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

RCCAP

PROJECT PAPER

AGRICULTURAL RESEARCH AND INFORMATION SYSTEM

AND

SMALL FARM PRODUCTION SYSTEMS

LAC/DR:79-1

Project Number: 596-0048
596-0083

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE)

PP

2. DOCUMENT CODE: 3

3. COUNTRY/ENTITY: ROCAP - CENTRAL AMERICAN REGIONAL

4. DOCUMENT REVISION NUMBER: 5

5. PROJECT NUMBER (7 digits): 596-0048

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7. PROJECT TITLE (Maximum 40 characters): AGRICULTURAL RESEARCH AND INFORMATION SYSTEM

8. ESTIMATED FY OF PROJECT COMPLETION: FY 81

9. ESTIMATED DATE OF OBLIGATION (Extension Period only): A. INITIAL FY 79; B. QUARTER 2; C. FINAL FY 81 (Enter 1, 2, 3, or 4)

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 -)

A. FUNDING SOURCE	Extension Period First FY 79			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	225	275	500	720	748	1468
(GRANT)	(225)	(275)	(500)	(720)	(748)	(1468)
(LOAN)	( )	( )	( )	( )	( )	( )
Grantee 1. IICA		214	214		977	977
2.						
HOST COUNTRY						
OTHER DONOR(S)						
TOTALS	225	489	714	720	1725	2445

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY 75-78		H. 2ND FY 79		K. 3RD FY 80	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	200 B	200		1929		500		758	
(2)									
(3)									
(4)									
TOTALS				1929		500		758	

A. APPROPRIATION	N. 4TH FY 81		O. 5TH FY ___		LIFE OF PROJECT	
	C. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN
(1) FN	210				3397	
(2)						
(3)						
(4)						
TOTALS	210				3397	

12. IN-DEPTH EVALUATION SCHEDULED: MM 09 YY 79

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA, BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 (1 = NO, 2 = YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Harry Ackerman

TITLE: Director, ROCAP

DATE SIGNED: MM 12 DD 27 YY 78

15. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM 01 DD 25 YY 79

AID 1330-4 (3-76)

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT PAPER FACESHEET

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE) — PP

2. DOCUMENT CODE: 3

3. COUNTRY ENTITY: ROCAP - CENTRAL AMERICAN REGIONAL

4. DOCUMENT REVISION NUMBER:

5. PROJECT NUMBER (7 digits): 596-0083

6. BUREAU/OFFICE: A. SYMBOL: LAC; B. CODE: 05

7. PROJECT TITLE (Maximum 40 characters): SMALL FARM PRODUCTION SYSTEMS

8. ESTIMATED FY OF PROJECT COMPLETION: FY 83

9. ESTIMATED DATE OF OBLIGATION: A. INITIAL FY 79; B. QUARTER 2 (Enter 1, 2, 3 or 4); C. FINAL FY 83

10. ESTIMATED COSTS ($000 OR EQUIVALENT $1 -)

A. FUNDING SOURCE	FIRST FY B. FX	FIRST FY C. L.C	FIRST FY D. TOTAL	LIFE OF PROJECT E. FX	LIFE OF PROJECT F. L.C	LIFE OF PROJECT G. TOTAL
AID APPROPRIATED TOTAL	500	440	940	4374	3029	7403
(GRANT)	500	440	940	4374	3029	7403
(LOAN)						
Grantee 1. CATIE	200	174	374	1465	1471	2936
2.						
HOST COUNTRIES		1561	1561		7805	7805
OTHER DONOR(S)	370	48	418	2114	279	2393
TOTALS	1070	2223	3293	7953	12584	20537

11. PROPOSED BUDGET APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY 80 GRANT	H. 2ND FY 80 LOAN	K. 3RD FY 81 GRANT	K. 3RD FY 81 LOAN
(1) FN	211B.	023		940		1665		1665	
(2)									
(3)									
(4)									
TOTALS				940		1665		1665	

A. APPROPRIATION	N. 4TH FY 82 O. GRANT	N. 4TH FY 82 P. LOAN	Q. 5TH FY 83 R. GRANT	Q. 5TH FY 83 S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) FN	1665		1468		7403	
(2)						
(3)						
(4)						
TOTALS	1665		1468		7403	

12. IN-DEPTH EVALUATION SCHEDULED: MM 01 YY 79

13. DATA CHANGE INDICATOR. WERE CHANGES MADE IN THE PID FACESHEET DATA BLOCKS 12, 13, 14, OR 15 OR IN PRP FACESHEET DATA, BLOCK 12? IF YES, ATTACH CHANGED PID FACESHEET.

1 (1 = NO, 2 = YES)

14. ORIGINATING OFFICE CLEARANCE

SIGNATURE: Harry Ackerman

TITLE: Director, ROCAP

DATE SIGNED: MM 12 DD 27 YY 78

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AID 1330-4 (3-76)

REGIONAL CENTRAL AMERICAN AGRICULTURAL RESEARCH AND INFORMATION PROGRAM

Project 596-0048 (Agricultural Research and Information Systems)
Project 596-0083 (Small Farmer Production Systems)

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1/ On file at ROCAP

B. RECOMMENDATIONS

1. Regional Agricultural Research and Information Strategy

(a) Approval by the LAC Bureau DAEC of an A.I.D. framework of regional cooperation in Central America and Panama in agricultural research and information utilizing the specialized services of the Interamerican Institute for Agricultural Sciences (IICA) and the Tropical Agricultural Research and Training Center (CATIE) in close cooperation with related national agricultural research efforts assisted and supplemented, as appropriate, by bilateral A.I.D. Missions and other donors.

2. Project 596-0048 - Agricultural Research and Information System

(a) Approval of the project extension described herein for an additional cost to A.I.D. of $1,468,000 (to be added to the $1,929,000 previously authorized for this project), for a total cost to A.I.D. of $3,397,000 in food and nutrition funds.

(b) Approval of the extension of the project activity completion date by 27 months to June 30, 1981.

(c) Notification to Congress of the above actions.

(d) Authorization of FY 1979 funding of $500,000 to ensure continuity of support for project activities.

(e) Waiver of source/origin requirements to allow procurement of services in Code 941 countries.

3. Project 596-0083 - Small Farmer Production Systems

(a) Approval of the project described herein for a total cost to A.I.D. of $7,403,000 in grant funds (Food and Nutrition).

(b) Approval of a 54-month project period with a project activity completion date of September 30, 1983.

(c) Notification to Congress of the above actions.

(d) Authorization of FY 1979 funding of $940,000 to provide the A.I.D. contribution to first year activities.

(e) Waiver of source/origin requirements to allow procurement of services in Code 941 countries.

C. SUMMARY DESCRIPTION

1. Grantees:

Project 596-0048 - Interamerican Institute of Agricultural Sciences (IICA).
Project 596-0083 - Tropical Agricultural Research and Training Center (CATIE)

2. Program Summary

The program described herein supports a regional agricultural research strategy that supports efforts by the countries of Central America and Panama to improve the conditions in which the rural poor will have increased outputs and income from the land they work.

IICA will provide assistance to improve the collection, analysis and use of relevant small farm data on which improved research and planning action can be taken nationally and regionally in Central America. In this effort, IICA will work closely with regional and national institutions in Central America and Panama to: (a) upgrade the quality of rural sector socio-economic, research and technological information, and orient that information toward meeting the needs of the rural poor; (b) standardize and improve national agricultural information services, increase the interchange of appropriate numerical data and documentary information among national agencies and increase the effective use of that data and information in formulating policy and in developing programs and services to benefit the rural poor; and (c) improve the transfer of useful scientific and technological information to agricultural planners, service organizations, and researchers.

