AED contract for maintaining the two advisors in Peru would have to be sharply reduced from the 1988-89 rate of \$18,000/month. This should be possible given their relatively modest salaries.

D. COMPARATIVE EXTENSION MODES

This section reports on selected qualitative and quantitative measures of output for three transfer extension modes: the training and visit (T&V) system, conventional extension with some communications support, and the CTTA technology transfer process.

There are other modes such as the research/extension liaison unit and the contact/neighbor extension mode being implemented in Ecuador and Guatemala, respectively. These are not included because the data base is even less complete than for the three selected modes.

The criteria chosen for this comparative evaluation include changes in attitudes (confidence, credibility and motivation), physical outputs (yields, net farm incomes, etc.), changes in knowledge or capacity among individual farmers and extensionists as well as institution leaders, and a comparison of technology transfer components.

A brief description of each mode follows:

1. **Training and Visit (T&V)** -- During 1987, this transfer mode was being implemented in over 40 developing countries on a national or project basis.^{1/} Major features of the T&V system include a high ratio of agents to farmers, bi-weekly training of field extensionists by subject matter specialists, a regularly scheduled set of visits to contact farmers who in turn extend knowledge to neighboring farmers, close supervision by extension leadership, provision of motorbikes or other forms of mobility along with adequate operational support, and agents' exclusive devotion to extension.

As reported by G. Feder and others, the costs of establishing and maintaining the T&V system are relatively high. Between 1980 and 1985 the World Bank supported many T&V systems where the total costs were about \$200 million per year. There are few extension systems in the developing world that annually allocate even 10 to 20 percent of this amount.

The T&V system includes a feedback process from farmers to specialists to researchers. The system is also flexible in adapting to group meetings, demonstrations, the use of selected communication modes and a calendarizing of problem sets by crops. In some locations the T&V system selects priority communities and in each location the contact farmers are carefully selected as representative change agents.

2. **Conventional Extension** -- In this mode extension is generally organized as a division within a national institution responsible for generating and extending agricultural technologies. The extension division operates nationally with regional and local agencies, a corps of extension specialists, a communications department within the extension division, modest feedback processes linking extension agents to researchers, a low ratio of agents to farmers and usually an assignment of some non-educational functions to field extension agents. In most countries the extension plan calls for national coverage with little prioritization of communities, agencies or techniques.

1/ Sources: "Does Agricultural Extension Pay? The Training and Visit System in Northwest India," G. Feder, L. J. Lau and R. H. Slade, AAEA, Vol. 69, No. 3, Aug., 1987, pp. 677-686; Training and Visit Extension, D. Benor and M. Baxter, World Bank, Washington, DC, 1984; "Institutional Development, The World Bank and India's New Agricultural Extension Programme," J. Dev. Studies 20(1984):303-17.

In general terms, agents have poorly programmed workplans, low salaries, poorly structured career ladders, low levels of operational support and very modest modes of transport. Moreover, they are subject to frequent political interventions and have low status as compared with researchers.

In many developing countries, national extension programs are organized as a part of national commodity programs. Typically, there is an excessive number of such programs with inadequately trained and supported staff.

3. CTTA Process -- Although this has been described in other sections of this evaluation, several salient characteristics of the process are reiterated here.

The process starts with a selection of locations; a needs assessment or developmental investigation is completed; communities, commodities and relevant technologies are prioritized; a diffusion strategy is developed and implemented; periodic formative evaluations assess the strategy's successes and weaknesses; the process provides for a continuous feedback; and, as part of the strategy, training activities are held with farmers, extensionists and institutional leaders. Another important characteristic of the CTTA process is the inclusion of communication specialists as equal participants in all components.

Unfortunately, all of the extension modes discussed above have failed to develop some critical linkages. These include linkages with public or private educational institutions, with input suppliers and product handlers, and with the communications and training departments of the International Agricultural Research Centers.

The section that follows reports on selected output criteria for the three extension modes. This comparative analysis is preliminary because time does not permit compiling more complete data bases. The comparisons are based on data assembled from selected publications of the T&V system, unpublished reports on the evaluation of extension projects conducted by the National Institute for Research and Promotion (INIPA) in Peru, a report on an ex-ante evaluation of research and extension in Peru (the estimates of internal rates of return assume a conventional extension approach), the report of the evaluation team on the CTTA process, and upon experiences gathered from many publications and visits related to agricultural technology transfer activities.^{2/} This analysis, while preliminary, is illustrative of the product that could result from an in-depth study of different extension modes.

The comparisons are presented in Table 5.

^{2/} Unpublished reports from 1985 and 1987, "Summary of an Evaluation of Extension Programs by INIPA," A. Carrasco Gutierrez and M. D. Openshaw, Lima, Peru, February 1989. See the report on "Potential Benefits of Agricultural Research and Extension in Peru," G. W. Norton, V. G. Ganoza and C. Pomareda, AAEA, Vol. 69, No. 2, May 1987, pp. 247-257

Table 5: Preliminary Comparisons of Selected Output Criteria for Three Agricultural Extension Modes.

Output Criteria	Extension Modes		
	T&V System	Conventional Extension	CTTA Process
<u>Attitude Changes</u>			
Confidence between farmers and extensionists ^{2/}	N.A. ^{1/}	Very modest	Very favorable
Confidence between extensionists and extension directors	N.A.	Little to none	Very favorable
Confidence between extensionists and researchers	N.A.	Very modest	Very favorable
Motivation of extensionists	N.A.	Poor	Good to very good
Motivation of extension directors	N.A.	Poor	Good to very good
Credibility with farmers	N.A.	Modest	Very favorable
<u>Capacity Changes^{3/}</u>			
For individual farmers	Modest	Modest	Very favorable
For extension Agents	Favorable	Poor to modest	Very favorable
For regional extension directors	Modest	Modest	Favorable
For national extension directors	Modest	Very Modest	Favorable

^{1/} Not available (N.A.) from limited bibliographic search but on-going studies in the World Bank may provide estimates.