For its part, CATIE will develop within the region the capability to conduct and convey to small farmers crop, animal and mixed production systems research. In this effort, CATIE and national research institutions in Central America and Panama will undertake a regional program of agricultural research which: (a) places priority on the special needs of small farmers; (b) focuses on the whole farm system of the small farmer and the interrelationships among technology, service institutions, and economic, social, and cultural factors affecting small farm agriculture; (c) makes extensive use of field testing on small farmer plots to adapt basic research to local conditions; and (d) places special emphasis on developing methodology for dissemination of research results and recommendations to other small farms in the vicinity and in other similar areas of small farmer agriculture in Central America and Panama.

II. PROGRAM AND DESCRIPTION

A. BACKGROUND AND STRATEGY

This project paper proposes AID funding for two ROCAP regional projects - Agricultural Research and Information Systems (596-0048) and Small Farmer Production Systems (596-0083). Both are proposed for implementation in Central America and Panama.

The former is an on-going project known in C.A. as PIADIC (Programa de Información Agropecuaria del Istmo Centroamericano) for which an extension of 27 months through June 1981 is proposed. It is implemented through the Interamerican Institute for Agricultural Sciences (IICA). The second activity is a new 4-1/2 year project, to begin in FY 79, with the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica.

Both projects work closely with on-going research efforts of regional and national agencies in Central America and Panama. Given the increasing activity in each country in small farm related agricultural research, and increasing USAID activities in support thereof, AID/W requested and participated in development of a proposed Central American Agricultural Research Strategy which would attempt to interrelate these regional and national activities. In addition, AID/W requested that the two proposed ROCAP projects be joined conceptually. Accordingly, this PP includes the "strategy" which was developed in consultation with C.A. USAIDs, as well as a description of both activities within its framework.

Central American Agricultural Research Strategy

The following quotes the relevant sections of the research statement developed by AID/W and reviewed and commented upon by the C.A. USAIDs:

> "The Role of Agricultural Research. Central America is well characterized as a single, multi-dimensional agricultural region where areas or fields of investigation commonly carry over to most if not all of the six Isthmian countries. For agriculture production, the basic research system consists of CATIE and the several national research agencies, some of which are in the process of formation. The ag research system is a network of institutions and programs with links between the world supply of knowledge and the small farmer target groups of the USAIDs and the CA Governments. The connecting links in this process are the several national research and extention systems, and other less formal and/or private sector outreach mechanisms. Throughout the region there is widespread recognition that effective extension or outreach, is critical to utilization of research and economic change, and that the deficiencies in this area are tremendous. Judging from the allocation of Central American government and USAID project resources as well as commentary on the outreach problem, a fair part of the outreach problem

can be attributed to the lack of research results appropriate for the small farm enterprise. A more effective flow of research information suitable for small farm enterprises is required in all six countries."

"A Strategy for Ag Research. Because of the nature of the C.A. small farm agricultural problems, we recommend a research strategy that involves:

1. Acceleration of the adaptation of world ag knowledge to the C.A. small farm context through a strengthened CATIE organized to produce improved technology for small farm systems.

2. Improved flow of information between CATIE and the national research and extension programs with CATIE providing recommendations of improved technology for field testing and the national programs providing CATIE field test performance data and also requesting CATIE specialized attention to additional problem areas.

3. Encourage national systems to strengthen the outreach and field trial functions within their organizations, relying on CATIE collaboration for regional research. Emphasize the on-farm field trial demonstration of improved technologies with receptive small farmers as the primary extension mechanism. Encourage national extension services to collaborate with non-formal outreach systems in their respective countries; the Guatemala Basic Village Education System is an example of this mechanism.

4. Continue strengthening the feedback of problem identification information to the research system from the area frame sample.

5. Leave remaining activities to national level development programs."

AID/W then recommended that the two ROCAP activities be structured as follows:

"1. PIADIC: Transfer to national programs or phase-out in an orderly way the market news and the tech pack work. Those USAIDs wishing to continue these sub-projects in their respective countries should advise ROCAP of the earliest practicable bilateral financing availability. Limit the regional funding of the centers and systems work to that which feeds into the research problem identification system. Leave multi-mass media TA to national programs. Increase funding and staffing for the area frame sample development so that this feedback

system is functional at the earliest possible time for agricultural production and light capital technology."

"2. CATIE: Continue the institution-building role of the regional program and include emphasis on CATIE as a training center. Provide funding to CATIE to train Central American national researchers in interdisciplinary methods. CATIE should rely on national research/extension agencies for field testing (except for limited test plot trials). Provide for T.A. from US universities in specialized disciplinary skills that can overcome bottlenecks to tech pack production and training within the framework of the CATIE small farming system philosophy. Support the "Analogs" research effort to find models for extrapolating the existing and future stock of single discipline research results into multicrop small farmer production systems tech packs suitable to the entire range of Central American climatic conditions. This is a very complex effort and will need the best talent in ag research to bring it to fruition."

With regard to national programs, AID/W said the following:

"3. National Programs: Encourage national programs to cooperate with and build on CATIE research through extensive field testing of tech packs as a combined research/outreach mechanism. Look for other, cost effective outreach systems suitable to the country's target group. Continue to strengthen national institutions as required including provision of additional training, either at CATIE or elsewhere, as well as provision of foreign experts."

This proposed strategy outline was discussed at the 19th Mission Directors Coordinating Committee and subsequently commented upon by each USAID. There was general support for the ROCAP role envisioned and for strengthening of CATIE as a regional research institution. There was less consensus on the proposed modifications to PIADIC, with some Missions according importance to PIADIC's work in tech pack methodology and data bank development. There was general agreement that the strategy was not comprehensive as it did not address the critical area of dissemination of research to farmers.

Subsequent to these responses, a ROCAP team visited each Central American and Panama USAID to jointly explore interrelationships and seek their opinion on how each proposal could best meet USAID needs. The following proposals, therefore, reflect these considerations and have the support of the affected USAIDs. In general, the proposals fall within the general framework suggested by AID/W; however, some modifications were made in response to USAID requests and are noted in the text.

Accordingly, the proposals are designed to utilize the "comparative advantage" of two regional institutions - IICA and CATIE - in supporting an AID regional strategy of agricultural research and information which is both relevant to small farmer needs of the area (and elsewhere) as well as complementary to USAID activities in the agricultural sector. As appropriate, future ROCAP activities in this area will follow this pattern.

B. RELATIONSHIPS BETWEEN PIADIC/CATIE/NATIONAL RESEARCH EFFORTS

1. Institutional. PIADIC is part of IICA's hemispheric information system (CIDIA). As such it responds to IICA policy guidance and overall direction. IICA was located at the CATIE site until 1960. The General Directorate of IICA was moved to San Jose and the Turrialba site was maintained for training and research. In 1973 IICA and the Government of Costa Rica created CATIE. IICA retained two votes on the Board and annually contributes $580,000 to CATIE's budget. Utilization of the IICA land and facilities was passed to CATIE. Physically, both IICA and CATIE are located in Costa Rica and there is a strong bond of cooperation between the institutions. Panama and all C.A. countries are members of IICA. Panama, Costa Rica, and Nicaragua are members of CATIE (Honduras in process); however, it works in all six countries.

2. Roles. CATIE was created to promote and carry out research at different levels in agriculture, forestry, and animal husbandry for the American tropics, with emphasis in Central America and the Caribbean. CATIE's mandate was to shift emphacis from teaching to applied research corresponding to field research carried out by national institutions. IICA retained a policy guidance role and has exercised its influence to insure that IICA and CATIE programs are complementary. Traditionally, IICA has emphasized CATIE's applied research and training role, while itself providing technical assistance in the broader areas of agricultural management, policy, extension, credit, marketing, information, etc. As such, IICA seeks to have its technical assistance programs, such as PIADIC, work closely with and respond to CATIE needs, rather than encouraging CATIE to develop its own capacity in this areas. The two institutions differ markedly in their respective approaches. CATIE is an action-oriented organization with its own operational field agents in each country who carry out research and training activities both cooperatively and independently. On the other hand, IICA is a source of specialized technical assistance and training (such as PIADIC) which concentrates almost wholly on "soft ware".

3. Operational. PIADIC staff is located throughout the area. Home office technical support is located in Costa Rica (CIDIA)

and logistical and planning support is provided by IICA's North Zone office in Guatemala. The chief of the North Zone Office and the head of IICA hold two voting seats on CATIE's Board. Both individuals enjoy a wide view of the agricultural programs and needs of the area and are thus uniquely qualified to shape both CATIE and PIADIC programs to mutual advantage. However, since CATIE programs are more narrowly focused than PIADIC's, there is a greater need to relate PIADIC's broader goals to agricultural research than vice versa. Accordingly, over the next 27 months, ROCAP support to PIADIC's methodology, technical assistance, and training will be focused largely on those research and application support services which are necessary ingredients to national and regional research and planning programs, such as:

- The development and use of the area frame sample for collecting small farm/rural sector data on a continual basis. This data is crucial to CATIE and national researchers and planners to identify major problems to be overcome and evaluate and measure impact.

- The improvement of collection, organization, and management of agricultural data into a more useful and readily available form for CATIE and agricultural researchers and planners to study and characterize their work areas. This includes previous research results, both local and worldwide, methodology in research design and evaluation, and measurement of results against other conditions. Also, since researchers traditionally give little attention to putting their research data into a memory or recall system, PIADIC's data base development works to strengthen and standardize this effort to facilitate its easy storage and recall.

- The use of the data bases by researchers and planners to identify rural sector problems and select priorities, as well as integrating data from various sources into preliminary farmer recommendations for use by researchers in their field trials. These data bases are also necessary for CATIE and national agencies to determine possible analogous areas where research results and technology can be transferred with predictable results.

- The establishment of key national and regional data bases, for both documental and numerical data, with exchange capability, to make information more readily available to CATIE and national researchers and planners, as well as to provide memory and transfer channels for both local and world-wide research results.

- The strengthening of IICA to provide technical assistance and training to in-country research efforts for the foreseeable future.

For its part, CATIE will be looking to PIADIC for assistance in setting up its own small farm production system data center at

Turrialba. Also, its in-country research activities will look to PIADIC assistance in organizing the specialized data bases for CATIE use in obtaining standardized information, including site specific profiles, in CATIE areas of work on socio/economic data, market intelligence, soil/climate data for analysis, and past research results. In addition, PIADIC methodology for collection of data necessary for small farmer production recommendations is critical to CATIE's early work with national researchers. Finally, CATIE will look to PIADIC to foster the necessary liaison with national information systems and their respective agencies.

Exhibit I attached graphically illustrates the relationships among the various research entities involved in this program.

C. RELATIONSHIP TO USAID PROGRAMS

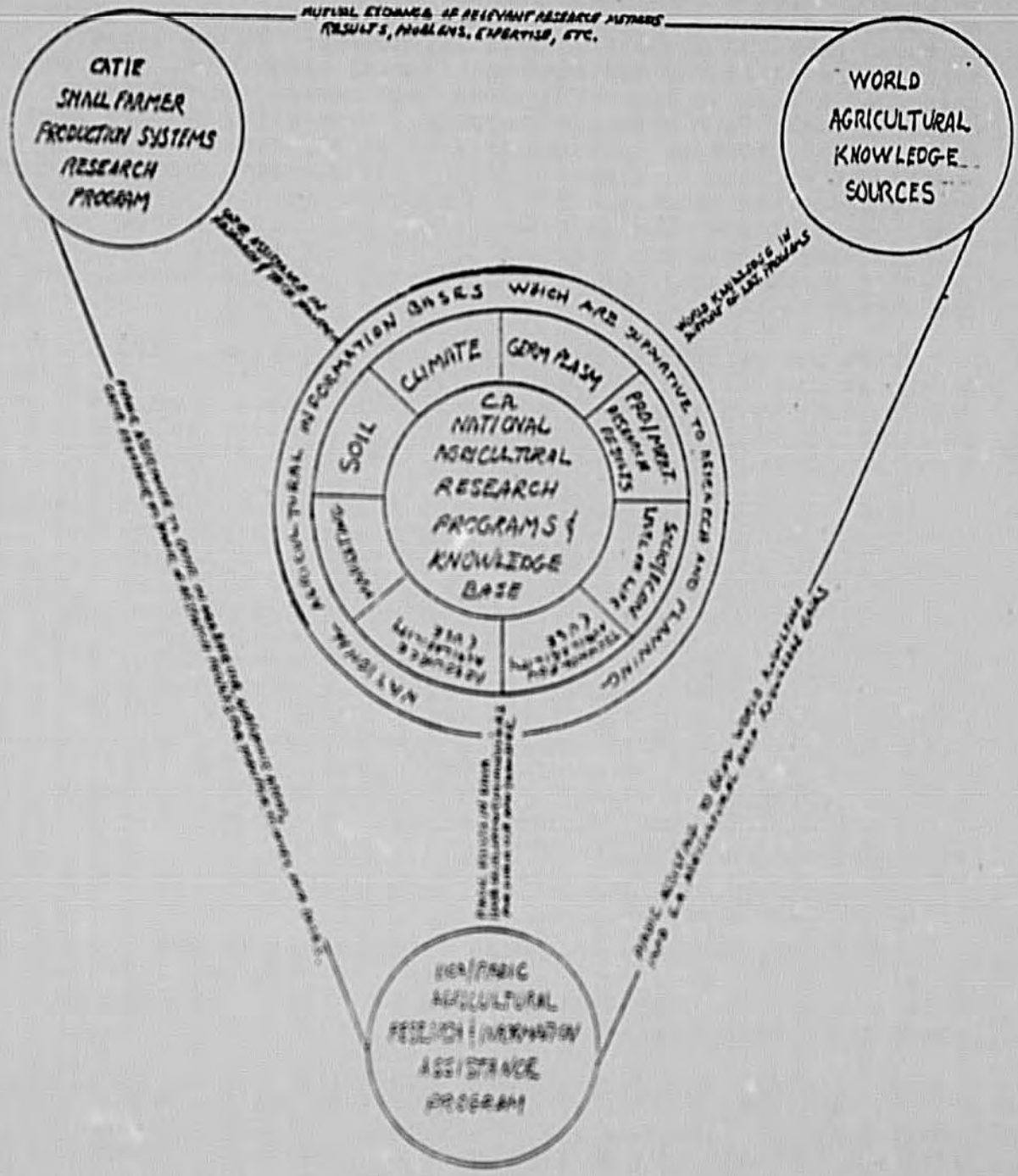
Annex XIII provides a country-by-country overview of ongoing and projected PIADIC activities. CATIE activities in each country are outlined in section D.2 (CATIE Project Description). A joint programming visit was made to all C.A. and Panama USAIDs, and each FY 80 ABS was reviewed. The proposed PIADIC and CATIE programs were explained to RDO staffs and Mission management. The approach was to use research as the conceptual starting point for discussion; however, in the case of PIADIC, wider areas of concern were addressed. In general, there was strong support for assistance to CATIE, as proposed. The work of PIADIC in area frame sampling and data improvement was given high priority by almost all USAIDs. Indeed, in three countries (Honduras, Nicaragua and Panama) the USAIDs had under study government proposals for information management projects for USAID financing which were prepared with PIADIC assistance. Costa Rica was preparing one for FY 79 funding using PIADIC assistance. Guatemala has requested PIADIC assistance to prepare one. PIADIC will continue to assist these activities through the approval stage, and will thereafter work with these efforts to complement the direct assistance therein provided. Almost all USAIDs were seriously interested in PIADIC providing standardized farmer recommendation methodology to the national agencies. Only one USAID (El Salvador) expressed strong interest in market news, and forestry was given relatively low priority by all USAIDs. Accordingly, these two areas were dropped from ROCAP funding.

All USAID on-going and proposed projects were grouped by PIADIC outputs. Annex XII provides an analysis of this effort, based upon a user or producer of information basis. There is a high degree of correlation between USAID and PIADIC activities.