^{2/} "Extensionists" refers to field or agency level extension personnel.

^{3/} Capacity changes refer to organized training programs as a component of the overall strategies.

Table 5: Continued.

Output Criteria	Extension Modes		
	T&V System	Conventional Extension	CTTA Process
<u>Physical Output Changes</u>			
Yields per hectare	5.1 to 13.9% increase ^{4/}	3 to 6% increase ^{5/}	6 to 10% increase ^{6/}
Net farm incomes	N.A.	N.A.	N.A.
Quality of physical output	N.A.	N.A.	Qualitative evidence
Cost/benefit ratios	15 - 18% ^{7/}	N.A. ^{8/}	N.A.
Adoption rates	N.A.	5 to 33%	10 to 70%
<u>Comparison of Components</u>			
Developmental investigation	None	None	Integral component
Formative evaluations	None	Special studies	Integral component
Feedback mechanism	Modest	Modest	Very favorable
Communications components	Partial involvement	Partial involvement	Integral component

^{4/} Reference the paper by G. Feder and others in journal of AAEA, August 1987 on procedures. The comparison is for two areas with and without the T&V system on wheat production.

^{5/} Reference is to two unpublished papers on an evaluation of extension project of INIPA, 1985 and 1987. The data are extensive in terms of the number of locations, crops, value added, etc.

^{6/} Reference is to unpublished data from Honduras as reported by a member of the summative evaluation team.

^{7/} Reference is to estimates of internal rates of return from the AAEA paper by G. Fedor and others. See the paper for specific procedures used to estimate these rates.

^{8/} Norton and others estimated internal rates of return to research and extension in Peru that ranged from 17 to 38 percent under varying assumptions. There are no known estimates of internal rates of return for the extension component.

E. SUMMATIVE EVALUATION

The CTTA summative evaluation is not part of the CTTA process, but rather of the experimental design of the project. As such, it was to evaluate changes in attitudes; yields and farm incomes; knowledge or increased capacities through training of farmers, extensionists, researchers and others; and cost effectiveness.

Outputs from the summative evaluation have been minimal. There is an unanalyzed data set that includes baseline surveys (Honduras and Peru), follow-up surveys in Honduras that remain to be analyzed and selected descriptive reports on crops and agencies in Honduras along with an assessment of the formative evaluation in Peru.

Even recognizing the financial pitfalls of the CTTA project, there should have been some preliminary results from the summative evaluation process but the evaluation team was unable to obtain analyses of baseline data in either Honduras or Peru or analyses of follow-up surveys completed in 1987 and 1988 in Honduras. There appear to be various reasons for such low productivity, independent of financial constraints.

Some probable reasons are described below:

1. There was a lack of agreement, beginning in the design phase, over the focus of the evaluation on communications as an instrument to change farmer behavior versus productivity and income changes resulting from the CTTA process.
2. There was synchronization of the implementation and evaluation components in the beginning but as implementation proceeded, the project drifted away from a narrow focus on farmer behavior toward the transfer process itself. However, at this point the evaluation methodology, with its narrower focus, was already in process.
3. The evaluation team postponed some of their activities to support implementation needs for descriptive data on communities and commodities.
4. There was a substantial lack of agreement among project personnel (operational and evaluative) on the summative evaluation's design. The debate centered on the instruments' over-design, complexity and inadequate specification. This clearly delayed progress on the summative evaluation.
5. Early on in the project, agreement was reached to drop the requirement to evaluate productivity and net income changes. This choice led to confusion among project personnel but was based on the complexity of the relationships between variables and the high cost of completing a formal creditable economic and efficiency evaluation.
6. Further delay arose from disagreements over the failure to adequately specify dependent-independent variable relationships for a general set or sub-sets. Data were gathered on over 2,000 independent variables in Honduras and some 1,500 variables in Peru. A clear model of probable relationships was not specified in the original design. It

would appear that such relationships were to be specified as the evaluation proceeded or after the data sets were available.

7. The design for the summative evaluation was negatively impacted because the implementation phases moved much faster than anticipated. Another explanation was that attitudinal and adoption changes involving many crops with many production phases necessitated early decisions on the overall strategy.
8. The overly descriptive statements on the evaluation methodology raised more questions than answers. The concern was, what would be done with all that data? An example was the excessive detail as to what and why for each step of each commodity produced.
9. Disagreements associated with the multiple tier of managers (implementation and evaluation) delayed decisions on the evaluation process. Another area of disagreement and delay might be associated with indecisions on how to utilize the data set developed for the formative evaluation.

Some implications of these probable causes for low productivity associated with the summative evaluation and recommendations are presented in the next section.

IV. GENERAL CONCLUSIONS AND RECOMMENDATIONS WITH RESPECT TO CTTA

Throughout the developing world, there is a consensus that public efforts to transfer agricultural technologies have not been successful. There are many explanations for this, including poorly managed and over-staffed extension bureaucracies; a severe lack of motivation of extension personnel; weak linkages between researchers and extensionists that may be associated with the educational and cultural gaps between these professionals; low pay and the lack of career opportunities; a failure to view and institutionalize the reality that technology development and delivery are elements of a science-based system; and the view that extensionists are not educators but rather ministry representatives in rural areas with many non-educational responsibilities.

The preceding paragraph paints a picture of seriously ailing TT system. It also forms the basis for skepticism that team members brought to this evaluation. This critical and skeptical attitude was challenged by pre-field meetings in AID/W where many suggested that CTTA was a "magic bullet" on technology transfer.