With regard to CATIE, all USAIDs were aware of CATIE activities in their country and were planning, in varying degrees, on utilizing CATIE assistance. For example, USAID/ES was eliminating the multiple cropping expert from its on-going research project and was looking

Exhibit I

RESEARCH RELATIONSHIPS



to CATIE for this assitance. USAID/H's recently authorized Agricultural Research project lists CATIE as a source of technical assistance and was designed with CATIE assistance. USAID/N had no specific research proposals planned and was looking to CATIE to provide specialized technical assistance through its on-going and proposed research efforts. USAID/P was preparing an agricultural research proposal for FY 79; however, it was largely monoculture following GOP communal farming priorities. The on-going CATIE work in Panama, however, has caused the GOP to reconsider small farm multiple cropping. Meanwhile, USAID/P sees the proposed CATIE projects as filling an important and highly complementary role in Panama. USAID/CR's on-going Commodity Systems project was utilizing CATIE technical assistance. At this time, no other specific ag research proposal was planned. USAID/G is preparing a research proposal for FY 80 which will be largely oriented to the highlands. CATIE research will be largely done in the warmer climes.

There was general agreement among the affected USAIDs that CATIE, as part of its research efforts, would also perform limited and complementary research into methods of transferring its results to selected small farmers in the specific areas of its research in three countries (Honduras, Nicaragua, and Costa Rica).

Finally, there was agreement by all USAIDs that the proposed CATIE project, in many ways, was a "state-of-the-art" project attempting to introduce innovative and replicable research methods, and the USAIDs' programs (while not ignoring this aspect) would concentrate on the general strengthening of national research organizations and their outreach capabilities. CATIE work was seen as highly complementary. There was an understanding that their use of CATIE technical assistance beyond the limited amount available under the proposed regional project would require advance planning to enable CATIE to program its resources. In this regard, there was an understanding that CATIE research under this proposed regional program was already largely programmed to site-specific CATIE/national research efforts and activities beyond these efforts would require separate funding.

D. PROJECT DESCRIPTIONS

ROCAP support to agricultural research and information in the area, initially, will be provided under two regional projects. While the two are complementary, presentation is facilitated by their being described separately.

1. Agricultural Research and Information System (596-0048).

Background. This program element is implemented by the Inter-American Institute for Agricultural Sciences (IICA). In 1975 AID approved initial funding of $1.4 million to assist in

the establishment of a regional agricultural research information system in Central America, known locally as PIADIC. IICA, working closely with regional and national institutions in Central America, was to undertake a two-phase program to accomplish the following:

a) Upgrade the quality of rural sector, socio-economic, research, technological, and market trade information; and

b) Standardize and improve national agricultural information services to increase the regional interchange of appropriate data and documentary information, increase its effective use in formulating policy and develop programs in services that benefit the rural poor.

In early 1976 Panama, having observed potential project benefits, joined the program. Accordingly, the project was revised to include Panama and AID's support was increased to $1.7 million to support project activity among the six participating countries. In addition, interim FY 78 funding of $226,000 was added to extend the program through March, 1979 in anticipation of a redesign of the program to support agricultural research activities in each country per DAEC guidance in STATE 219445 (Annex IV.A).

Two evaluations have been conducted of PIADIC. The results of both evaluations have stressed that the program is valuable and necessary to the development of the rural sector in Central America, recognizing at the same time (as had initial project planners) that three years of project effort would not be sufficient time to institutionalize the activity should it arouse the requisite national and regional support. (A resolution of the region's Ministers of Agriculture acknowledging information needs is appended at Annex XVIII.A) During the execution of the project it has become increasingly apparent that PIADIC, to be successful over the long term, will need to provide continuous support to the individual national programs, which as they develop, will constitute the elements of a regional system. This view is shared by IICA and the participating countries. In this regard IICA is currently reorganizing its information programs to incorporate PIADIC within its overall information capabilities as a permanent program for the Central American region. This project extension, in addition to providing country-level support to agricultural research activities, will allow sufficient time for IICA to gain the experience and build the institutional capacity to continue support for the program beyond the life of the extension.

Following DAEC guidance, the framework of the proposed agricultural research strategy, and the priorities of the affected USAIDs, the PIADIC extension proposal has been redesigned to complement and concentrate more closely on those activities that most directly support agricultural research and related information

needs of the region. ROCAP assistance to market news is phased out and the remaining effort is directed at more research oriented market intelligence instead. The reader is reminded that, in most aspects, PIADIC is not in itself an action program; rather it is a localized and readily available source of specialized technical assistance which provides state-of-the-art and widely accepted methodology, as well as regionally relevant experience to country-level research and investigation programs. The complementarity thus induced is a major stepping stone to a regional and extra-regional information network of agricultural research and information. At the end of the 27 month extension (June, 1981), the individual country programs will have largely absorbed the methodology imparted through PIADIC and continuing assistance in this area will be supplied by IICA's permanent information division (Centro Interamericano de Documentación - IICA/CIDIA), and/or the on-going USAID and other donor supported information development programs developed in most of the countries.

The goal of this program element is to improve the regional conditions in which the rural poor will have increased outputs and income from the land they work.

The purpose is to improve the collection, analysis, and use of relevant small farm data on which improved research and planning action can be taken nationally and regionally in Central America.

OUTPUTS

PIADIC, under the project continuation, will provide technical assistance to national and regional agencies in the following areas: (a) continued and increased support in completion and refinement of the area frame in each country and its use to gain specific information in crop production, socio-economic data and market intelligence; (b) systematic gathering, storage, analysis and adaptation into twelve preliminary small farmer area specific profiles of natural production determinants, biological and technological factors, and socio-economic data; (c) the establishment of specialized key institutional centers in each country through which the above data can be stored, exchanged, and made readily available to users; (d) the establishment within IICA of a continuing capability to provide technical assistance to country and regional programs and integrate these efforts into a regional information network with exchange capability to information sources outside the region. The actual actions under each area, by country, will be geared to such factors as resources, present state-of-the-art, national priorities, institutional or donor assistance, etc.

Overall, ROCAP funds will be used by PIADIC to provide guidance, technical assistance, methodology, and training, as follows:

(a) Development and Refinement of Area Sample Frame

The area sample frame is a statistically valid, yet more cost effective technique to gather rural statistics. It provides timely and targeted information gathered at the farm site on a wide variety of factors. PIADIC will provide specialized technical assistance and in-country training to statistical and agricultural planning agencies to develop sample frames and related survey systems. Once in place, area frame sampling can provide timely reliable data at up to less than half the cost of traditional censuses. The current status of the area frame is as follows:

El Salvador. El Salvador has a complete area frame for the entire country. Three standard surveys are scheduled each year. Two of these are multi-purpose to gather data on total area planted in all crops, livestock inventories, production inputs used, grain and major crop disposition (consumed, sold, etc.), total farm production, farm-gate prices for basic and export crops, and credit availabilities, cost and use. The third survey assesses farmers' plans for planting basic grains. This information is used for the national management of grain stocks. Additionally, special surveys are conducted periodically to find out the cost of production and prices for particular crops in particular areas.

Nicaragua. Nicaragua's area frame is complete for 80% of the area in production. Nicaragua uses the sample frame in the conduct of a multi-purpose survey covering the same items as El Salvador's multi-purpose survey with the addition of information on farm labor (availability, cost, uses).

Panama. Panama's area frame is complete for the entire country. Panama uses the frame for special purpose surveys on grains, vegetables, livestock, and particular crops such as tobacco and sugar. Panama's surveys focus on commodities rather than on farms. PIADIC is helping to revamp Panama's survey techniques to focus on small farms.

Guatemala. Guatemala has constructed a frame for the Highlands area and is preparing a pilot survey to gather data on land use (crops, livestock) and also socio-economic data: family size, ages, literacy, use of labor, off-farm employment, credit sources and uses, and migrant labor patterns.

Costa Rica. Costa Rica has constructed a frame for one region of the country and is preparing a pilot survey which will be multi-purpose: area planted for all crops, total production of basic grains, land tenancy, marketing channels, off-farm grain storage capacity, and credit use and needs.

Honduras. Honduras is now constructing a frame for the southern part of the country. No surveys have yet been prepared.

Annex VII.A provides a detailed description of the PIADIC work program for each country to insure that all countries will have an operational sample frame survey system in place. PIADIC's assistance also aims at introducing standardized methodology on use of the area sample frame for collection of regionally comparable production, socio-economic, quality of life, production technology and related market intelligence data, as described below. PIADIC assistance in this area has been widely accepted by most of the C.A. USAIDs. It is regarded as the major (if not the only) source of this expertise available in the region. Under the extension, ROCAP will provide 27.5 person months of full-time U.S. technical assistance, up to 12 person months of short-term U.S. technical assistance, 23 person months of C.A. technical assistance, and related costs. IICA will provide 27 person months of full-time C.A. technical assistance and up to 12 person months of specialized short-term C.A. technical assistance.

(b) Assistance in Development and use of Key Baseline Data

(i) Ag Research and Planning Data Bases. PIADIC will develop methodologies and offer assistance in data generation, processing, analysis, and summarization for use by researchers and other agricultural sector agencies. Emphasis will be in standardization, normalization, and common site selection with agencies that work with the following types of data:

(1) Natural production determinants:
    (a) climate
    (b) soils
    (c) water

(2) Biological and technological determinants:
    (a) Germ plasm, controlled registry
    (b) research results
    (c) current production technology use

(3) Socio-economic determinants:
    (a) Resource Use
    (b) Production and marketing practices -- improvement of market intelligence on basic food crops and selected non-traditional crops, including input-output relationships.
    (c) Level of life indicators
        - employment indicators
        - population
        - health and nutrition
        - shelter
        - education and literacy
        - transportation and communication

(ii) Area Specific Profiles and Recommendations. National agencies will be assisted in the organization and application of agricultural research related information into specific area profiles, using the information gathered by the area frame and other surveys.

Area specific profiles will provide investigators and similar users with an accurate description of a given area and small farmers in terms of their: biological factors; socio-economic factors; and climatic factors; at several levels of specificity, banked by latitude, longitude, altitude, and gradient. PIADIC will provide the methodology to further define these profiles into development of twelve of what are referred to as "first approximation" small farmer recommendation documents for subsequent testing on small farms by national agencies (2 per country). Many other uses of these small farmer area specific profiles by investigation, planning and extension agencies are foreseen. This will include assisting CATIE in organizing and collecting the necessary national production baseline data needed by CATIE and national research agencies for their multiple cropping and analogous area research efforts to be financed separately.

A fundamental concern of the project is the fostering of the concepts and methodologies for development of first approximation farmer recommendations based upon work, mostly monoculture, now being done with technicians in the region. Training in this field has been provided to C.A. technicians as follows:

Country	Crop
Panama	Corn (Mechanized and non-mechanized) and pigeon peas
El Salvador	Corn, sorghum, beans and rice
Nicaragua	corn, beans, and sorghum
Guatemala	corn
Honduras	corn and beans

PIADIC will not produce what is commonly called a "tech pack", i.e. a proven set of farmer recommendations ready for dissemination. Rather PIADIC will refine and introduce methodology which enables country researchers to compile, analyze and recall available data on already accomplished research. From this flow recommendations for production systems designed and field tested by a researcher for verification and modification (perhaps several times) before it can be recommended to a farmer. Thus researchers will not start from scratch and duplication of research effort will be reduced. Also, the methodology encourages the incorporation of known results into on-going research and facilitates access by all-too-often isolated researchers into their colleages' desk bottom drawers (where much research resides, but not all belongs). This effort is significantly complementary but distinct from the work done by CATIE which builds farmer recommendations from actual on-farm research results. In effect, CATIE develops new technology on multi-cropping systems. PIADIC assists in packaging of existing knowledge. While both need to be tested, PIADIC only works on the pre-testing aspects. CATIE does actual field tests working along with national researchers. Annex VII.A provides a detailed explanation of PIADIC's approach in this area, its compatibility with

other information activities such as CRIES, relationships to CATIE work in this area, and a proposed work program.

PIADIC-assisted first approximation farmer recommendations will organize single discipline national monocrop research into area specific production systems. These also will provide information of value to CATIE's multiple cropping and mixed farming research. For example, high yielding varieties of food crops will be identified and used in multiple cropping trials. Also, pests found locally to be of economic importance will be surveyed in multiple cropping experiments. If found to be causing similar damage, the same control measures (type of pesticides and dosage) will be tested to ascertain their effect under multiple cropping situations. Too, nutritional responses to single crop plant deficiencies may indicate the situation that may evolve under multiple cropping of similar crops.

Further, data derived from PIADIC-assisted area samples and other survey data on socio-economic and production practices, developed for the area profiles, will significantly reduce the level of farm surveying needed by CATIE to design new trials utilizing multiple cropping mixed farming and animal systems. For example, economic data will indicate capital availability risk levels, income, farm gate prices and existing production techniques essential to develop improved farming systems alternatives which respond to the farmers present situation and to changing market demands. Climatic and soil data available from the profiles will indicate the system/environmental relationships within new combinations of production alternatives can or should be tested. Yields and available biomass data will be extremely important in developing animal production recommendations which can take advantage of surpluses or utilize byproducts which are presently being underutilized or wasted.

ROCAP will provide assistance to PIADIC efforts with country agencies to introduce and apply this methodology through 43 person months of US long-term technical assistance, limited US short-term technical assistance, 133 person months of C.A. technical assistance (including a rural sociologist and rural anthropologist), and related costs. In addition, limited funds will be provided to assist in expansion of on-going country surveys, specialized data processing of already collected data, and other "Piggy-back" survey actions designed to either introduce new methodology or refine data in a regionally relevant manner. IICA will provide 27 person months of full-time CA technical assistance, 13.5 person months of half-time CA technical assistance, and up to 12 person months of specialized short-term CA technical assistance.

(c) Establishment of Specialized Agricultural Data and Information Centers

Specialized information and data centers in each country will be assisted in their efforts to acquire, classify, store, recall, package and disseminate national and worldwide information in a numerical or documentated format for biological factors and production technology, market intelligence and socio-economic factors. PIADIC will also assist these key specialized centers in each country in their efforts to improve information exchange and user access and services.

Exhibit II attached shows the key agencies in each country to whom PIADIC provides technical assistance, and which taken together form a national network of agricultural information sources, documentation centers, numerical data banks, and reference centers for use by researchers and policy planners.

In addition, each country has a national committee where these agencies are represented and through which PIADIC activities are coordinated. By June 1981, a "network" will be operating in each country with at least three of the above institutions cooperating in the use of standardized methodologies for control, memory, analysis, interchange and use of information relevant to researchers and planners.

The following are major planned activities with all six countries participating:

1. Project technicians will continue to assist the national committee and national agencies to prepare specific country programs that define key agency roles and functions and develop National Ag Information Systems.

EXHIBIT II

	MARKETING AND COMMERCIALIZATION	BIOLOGICAL & PRODUCTION TECHNOLOGY	SOCIO-ECONOMIC/ STATISTICS	SECTOR DATA BANKS	NATIONAL REFERENCE CENTER
COSTA RICA	CNP OPSA	MINAG Univ. Costa Rica Nat. Aut. Univ.	OPSA Censos Fac. Econ.	OPSA	Polytecnic - Cartago
EL SALVADOR	Dir. de Econ. Agric. INA Dir. de Fomento de Comercio	Fac. de Agron. CENTA	Dir. Econ. Agric. MAG	Dir. Econ. Agric. MAG	OEA Science & Tech. Program
GUATEMALA	INDECA	ICTA Fac. Agron. ICAITI INCAP	USPA	USPA	Planning Ministry
HONDURAS	SRNN IHMA	SRNN Fac. Agron. Es. Pan Am. UNAH Banco Central	SRNN	SRNN	Banco Central
NICARAGUA	INCEI DIPSA	INTA INVIERNO IAN Banco Central	DIPSA Censos	DIPSA	DIPSA
PANAMA	IMA	IDIAP Fac. Agron.	Censos	Censos	Min. Planning CEDECANI

2. National agricultural information (Program) coordinators will be assigned, trained and will begin work.

3. PIADIC will assist in selecting priorities and will provide training for national level technicians in the priority functions of documentary and numerical data management, control, analysis, and packaging for specific users and for data and information transfer.