In summary form, the team reports that the CTTA process has changed a skeptical attitude to a very hopeful attitude. The CTTA process, communications is but one component, has been singularly successful in changing attitudes of researchers, extensionists and farmers, enhancing crop yields and perhaps farm incomes, along with favorable knowledge changes impacting farmers, extension workers, and regional as well as national extension leadership.

The CTTA technology transfer process, described in Section III, does not involve any really new components. Rather it incorporates a set of activities that brings a systematic approach to technology transfer, a disciplined workplan to field extensionists, a motivational and confidence element that reduces the gap between researchers and extensionists, a confidence-building element between field extensionists and farmers, along with a knowledge enhancement for all participants in the process that may be an absolute requirement for institutionalization.

Unfortunately, at this time most of the evidence in support of the CTTA process is qualitative and anecdotal. This type of evidence is necessary but insufficient.

Some further requirements are positive forms of evidence that the process is operative with client groups with higher educational levels and clients that require more complicated technological packages. In addition there must be positive quantitative estimates of productivity changes, net farm income improvements as well as a data base for comparing net transfer process benefits (perhaps least cost comparisons) among alternative technology transfer modes (training and visit, conventional extension and CTTA technology transfer, etc.)

Another sufficient condition relates to an explanation of the necessary conditions for institutionalization. The output of the CTTA process relating to the transfer of knowledge, including the training of participants, is required.

Still another quantitative indicator would relate to greater explanatory evidence on the output of the communications component.

Even without these quantitative assessments, however, one can say that the CTTA process appears to make a lot of people feel like something. This focus on motivation of all the participants appears to be related to the fact that participants are given a vision of what might be, there are no empty promises because the vision appears to become reality, there is a hard training component for all participants and the process works when given administrative and leadership support.

Clearly, the CTTA experiment has stimulated some creative thinking about how USAID might assist "sick" agricultural extension programs. The following recommendations address essential future actions that could reduce uncertainties associated with the CTTA process.

These recommendations are:

1. That resources be mobilized to further test the CTTA process with other client groups. There are options in Honduras by keeping Dr. M. Munoz working in selected locations on further testing of the process. Similarly in Peru there are options to continue Jose Ignacio Mata working in Puno and Chiclayo on public agencies as well as with FUNDEAGRO on private sector extension transfer processes. The requirement for further testing is that such tests provide qualitative and quantitative data on the process.

2. That a video tape be made to graphically depict the CTTA process and to disseminate at least the qualitative findings of the process to date. The video should include activities in Honduras and Peru, directed at developmental leadership audiences in various countries, produced in Spanish and English. Wherever possible it should incorporate quantitative evidence on outputs relating to attitudinal shifts, agricultural yields and farm family incomes, knowledge gains and training achievements as well as evidence on net benefits or the cost effectiveness of the process.

3. That resources be mobilized and a conceptual outline made to prepare an end-of-project document suitable for dissemination to the global development community with interests in agricultural technology transfer. This document should complement the videotape, summarizing and graphically illustrating the CTTA process. The present project directors in Honduras and Peru should be involved in preparing materials for inclusion in the document, based on their firsthand insights. Again, so as to make most efficient use of scarce resources, creative, cost-effective publishing and dissemination arrangements should be investigated.

4. That resources be mobilized in support of new more scientifically reasoned and financially reasonable initiatives to complete selected elements of the summative evaluation. The first priority should be to quantify changes in attitudes (confidence, credibility and motivations) associated with the CTTA process. A second priority would focus on quantifying changes in yields, net incomes and on calculating the cost effectiveness of this approach relative to other TT systems. A third priority would focus on quantifying changes in knowledge transfers particularly as associated with the institutionalization process.

For each of the priority analyses, an initial requirement is to conceptualize and model the relationships in question. There is a need to carefully specify the dependent variables as well as the independent variables. Further, there is a need to carefully specify the methodologies to be used.

Given a methodology, the next step would be to assess the existing data base found in formative evaluations and the raw data available from summative evaluation efforts. The need for additional data sets would result from this assessment.

The general approach to completion of the summative evaluation should focus on quality data (measurement, not recall data), small samples and very careful specification of the issues to be evaluated.

It is also recommended that further summative evaluation efforts focus on the CTTA process, include a strong economic orientation, be performed by agriculturally expert investigators and provide a mechanism for cooperating with the present project directors in Honduras and Peru.

5. That project leadership review a study on CTTA institutionalization in Honduras that was initiated by Dr. O. Hernandez. If the paper, not yet completed, contains essential descriptive material, decisions should be made on how to complement the paper, purchase the revised version and disseminate it to development leaders in Honduras, Peru, and other countries, as well as to USAID Missions.

6. That the remaining resources associated with the project, which are very limited in amount, be directed at field sites for further validation and in support of new initiatives to complete summative type evaluations. This recommendation implies sharp reductions in home-office support for project activities including the summative evaluation.

7. That discussions be initiated with USAID missions in Honduras and Peru regarding their reluctance to provide further funding in these countries. Their concerns may relate to a lack of knowledge of the CTTA process, insufficient knowledge of net benefits and possibly inadequate knowledge of cost effectiveness.

8. That efforts be initiated with the World Bank on two issues. First, an exploration of how the CTTA process might impact the general impression of the high costs of the Training and Visit system. Secondly, an exploration of World Bank interests in further testing and the quantitative evaluation of the CTTA process.

9. That efforts be initiated with the African Bureau on an exploration of the probable complementarity of the CTTA process to farming systems research. The African Bureau has invested heavily in this area and the CTTA process may provide a mechanism for enhancing the product of previous investments.