4. PIADIC technicians will assist national technicians to develop a national thesaurus of information sources and put it to use.

5. Project technicians will provide technical assistance and training to establish systematic standardized documentary and numerical data management, control, analysis and packaging of priority data bases for specific users.

6. Project technicians will assist national agricultural information centers staffs to understand the effective procedures for interchanging information among agencies within country, with other C.A. countries and with appropriate regional organizations.

ROCAP will provide up to 8 person months of US short-term technical assistance, funds for complementary survey activity, and 23 person months of C.A. technical assistance and related costs. IICA will provide 27 person months of full-time C.A. technical assistance, 13.5 months of half-time C.A. technical assistance, and up to 12 person months of specialized short-term technical assistance. In addition IICA will provide necessary assistance to national and regional committees for coordination and communication.

(d) Regional Information Technical Assistance by IICA

IICA is the regional center of the Interamerican Information System for Agricultural Sciences (AGRINTER) for regional and world-wide exchange of agricultural science and technology information. PIADIC also cooperates with information centers in ICAITI, SIECA, INCAP, CIMMYT, and CIAT. IICA is also institutionalizing its capability to provide technical assistance to national and regional information programs after project completion.

Since its inception this project has aimed at the development of a regional information system embodied in regional data banks. Such an end result, however, will depend upon standardization at the national level. Thus regional data banks are dependent upon well-designed and smoothly functioning national information systems which are collaborating and are interchanging information with key agencies serving the region (ICAITI, SIECA, INCAP, CATIE, CABEI, etc.). IICA has reorganized to incorporate the project within its on-going document and information center (CIDIA) which hopefully

will become one of the dynamic centers serving the region. Thus, the conditions will exist, at the appropriate time, for national efforts to be linked to such extra-regional systems as FAO's AGRINTER and Mexico's CONOCIT. Accordingly, project emphasis will remain on improving the quality of information and on standardization at the national level (providing the six countries the capacity to exchange information with regional agencies). At that level, systematic documentary and numerical data management is now established in at least three information centers in each country. Methodologies for integrating these key agricultural information services into a specific national network of operational projects have been developed, approved, and implementation begun in four countries.

This is a long-term (and continuous) process. ROCAP assistance to this effort is both policy and technically oriented (project manager) and comprises 27 person months of continuous resident US technical assistance and related costs. IICA will provide 27 person months of full-time technical and project management assistance and 10 person months of half-time technical assistance. In addition, IICA will provide their facilities and equipment in all six countries for supporting project implementation and related supplies and maintenance. At the country level, we estimate national contributions of approximately $200,000 for planning and coordinating activities, excluding the direct costs of in-country programs which are recipients of PIADIC technical assistance.

TOTAL INPUTS

AID-contributed inputs will include 301 person-months of US and third-country technical assistance, operational support for the PIADIC team, complementary support to in-country surveys, one vehicle, and one copying machine. IICA-contributed inputs include 181 person months of technical assistance, project staff facilities in six countries, and administrative support. The participating regional and national agencies will contribute human and natural resources of the national information networks with which PIADIC works. (See Annex X.A.2 and 3 for details)

2. Small Farm Production Systems (596-0083)

Background. This program element is implemented by the Tropical Agricultural Research and Training Center (CATIE) located in Turrialba, Costa Rica. It follows the successful work performed by CATIE over the past four years, under a previous ROCAP project (596-0064), in the groundbreaking field of intercropping research and development of multidisciplinary small farmer recommendations for on-farm use. The most recent evaluation reported that "the... project must be considered the leading program in the Americas in terms of its emerging conceptualization of research methodologies for small farm cropping systems." Annex VII.B describes the scope and preliminary research results of CATIE's small farm cropping systems research in Central America. ROCAP believes that this experience has established the technical, administrative and operational foundation upon which to build the proposed project, which represents a considerable expansion of CATIE expertise and influence in Central America.

The role of CATIE vis-a-vis national research institutions is addressed in the proposed regional agricultural research strategy. CATIE currently has general agreements with key national agencies. Under these, core staff at CATIE develops new methodologies for systems research and, through its resident staff in each country, collaborates with national research institutions in the design, execution, and analysis of on-small farm research. Fourteen joint research sites are operating throughout the region on over 100 small farms and having demonstrable impact on almost 2000 neighboring farms.

Summary Project Description

The proposed project will significantly expand CATIE's research activity, increase CATIE's core staffs' scope and breadth, as well as correspondingly widen CATIE's resident staff in each country. This regional expansion in scope and wider cooperation with national agencies follows the recommendations of the proposed regional agricultural research strategy. In addition it implements the recommendations of the June 1978 IBRD working paper "Agricultural Research and Farmer Advisory Services in Central America and Panama"1/ which, inter alia, stressed the need for a systems approach to small farmer research which took into account all small farm activities, called for increased interaction between researchers and transfer agents at the small farm level, and strongly recommended seeking opportunities for greater efficiencies through regional research of common interest to all countries.

The proposed project will extend CATIE's current research methodology and field work towards complete farming systems, i.e. take into account the physical environment and socio-economic

1/ Known as the Tripartite Study, done in cooperation with IDB and AID.

conditions in the design of appropriate alternative production systems (including crops, animals and mixed crops and animal farming) as well as the investigation of ways to apply the results of research conducted in one area to similar areas elsewhere in the region, thus minimizing the repetition of field experimentation and related additional costs of research. The project will also address the equally challenging but essential task of evaluating alternative methods for delivering proven research results to small farmers in a way conducive to their acceptance and use. This paper justifies the project in terms of four key factors:

- improvement of small farmer welfare;
- intensified use of the most abundant factor of production on small farms: unemployed and underemployed labor in situations where both land and capital are scarce;
- reduction of risk and uncertainty as a constraint to small farmer adoption of new initiatives;
- improvement of the small farmers' limited resource productivity on which his welfare depends.

The project is experimental and innovative, seeking to establish new approaches to the solution of old problems. To the extent it is successful, it will open new doors for bilateral assistance to national programs built upon project experience and developed methodologies. It will also leave a regional institutional capacity for continued technical assistance with lessened need for extra-regional technical assistance.

The project, to begin in 1979 for a four and one-half year period, will include studies and on-farm research by CATIE in coordination with the national research institutions of Central America to: (1) identify agricultural production systems used by small farmers, characterize the ecological, climatic, and sound economic factors in small farmer regions, and identify factors limiting production; (2) develop improvements to traditional systems used by small farmers to increase the productivity of the land through improved cropping, animal production and mixed systems which optimize and conserve the resources available; (3) develop a methodology to transfer proven research results to similar areas with minimal expense and duplication of effort; (4) carry out research into the means by which small farmers can use the improved systems; (5) train national technical personnel to conduct multi-disciplinary research; and (6) develop a coordinated focus of multi-disciplinary research at the national level and coordination of activities in all the Central American countries. In addition to development of methodologies, a major output of the project will be tested and tried recommendations for new small farm crop-animal options which will improve management practices in terms of yield or net income in comparison with traditional systems.

In order to assure that appropriate technology will be the product of the field research, experiments will be conducted almost exclusively on small farms, preceeded by socio-economic, technological and ecological surveys in each study area to characterize the existing status of the small farm situation. From these Baseline studies, research interventions will be undertaken on those elements which have the most favorable potential to increase small family income, generate increased profitable employment and significantly increase food production. In order to assure relevance of this research to the small farmers' situation, the principles to be adhered to in selecting research interventions will involve those which are low cost, require a cost effective minimum of purchased inputs and increments of change compatible with existing small farm production.