V. GENERAL CONCLUSIONS AND RECOMMENDATIONS -- LOOKING AHEAD

In attempting to look ahead to future Agency needs in agricultural technology transfer, the team met with a number of S&T and regional bureau staff in AID/W. We encountered general agreement that many of the public sector extension organizations in AID-assisted countries are ineffective and a drain on domestic budgets. There was also the feeling that AID had tried for years to improve these organizations but had been unsuccessful and that Mission Director and Agency leadership were reluctant to commit any further resources to public sector technology transfer programs. There was, nevertheless, the recognition that agricultural technology was critical to economic growth. In Asia and Africa there is continued AID support for agricultural research, but almost no resources for technology transfer. This has been left largely to the World Bank and its T&V approach. In Latin America, frustration with the ineffectiveness of public sector extension programs has led to AID support of private sector foundations, farmers' associations, or private voluntary organizations as alternative technology transfer mechanisms.

We believe that improved approaches to technology transfer are needed if the developing countries are to make effective use of the technology being generated by the International Agricultural Research Centers and of the investments in improving national research systems. The CTTA project offers one such approach which should be thoroughly documented and widely publicized, as suggested in Section IV. As the CTTA project enters its final phase during FY 1990-91, the Science and Technology Bureau should give serious consideration to developing a follow-on project in technology transfer. Such a project should provide for continued dissemination and application of the CTTA process, but it should also be expanded to include research and field support activities related to options for increased technology transfer by the private sector and to the special problems of natural resources management technology transfer. To this end, we recommend:

1. That over the next two years (FY 90 and 91), the remaining CTTA project resources be concentrated on documenting and publicizing the technology transfer process developed in Honduras and Peru.

2. That concurrently (during FY 1990-91), the S&T Bureau a) should tap into the resources set aside by the Administrator for proposals related to the Private Provision of Public Services to fund a study of the rich and growing experience in private sector approaches to technology transfer, including a comparative analysis of the cost-effectiveness of selected private and public technology transfer mechanisms, b) use the Small Activities Fund to conduct a state-of-the-art study of technology transfer approaches for natural resources management.

3. That the S&T Bureau undertake a Tri-Directorate (HR, FN and EN) collaborative effort to develop a FY 1992 follow-on project to CTTA which would have the capability to assist field missions and host governments that want to improve their technology transfer system in agriculture and natural resources management. The tools available to the project would include the CTTA process, private sector approaches to technology transfer and improved approaches to technology transfer for natural resources management.

APPENDIX A: SCOPE OF WORK
Mid-Term Evaluation Team
26 March - 15 May 1989

I. Activity to be Evaluated

Communication for Technology Transfer in Agriculture (Contract No. 936-5826-C-00-5054-00)

Total Project Cost: \$19,433,000
(\$7,295,000 S&T Central, \$12,138,000 AID Missions)
Total Contract Cost: \$16,804,016
Initial FY: 85
Final Contract Year: 90
PACD: 9/30/92

II. Purpose of the Evaluation

This interim evaluation will give information for two different yet related purposes:

- A. to analyze project progress toward the objectives set forth in the Project Paper (PP) (as defined by the output, purpose and goal statement of the projects logical framework); and, if appropriate, to AID to improve management and utilization of remaining project resources; and
- B. to look beyond the LOP and assess Office, Directorate and Bureau needs and capabilities for supporting more effective technology transfer in agriculture, especially through the use of enhanced communication. Analysis of these broader programming issues (see A.I.D. Evaluation Handbook April 1987) will be available to help shape future program development and planning in technology transfer and related initiatives.

III. Background

The Communication for Technology Transfer in Agriculture (CTTA) Project was authorized as an eight-year activity to be managed jointly by the Bureau for Science and Technology's Offices of Education, Rural and Institutional Development, and Agriculture. The project purpose as presented in the PP is to "develop and demonstrate a more effective communication support system for technology transfer in agriculture".

CTTA uses an innovative extension approach to transfer technology to farmers. This approach, which is based on social marketing techniques, is characterized by:

- a) the analysis of farmer needs and the "feed forward" of this information to Research and Extension to help shape their priorities;
- b) the identification of communication channels used by farmers to become informed of appropriate available technologies, and the informed and targeted use of multiple media to transfer appropriate technologies to farmers; and

- c. the permanent monitoring and frequent evaluation of activities to determine the efficiency and effectiveness of the media utilized. Theoretically, this insures a dynamic flow of information from the "bottom-up" to help shape implementation.

The intent of CTTA is basically twofold: 1) to increase the impact of new technologies on the farmer in an efficient and cost-effective manner, and 2) to institutionalize the CTTA approach to technology transfer in agriculture. Only through institutionalization can activities initiated by the project be sustained beyond the life-of-project funding, and this will be an important concern of the evaluation.

Project outputs (as set forth in the PP, pp. ii-iii) are expected to include evident impact in five key areas:

- 1) development of effective procedures for providing communication support for technology transfer;
- 2) production performance of the farmers in the pilot sites;
- 3) organizational changes induced in the collaborating institutions;
- 4) diffusion of the communication methodology to additional sites; and
- 5) modification of the accepted norms for conducting extension among the international community.

To achieve these outputs the PP calls for \$7,295,000 of S&T funding and substantial complementary funds from field missions. However, Central funding constraints have made actual funding less than half that originally anticipated. This must be taken into careful account by the evaluation team, especially as related to purpose A of this evaluation.

Two interim evaluations were scheduled in the PP (8/87 and 8/89). However, this evaluation is expected to adequately address all the interim evaluation information needs of project management. This is especially true given the strong communications channels that exist between A.I.D./W project management and the cooperating missions, and given their strong endorsements of CTTA.

The timing of this evaluation is appropriate for several reasons. The A.I.D. Evaluation Handbook (April 1987, p. 15) notes that a "major factor in determining when to evaluate is the contribution of the evaluation process itself to improved communication and policy dialogue with A.I.D. recipients during key junctures in implementation and program development." The project does indeed appear to be at "key junctures" in at least two project sites (Honduras and Peru) especially as regards the institutionalization of CTTA procedures and methodologies. The evaluation process at this time, and the written report that will follow, could contribute substantially to attainment of long-term project objectives.

The recent and innovative CTTA research activity in Niger has also generated a great deal of interest in the academic and the development communities. Requests for the research report "A Case Study on Farmer

Innovations and Communication in Niger" have exceeded all expectations, with over 500 copies distributed internationally to a broad audience of scholars and development specialists. Interest in this research continues to grow, and the contractor for CTTA, the Academy for Educational Development, has put increasing emphasis on developing expertise in indigenous agricultural knowledge and their applications to rural development. The evaluation team should assess possible implications of this research, and of AED's apparent commitment to continue to analyze these kind of issues, for the larger CTTA Project.

This is also an appropriate time to assess project performance toward provision of the five kinds of outputs envisioned in the PP, and help disseminate information through the Agency (and the donor community) on the progress that has been achieved. The Agency needs to know why the collaborating missions feel this new approach to technology transfer in agriculture has proven successful, and an evaluation will allow project management to disseminate these conclusions widely. This will also help address purpose B of the evaluation, looking beyond the LOP to assess future Office and Bureau needs and capabilities for supporting more effective technology transfer in agriculture.

IV. Statement of Work

A.I.D. (Evaluation Handbook, p. 23) requires that all evaluations examine several broad concerns "that are applicable to virtually any type of development assistance." These are:

- o Relevance. Are the development constraints the project was initially designed to address major problems that are germane to the current development strategies supported by A.I.D.?
- o Effectiveness. Is the project achieving satisfactory progress toward its stated objectives?
- o Efficiency. Are the effects of the project being produced at an acceptable cost compared with alternative approaches to accomplishing the same objectives?
- o Impact. What positive and negative effects are resulting from the project?
- o Sustainability. Are the effects of the project likely to become sustainable development impacts -- that is, will they continue after A.I.D. funding has stopped?"

The evaluation team is expected to go beyond a simple examination of inputs and outputs to address these larger issues, and in particular, to assess the utility of the CTTA model. This can make the evaluation process especially useful in promoting policy dialogue, and help address the longer-term issues of purpose B.

Specific questions to be addressed are:

Program areas:

1. What do the primary stake holders say about both the actual and potential utility of the project? (e.g. farmers, nationals in relevant public and private sector institutions, researchers, AID and USAID staff, project staff [present and former]).
2. What does the CTTA methodology actually look like "on the ground"? What are the operational priorities, e.g. how are staff and budget resources allocated? What is the role of host country counterparts in this process?
3. How is reality stacking up against the theoretical models presented in project documents? Specifically, how appropriate is the social marketing model for agriculture? How has the implementation plan been changed or adapted and why?
4. How important a model is it for the transfer of agricultural technologies (of marginal utility? of great potential?)? Does CTTA's field experience suggest ways it can be improved?
5. Can mass media serve farmer needs under variable production conditions? What needs to be adapted to variable circumstances? How universal is the methodology?
6. How appropriate/effective/tested/adapted to local circumstances are the agricultural technologies CTTA is working with? How were they/should they be selected?
7. What, if anything, can CTTA do in situation where the technologies to recommend to local farmers are not yet apparent? How useful can the methodology be to the process of technology selection?
8. How effectively has CTTA used mass media to encourage adoption of new technologies?
9. What has been the actual role of evaluation in the project, and how has it related to implementation?
10. How is farm-level data collected and analyzed? What criteria are used for selection of regions? variables? target crops? Has CTTA's field methodology (e.g. sampling techniques, controlled comparisons) met accepted scientific standards?
11. How much project emphasis has been placed on measuring actual project impact on productivity, rather than simple message reception? Should more/less emphasis be given to this issue in the future?
12. Are effective procedures for providing communication support for technology transfer being developed? Are they cost-effective?

13. Are client needs being address (i.e. has production performance in the pilot areas been affected? better extension service? greater coverage?)?
14. Are there signs of diffusion of the communication methodologies?
15. What Evaluation data should be given priority for analysis and reporting? What are the needs of different audiences (AID/W, USAIDs, host-country governments, etc.)?

Management areas:

1. Have the appropriate people, finances and commodities been in the right place, at the right time, operating under the right incentives to insure effective implementation?
2. How effective is management by AID, AED, sub-contractors? What about the three office funding model? Should this model be continued or encouraged in future S&T projects?
3. How is CTTA understood and supported within AID? What are the main obstacles to securing more interest and buy-ins from USAID Missions and REgional Bureaus? What implications might this have for future of the project, and for any potential follow-on activities, projects or initiatives in technology transfer in agriculture?
4. How effective has been the technical assistance (short and long-term, contractors and subcontractors, etc.) provided to missions? How can it be improved?
5. How has the project interacted with organizations involved in the technology transfer process in the private sector? public sector? PVO community?
6. How effectively are the project's findings being disseminated/marketed to potential users?

Institutional areas:

1. What aspects of the CTTA approach have received attention in the institutionalization process?
2. Explore the ACT methodology for documenting and analyzing the institutionalization process. Should this be given priority?
3. How has motivation for acceptance and commitment to change been generated and/or raised in order to allow for project inception to take place?
4. What has been the political will and absorptive capacity, both technically and financially, to accept and implement the CTTA approach?