Detailed Description

The goal of this project, shared with project 396-0048, is to improve the regional conditions in which the rural poor will

have increased outputs and income from the land they work.

The purpose is to develop a continuing Central American expertise to conduct and convey small farmer crop, animal, and mixed-farming production systems research.

OUTPUTS

CATIE activities under the project are summarized in Exhibit III. There are four major outputs:

1. Develop methodologies for farm level research in multiple crop farming, mixed multiple crop and animal farming, and animal farming for small farms on thirty-six sites in Central America;

2. Development of methodology for extrapolating of cropping systems research from area to similar areas, and by multiple production factors (i.e. variation of one production factor over several environments);

3. Develop a model for the transfer of production recommendations to the small farm; and,

4. Provide graduate, in-service, and short course training in small farm systems and information transfer research.

The exhibit outlines the scope and location of these activities as they relate to CATIE and the national research and transfer agencies.

Under the project, CATIE will sign working agreements with the major national research organization in each country outlining the objectives and obligations of each party over a four year period. An informal translation of the relevant sections of this working document[1/] describes the objectives of the agreement and obligations of each party, as follows:

"Objectives

"(a) Carry out studies to identify agricultural production systems used by small farmers, characterize the ecological, climatic and sound economic factors in small farmer regions, and identify factors limiting his/her production."

"(b) Develop joint research activities to improve the traditional systems used by small farmers, increase the productivity of the land, and consequently increase production, income, employment opportunities, and level of life and nutrition of the small farmer and his/her family."

"(c) Develop improved cropping, animal production and mixed systems which optimize the use and at the same time conserve the

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1/ Copy of standard agreement on-file at ROCAP.

EXHIBIT III

SMALL FARM PRODUCTION SYSTEMS
PROGRAM SUMMARY - CATIE ACTIVITIES

	Research Application	Processing of Results	Research Analysis	Draft Farmer Recommendations	Diffusion of Recommendations	Evaluation of Impact on Farmers
1. Develop methodologies for farm level research in:						
a. Multiple crop farming	12 locations (2 per country)	in country at CATIE	in country at CATIE	in country	to nat.res. & ext. service	at research sites only
b. Mixed multiple crop and animal farming	12 locations (2 per country)	in country at CATIE	in country at CATIE	in country	to nat. res. & ext. service	at research sites only
c. Animals for small farming	12 locations (2 per country)	in country at CATIE	in country at CATIE	in country	to nat. res. & ext. service	at research sites only
2. Development of methodology for extrapolation of cropping systems research from:						
a. Area to area	ES, Nic, Hond.	at CATIE	at CATIE	at CATIE	to nat. agencies if successful	in future
b. Multiple production factors	ES, Nic, Hond.	at CATIE	at CATIE	at CATIE	to nat. agencies if successful	in future
3. Develop a model for the transfer of production recommendations to the small farm	CR, NIC, Hond. (2 locations each)	in country	at CATIE	N/A	to nat. agencies if successful	in future
4. Provide Training:						
a. Graduate	11 M.Sc. Farm Sys.	yes	yes	N/A	no	N/A
b. In-Service	Farm Sys.	yes	yes	yes	no	yes
	Info trans.	yes	yes	if successful	yes	yes
c. Short course	Farm Sys.	yes	yes	yes	no	yes
	Info trans.	yes	yes	if successful	yes	yes

the natural resources available to the small farmer."

"(d) Study and develop the means by which the small farmer uses improved systems through research into channels of communication most appropriate to the local conditions of technology transfer agencies."

"(e) Train national technical personnel in the conduct of multidisciplinary research, development of small farmer production systems, and the analysis and interpretation of results."

"(f) Develop a coordinated research effort at the national level and support the coordination of activities under the project with other coutries of the Central American Isthmus."

The obligations of the national institutions include:

"(a) Integrate, within their regular programs, research in the area of small farm production systems, and exert necessary efforts to insure their continuity."

"(b) Designate a national technical coordinator to represent the institution in the operating aspects of the program."

"(c) Assign, as so far as possible, the human, infrastructure, and budgetary resources necessary to complement the program."

"(d) Organize a technical committee, comprised of national researchers,whose normal functions will be to determine and promote research activities within national production systems. This committee will also be in charge of liaison with other national institutions related to the program."

"(e) Promote and stimulate the training at different levels of national technical personnel related to the program."

"(f) Assign to the National Director of Research, the responsibility of technical coordinator, to represent that institution before CATIE's Regional Committee and serve as the contact person for communication between the institution and CATIE."

The obligations of CATIE include:

"(a) Designate,at its cost, the resident researchers to provide continuous technical assistance to the national coordinator, and to integrate their research activities in small farm production systems into the established practices of the national institution."

"(b) Support, with its specialized core staff and facilities in Turrialba, production systems research activities."

"(c) Jointly program with the national coordinator the program's annual activities and evaluate progress."

"(d) Promote and provide support to the training of technical personnel in research and technology transfer."

"(e) Jointly prepare the reports required during the program."

"(f) Formulate procedures, methodologies, and techniques for research, and application in the field of the results which show favorable possibilities."

Within these overall guidelines, CATIE and the national cooperating institutions will carry out the following specific activities over the four and one-half year period.

1. Methodologies for Farm Level Research

This output builds upon the previous work done by CATIE under project 596-0064. That work concentrated largely on multiple crop farming. Using the experience gained to date, CATIE will signif-icantly expand its research efforts to incorporate a wider farming systems approach, i.e. a complex interdependent association of plants, animals, soils, labor, tools, and other inputs, all in-fluenced by the ecological and socio-economic environment, and predominantly dependent upon the farmers knowledge, ambitions, and abilities. Change in one of these factors or practices will normally require a reappraisal of others. Unlike the temperate regions, the interactions of these factors in the tropics are not well understood. Work in this area has almost exclusively been in the export-oriented plantation crops. Consequently, the known methodologies for a comprehensive farm system are not designed to relate to traditional small farmer multiple-cropping systems. Thus, effective techno-logical alternatives must be designed within the conceptual frame-work of a small farm, tested on-site and under the farmer's manage-ment, and evaluated in terms of appropriateness to the farmer's existing system, ease of understanding and adoption, and increased income and employment generation.

Most small farmer research in the area has focused on single major crops (largely grains) and on the improvement of livestock production oriented largely to larger farmers, with little inte-gration of these two farm components. CATIE, under project 596-0064, has in most C.A. countries set the stage for a sig-nificant shift in interdisciplinary and multiple crop research at the small farm level.

Farming systems methodology is a procedure for constructing area-specific farming systems recommendations. Project 596-0064 has developed and is transfering to national agencies a methodology for cropping systems research and preparation of cropping-systems recommendations. The proposed project expands this methodology to include a complete farming systems research approach, i.e. take into account the physical environment, the socio-economic conditions, and the design of appropriate alternative sub-systems (including crops, animals, and mixed-farming). This includes, beyond on-farm research, and to the extent possible, analyzing similar small farm systems and methodologies developed in the United States, Europe and Asia. The best methodology for studying complete farming systems will be a project output and can only be described in general terms at this time. Accordingly, the following discussion describes the theoretical framework and approach to be followed.

The different Central American farming sub-systems and how they can be integrated into improved systems are not yet known to C.A. researchers, however, it will begin with selecting and studying small farming systems predominant in selected C.A. regions to obtain information on their major variables, including: a) distribution of crops and animals; b) allocation of inputs to each sub-system; c) changes in distribution of components such as soil moisture, land topography, elevation, and farm size, and d) changes in allocation of inputs to each sub-system such as soil fertility, marketing facilities, and socio-economic constraints.

The resulting methodology, in which IICA/PIADIC assistance will play a role, will give researchers of cooperating institutions a set of guidelines which, adapted to the local situation, will allow them to design improved farming systems and to prepare location-specific recommendations for farming systems.