5. What has been the attitude within the concerned agencies, the pilot regions and the national level towards the extension approach proposed by CTTA? To what extent is this approach satisfying the government's extension philosophy, needs, and concerns?
6. In Honduras, what has been CTTA's contribution to the definition of MNR's Unified Extension Methodology?
7. Is institutional capacity in cooperating institutions being developed? (i.e. is there any change in the way extension services are being carried out that can be attributed to CTTA?). What evidence is there that any changes will be lasting?
8. Do research administrators better understand and consider the point of view/situation of the farmer thanks to CTTA?
9. What aspects of the project will be sustainable?
10. To what extent has CTTA had access to agricultural technologies proven to be economically feasible for farmers?
11. What training has been given at the agency, national and regional levels to implement the CTTA approach? In what area has this training taken place? How effective has it been in laying the ground work for CTTA activities within and outside the pilot region? How has this training been followed up?
12. What capacity has been developed within the government to better manage an extension approach based on the use of multiple media? What technical expertise has been developed to produce more and better quality media?
13. What incentives for change and adoption of CTTA perspective exists at the agency, regional and national levels? To what extent has an incentive system been utilized to encourage adoption of the CTTA approach?
14. What linkages between extension and research has CTTA strengthened at the agency, regional and national levels? To what extent has farmer involvement in farm research proposed by CTTA been adopted?
15. Within current budgetary constraints of the GOH and GOP, what financial support for CTTA related activities can be expected in the future? Has enough local support been given to date?
16. Is CTTA profitably addressing the full range of potential S&T and Agency needs for assistance in technology transfer in agriculture, or should the project be modified? If so, how?
17. Should the S&T Bureau begin planning a new initiative in technology transfer in agriculture, to begin after the PACD of CTTA? Should this new initiative be a "follow-on" to CTTA, or a completely discrete activity? How would it differ from the current CTTA project?

18. CTTA works to improve technology transfer through enhanced communications between farmers, research and extension. It has not, however, directly addressed improving communications between these actors and other elements of the broader technology development and transfer system, e.g. private sector research and input provision entities, agricultural policy makers, faculties of agriculture, etc. Should CTTA or a future S&T project address this broader technology system, and if so, how?

V. Methods and Procedures

The evaluation team will review available project documents and conduct key informant interviews with project staff, A.I.D./W and mission staff, and project counterparts in Honduras and Peru. It will also make field observations and interview intended beneficiaries in these countries. In addition, in collaboration with A.I.D./W project management, it will help prepare a cable soliciting evaluation information from those missions not visited by the CTTA team (Indonesia, Jordan, and perhaps Niger), and incorporate that information into the evaluation report.

The evaluation must assess the progress that has been made with respect to the institutionalization of the CTTA approach within (but not limited to) the project's pilot regions. It should specify factors that have contributed to or hindered progress towards that goal. This information will be used in planning the initiation of the institutionalization activities in other countries where the CTTA Project can be implemented.

As regards project implementation, the team's emphasis will be on providing project management with sound and useful judgments to help maximize project outputs to the Project Assistance Completion Date. They will also help A.I.D. to assess future needs, capabilities and priorities for technology transfer in agriculture.

Institutionalization should be assessed at three different levels: agency, regional and national. Data will be collected mainly through interviews with concerned parties at each level. Agencies to be visited within the pilot regions will be sampled. The sampling will be intentional. The purpose of this sampling will be to select, through key informants' insights, those agencies where institutionalization activities are expected to show most and least progress. The same approach will be adopted in the selection of regions, projects and programs which may have manifested interest and involvement in CTTA activities. The evaluation team will consider the sustainability of observed institutional change.

In addition to assessing institutionalization at an organizational level, the evaluation team will assess the actual impact of this institutionalization on technology transfer priorities and strategies. This will include specification on what is not being done differently after institutionalization, and how this may relate to changes in technology transfer processes in the two countries visited.

VI. Evaluation Team Composition

The evaluation team of three persons should be interdisciplinary, with expertise in both social and agricultural sciences, and in communication

theory. Given the dual purposes of this evaluation (and especially purpose B) the team should have substantial first-hand experience in working with the broad technology development and transfer system, including agricultural research and extension, private sector input suppliers, faculties of agriculture, etc.

Language proficiency in Spanish is required for at least two team members, and team composition should include both men and women, to avoid gender-based constraints to effective communication.

As recommended in the A.I.D. Evaluation Handbook (April 1987, pp. 25-26), "wherever possible" one team member should be an A.I.D. direct-hire staff not directly associated with the project. He/she must also have the necessary skills and experience to perform all the required evaluation functions. The Handbook notes that "their participation serves as a direct link to Agency operations, expediting the transfer of experience and lessons learned from the evaluation" (p. 260).

VII. Reporting Requirements

A.I.D.'s required format for evaluation reports includes an Executive Summary, Body of the Report, and relevant Annexes.

The executive summary states the development objectives of the activity evaluated; purpose of the evaluation; study method; findings, conclusions and recommendations; and lessons learned about the design and implementation of this type of development activity.

The body of the report should include discussion of (1) the purpose and study questions of the evaluation; (2) the economic, political and social context of the project; (3) team composition and study methods; (4) evidence/findings of the study concerning the evaluation questions (5) conclusions drawn from the findings; (6) recommendations based on the study findings and conclusions, stated as actions to be taken to improve project performance. Ideally, the report should not exceed 40 pages length.

Appendices should include a copy of the evaluation scope of work, the most current Logical Framework, a list of documents consulted, and individuals and agencies contacted. Additional appendices may include a brief discussion of study methodology and technical topics if necessary.

A complete draft of the evaluation report must be delivered to A.I.D. project management no later than June 15. The final draft should be delivered within 30 days of receipt of comments on the first draft from A.I.D. project management.

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project: From FY 85 to FY 92
Total U.S. Funding \$61: \$7,295,000
Missions \$12,138,000
Date Prepared: March, 1985

Project Title & Number: Communication for Technology Transfer in Agriculture (CTTA): 936-5026

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																		
<p>Program or Sector Goal: The broader objectives to which this project contributes: To develop the use of educational technology and communications to support development objectives across sectors.</p> <p>Project Purpose: To develop and demonstrate a more effective communication support system for technology transfer in agriculture.</p> <p>Outputs:</p>	<p>Message of Goal Achievement:</p> <ol style="list-style-type: none"> 1. Implementation of the approach and procedures developed under this project to LDCs not originally included in this project. 2. The acceptance of the approach by other donor agencies and development professionals. 	<ol style="list-style-type: none"> 1. Requests for IA resulting from project publications and seminars. 2. Incorporation of the approach in Mission projects and in recommendations by other donor agencies to their field reps. 	<p>Assumptions for achieving goal/target:</p> <ol style="list-style-type: none"> 1. The availability of appropriate agricultural technology and collaborating institutions at participating sites. 2. Continued interest on the part of development professionals in the use of communications to support tech. transfer in agriculture. 3. That the use of improved communication support can make a difference in technology transfer at the sites selected. 																		
<p>Impact will be evident: 1) in the development of effective procedures for providing communication support for technology transfer; 2) in the production performance of the farmers in the pilot sites; 3) in organizational changes in the collaborating institutions; 4) in the diffusion of the communication methodology to additional sites; and 5) in modification of the accepted norms for conducting extension among the international community. Specific outputs include:</p> <ol style="list-style-type: none"> 1. Pilot activities at 9 sites to develop a more effective communication support system for tech. transfer. "Developmental" and "networking" procedures will be produced. 2. Summative evaluations of these 9 activities. 3. In-service training and institutionalization of procedures at each site. 4. Significant technology transfer at each site. 5. Diffusion seminars and TA Mission. 6. Instructional manual and videotape series. 7. Reports, publications and papers. 	<p>Conditions that will indicate purpose has been achieved: End of project status.</p> <ol style="list-style-type: none"> 1. The development of procedures for the effective use of communication for technology transfer in agriculture. 2. The integration of these procedures in the on-going research/extension systems of participating LDCs. 3. The completion of diffusion activities and distribution of publications/manual/videotape. 4. The interventions will be of at least 3-years duration in 9 countries. 5. 3 to 5 HC personnel will receive in-service training at each site; key procedures will be institutionalized at each site. 6. 12 diffusion seminars/TA Missions will be conducted; 1 instructional manual & 3 videotapes; at least 20 publications/papers presenting 	<ol style="list-style-type: none"> 1. Program management data. 2. Evaluations at each site which include in-depth interviews with members of the target audience and agricultural workers to assess project implementation knowledge, practices and yields and to assess institutionalization of the procedures. <p>Same as above.</p>	<p>Assumptions for achieving purpose:</p> <ol style="list-style-type: none"> 1. That the commitment and ability to participate in the project and provide collaborating professionals and equipment remains constant. 2. That natural disasters, economic failure, or war to not prevent the conduct of project interventions and evaluations. 3. That the R&D produces successful procedures. 4. That proj. impact is successfully measured. <p>Assumptions for achieving outputs:</p> <ol style="list-style-type: none"> 1. Full-time participation of key HC counterpart personnel. 2. Cooperation of line personnel of collaborating organizational units. 3. Availability of HC media production and distribution facilities; radio air time. 																		
<p>Inputs: Funding and TA to conduct and evaluate interventions in 9 LDCs and provide in-service training required. Funding to conduct the diffusion activities.</p>	<p>Implementation Target Type and Quantity:</p> <table border="1"> <thead> <tr> <th>S&I</th> <th>Mission</th> </tr> </thead> <tbody> <tr> <td>FY 85: 400</td> <td>500</td> </tr> <tr> <td>FY 86: 1300</td> <td>1500</td> </tr> <tr> <td>FY 87: 1300</td> <td>2000</td> </tr> <tr> <td>FY 88: 1300</td> <td>3000</td> </tr> <tr> <td>FY 89: 1200</td> <td>3500</td> </tr> <tr> <td>FY 90: 800</td> <td>1500</td> </tr> <tr> <td>FY 91: 700</td> <td>138</td> </tr> <tr> <td>FY 92: 295</td> <td>---</td> </tr> </tbody> </table>	S&I	Mission	FY 85: 400	500	FY 86: 1300	1500	FY 87: 1300	2000	FY 88: 1300	3000	FY 89: 1200	3500	FY 90: 800	1500	FY 91: 700	138	FY 92: 295	---		<p>Assumptions for providing inputs:</p> <ol style="list-style-type: none"> 1. The obligation of A.I.D. funding according to plan. 2. The selection and continued functioning of competent contractors and TA staff.
S&I	Mission																				
FY 85: 400	500																				
FY 86: 1300	1500																				
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FY 90: 800	1500																				
FY 91: 700	138																				
FY 92: 295	---																				

APPENDIX B: TEAM MEMBERS

Dr. A. J. Coutu

The team leader is associated with N.C. State University. He has participated in agricultural evaluations in Latin and Central America.

Dr. Coutu has over 25 years of experience in Agricultural Development, including long term assignments in Peru and Washington, D.C., under contracts with USAID.

As an agricultural economist, he has participated in the preparation of project identification documents, project papers, project evaluation and special study assignments with many USAID missions. He was trained at the University of Connecticut, Harvard University, Duke University and N.C. State University.

Dr. Coutu was on leave from N.C. State University to USAID/W from mid-1970 to mid-1973. He was head of a new office of agricultural sector analysis in the Technical Assistance Bureau of AID. In this office he established an administrative unit to focus on agricultural assessment methodologies, programmed a series of projects on agricultural policy analysis and implemented agricultural sector assessment and planning programs in South Korea, Thailand, Mexico and other locations.

He has taught courses in economic development, production, economics and economic principles as well as being a contributor to the development literature with a book on Peru, many papers and journal articles. He also serves as the coordinator of a long-term agricultural service development project in Peru and as a research coordinator on the APAP II project along with participation in agricultural science projects in Costa Rica and Uruguay.

John B. O'Donnell

Mr. O'Donnell is an A.I.D. Senior Foreign Service Officer with over 25 years experience in agricultural and rural development programs in Latin America and Southeast Asia. He is currently serving as Deputy Agency Director for Human Resources in the Science and Technology Bureau of AID.

Since 1971, Mr. O'Donnell has specialized in Latin American programs with assignments as Chief of the Office of Agriculture and Rural Development in Peru (1977-82) and Ecuador (1985-87) and Deputy Chief in Guatemala (1974-77). He was also Deputy Director and Acting Director of the Office of Rural and Institutional Development in the Science and Technology Bureau (1982-85), Supervisory Program Analyst in the Latin American Bureau (1971-73) and recipient of AID sponsored graduate training in Agricultural Economic and Regional Planning at Cornell University (1973-74).

From 1962 to 1970 Mr. O'Donnell held various AID positions related to agriculture and rural development in Vietnam, Thailand, and Peru. He also served as A.I.D. Officer-in-Residence at the Asia Training Center in Hawaii (1966-69) directing rural development training programs for AID officers

assigned to Southeast Asia.

During his AID career, Mr. O'Donnell has designed, managed and evaluated a wide range of agriculture and rural development projects including a number in agricultural research, extension and education, agricultural policy and planning, agricultural marketing and regional development, cooperative development and nature resources management.

He graduated from Stanford University in Economics and History and did graduate study in Economic and Agricultural Economics at Cornell and the University of Hawaii.

Dr. Constance M. McCorkle

Dr. Constance M. McCorkle has 17 years' experience in international research and development, spanning some 20 countries of Latin America and Africa, and including several long-term assignments in Peru and short-term consulting in Honduras. She has participated in the preparation of USAID project papers, project identification documents, and a variety of project evaluations (mid, final, internal).

A faculty member in the Department of Rural Sociology at the University of Missouri-Columbia, Dr. McCorkle also coordinates the Sociology Project of the Small Ruminant Collaborative Research Support Program, which operates in Brazil, Indonesia, Kenya, Morocco, and Peru.

Dr. McCorkle holds a Ph.D. and a M.A. in anthropology from Stanford University, plus a second Stanford M.A. in linguistics with a specialization in sociolinguistics. Her undergraduate studies were done at Rice University and the University of Madrid, Spain.

Dr. McCorkle's research interests are wide-ranging and interdisciplinary. She has worked in a variety of topics in the sociology of language and applied linguistics, gender and sex-equity issues, bilingual education, and communications. However, her primary research and teaching activities center on international agricultural development, with major concerns in: farming systems research; qualitative methodology; rural community development, quality of life, and equity issues; appropriate technology and indigenous knowledge systems; cultural ecology; theories of development, development policy-making, and program management; the roles of social scientists in international R&D; and the structure of training programs for students of all disciplines planning careers in international arenas.

Dr. McCorkle has lectured, published, conducted research, and/or advised development programs in all these areas. She has authored 15 articles and book chapters, edited several anthologies on agricultural development, and is presently at work on a scholarly text on peasant agriculture in Peru.

APPENDIX C: PERSONS CONTACTED:

--- U.S. ---

David Bathrick, Director, ~~USAID S&T~~ ^{Office of} Agriculture, ~~S&T Bureau~~, AID/W
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 Eric Chetwynd, Director, ~~USAID S&T~~ Rural Development, ~~S&T Bureau~~, AID/W
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 Carlos Bohl, ^{Advisor} ~~Assessor~~ FUNDEAGRO/Lima
 Antonio Chavez, Executive Technical Director, INIAA/Lima
 Martha Cruz, CTTA/Peru
 Castor Cuentas, Director, CTTA/Puno
 Guillermo Erasquin, IEE Project Coordinator ~~Project to IEE~~ and ATT Project Director, INIAA/Lima
 Ramon Espinoza, Director, CTTA/Huaraz
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 Rudy Griego, ~~USAID~~ Chief of Agriculture ^{Division} and CTTA Project Officer, USAID/Peru
 Alejandro Hurtado, CTTA/Peru Radio Programmer, Huaraz
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Misael Bueso, MNR National Director of DCA-CTTA
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Luis Fuentes, Subdirector of MNR's DCA
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Orly Garcia, MNR National Agricultural Research Assistant
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Hearne, Peter, USAID LUPE
Augustin Herrera, DCA Radio Producer (and voice of Ing. Martin)
Felipe Mantequa, USAID PSP/Guatemala
Menelio Maradiaga, MNR Regional Director, Olanchito
Juan Blas Melendez, Head, DCA Adaptation of Contents Section
Marvin Melendez, Agricultural Communication Specialist, Olanchito Extension
Jose Montenegro, MNR Vice Minister
Milton Munoz, CTTA/Honduras Project Director
Roberto Paz, MNR Regional Director, Comayagua
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Tito Salinas, Head, DCA Communications
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Miguel Angel Soler, formerly MNR Regional Director, Comayagua
Melissa Stephens, USAID Development Finance Officer
Laura Suazo, EAP Zamorano student and Programa Desarrollo Rural trainee,
Comayagua
E. J. Szepesy, USAID Acting Deputy Director
Roberto Villeda, MNR Technical Advisor
Carmen Zambrana, USAID Program Officer
Raul Armando Zuniga, Instituto Nacional de Vivienda Extensionist to Co-op
Primero de Mayo

APPENDIX D: BIBLIOGRAPHY

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