This output will be measured in terms of documents dealing with aspects of ecology, socio-economics, crops, animals and factors of farm production (see Annex VII.B on farmer recommendation methodology). At least one document, up-dated periodically, will be produced for each target area selected.

By the end of the project at least 10 crop, 6 animal and 6 mixed farming systems for small farms will have been developed and tested through the coordinated efforts of national research institutions and CATIE. Farmer recommendations for these systems will be target area specific and will present one or more crop-animal options which will improve management practices in terms of yield or net farm income in comparison with traditional systems. The information will be for given environmental conditions and will include the information needed to integrate the improved system into the existing farming system, indicating the predicted benefits and costs of each alternative. Small farmers will be the ultimate users of this

information but research and transfer organizations at the national level will be the compilers, conveyors, and intermediate users.

Recommendations also will address rural family nutrition as well as the conservation of natural resources (soil and water) by selecting combinations of annual and perennial crops, pastures, and animals in the form of an integrated system whose mutually reinforcing elements contribute a more balanced and nutritional diet and soil conservation and improved moisture utilization.

Recommendations will be prepared as a national publication with the technical assistance of CATIE project staff. It will be written by the concerned national program staff (of which the CATIE country representative will be a member). The degree of CATIE participation will vary from country to country depending upon the research and information packaging capability of each national institution.

Documents will include, for a given target area, a data summary and technological recommendations. Outreach documents will be drawn from the technological recommendations as needed. Normally such extension documents, rather than the complete technical document, are passed through the extension services to the ultimate end user (small farmer) along with corollary advice and assistance.

Annex VII.B provides an outline of the specific contents of a typical farmer recommendation document (a so-called tech pack).

This work, while complementary and related, differs significantly from the mono-culture work done by PIADIC under project 596-0048 which is outlined in Annex VII.A. In many respects, CATIE's multiple cropping research will be an end user of PIADIC-assisted methodological and data gathering work in each country.

2. Research Extrapolation Methodologies

At present, agronomic research results are usually considered limited in applicability to a single ecological (e.g. site specific) area. Thus research must be duplicated for other sites, increasing the overall cost of yield improvement of agronomic production and greatly extending the time frame for affecting small farmers in the region. This, in spite of the fact that within Central America, large areas of land are planted in similar basic food crops (often the same variety) and many similar fruit and vegetable species are found in selected areas of each country. Some of these are indigenous plants (corn, cacao, beans, allspice, vanilla, avocados, etc.) while numerous varieties have been imported from other areas of similar ecological situations in North America, Europe, Africa and Asia. Thus, it is reasonable to expect that such similarities will allow for considerable swapping of research results from one area to another.

Cropping systems research carried out by CATIE under project 596-0064 will produce various recommendations for the areas in which they were produced. Unfortunately, they cannot be recommended at this time for use in other areas. The project aims at producing an extrapolation methodology offering an acceptable level of production response if agricultural technology (e.g. varieties, crop series, cultural practices), or a combination of these (e.g. multiple cropping systems), is transferred from one geographic area to a similar area.

At present, such a methodology is not available for either single discipline or multiple cropping in Central America nor is the soil and climatic data available in a form to make preliminary approximations. Accordingly, at this time, it is possible to describe only in general terms the theoretical framework and approach which will be followed. (Annex VII.B provides a more detailed description and analysis of the methodologies involved.)

The extrapolation methodology procedure begins with two basic assumptions.

a) That there exists a quantifiable relationship between a given environment and any farming system (the environment/system relationship).

b) That there exists a quantifiable relationship between any two geographic locations (the locations relationship).

Possible methodologies developed under this project will involve variations in determining one or the other, or both of the above relationships. They will also measure the potential to predict yield responses when moving a system or technology from one area to another.

Under this first approach, initial environmental/system relationships will be determined from information included in site specific area profiles, developed in coordination with PIADIC-assisted national technicians and based upon PIADIC-assisted data bases. These will be confirmed through detailed recording of major environmental characteristics at both the original and new locations (e.g. analogous areas) and yield response as well as plant growth comparison will be made under field conditions. Locations relationships will result from the identification and testing of systems in areas of apparently similar ecologies in the same or different test countries. Nicaragua, Honduras and El Salvador have been selected as the test countries for methodology development because of the quantity and quality of their baseline data.

As noted, this project will draw upon the benchmark soil and climatic data being assembled with PIADIC assistance, and will

further refine this data to the specific requirements necessary to develop and field test several approaches for a) the definition of replicable production areas (e.g. RPAs or analogs) in the test countries of Nicaragua, Honduras and El Salvador, and b) the prediction of expected production response of cropping systems and selected individual crops and varieties of major small farm crops.

Using PIADIC-assisted data bases, climatic data in the test countries will be assembled for critical production determinants (mean weekly and monthly minimum and maximum temperatures, radiation, humidity, wind, etc.). Similarly essential soils data (soil depth, texture and family classification, slope, water holding capacity, base exchange capacity, etc.) will be assembled from which potentially similar RPAs can be identified. National technicians trained by PIADIC will be an essential element in this work. Field trials then will be undertaken in those areas where conditions appear to exist, based on this primary data, to confirm the validity of the RPAs and determine the key data required in order to develop the best locations methodology.

A second approach to establish relationships will be to measure and quantify the most important separate environment/system relationship elements with such precision (i.e. such as a computer based system as CRIES) that already available data for a large range of crops developed over the past thirty years in the U.S. and Europe can be changed to accommodate differences in environment. This approach is much more demanding.

Both of the above approaches constitute research hypothesis to be tested. The methodology or methodologies to be developed by the project may incorporate elements of each or discover other useful methods.

3. Recommendation Transfer Research

CATIE, under project 596-0064, will produce ten multi-crop site-specific farmer recommendation documents. The proposed new project will produce at least twenty-two additional documents based on the whole farm enterprise. Transfer of these new recommendations will require a "systems" or "whole farm enterprise" approach for which the farmer will need help in examining alternatives. This will be in sharp contrast to the "single crop" package with which change agents in the region are now familiar. In addition, the Tripartite Study strongly criticized the lack of interaction between researchers and transfer agents, who are often physically separated and separately funded and administered. The result is that each has limited appreciation of the other's task. Each tends to define their problems and solutions in terms of their own responsibilities. In other words, researchers are not always concerned with diffusion, and

transfer agents are not always eager to transfer innovative and not well understood approaches. Finally, traditional transfer methods are costly and involve human and financial inputs which either exceed available resources or involve excessive time to reach all small farmers. More cost effective and wider application techniques must be found. The Tripartite Study thus strongly recommended extensive research into new methods of diffusion and adoption of agricultural technology to small farmers.

The proposed project will thus include a research element into non-traditional transfer techniques which will involve the researcher and transfer agent in a joint enterprise to determine how best to accomplish two main tasks:

- How can new information be "packaged" to reach the largest number of farmers at the least cost in the least time?

- How can results of adoption be fed back to agricultural researchers in the least time and on a continuous basis?

One example is the Basic Village Education (BVE) project in Guatemala. BVE uses a rudimentary whole farm enterprise approach to programming, as well as systems for message development, packaging and delivery, and feedback. Other innovative programs are in various stages of development in several countries within the region to provide the basic ingredients needed to link innovative research recommendations into low-cost delivery systems. Annex VII.B describes the steps in which one such program would work. In at least three of the participating countries (Costa Rica, Nicaragua and Honduras) no less than six "outreach tests" will assess the widespread viability of small farmer research recommendations and develop, demonstrate and evaluate cost-effective and efficient transfer methods.

Each test will involve either a recommendation developed and tested for the specific ecological system of the area or the extrapolation of a recommendation into an untested area. The early outreach tests will be with relatively simple cropping systems tested in the area and will use the recommendations developed under project 596-0064. For the later tests more complex recommendations for crop, livestock, and mixed-farming enterprises will be used as these become available. Each outreach test will be continued for a minimum of two years -- one year of intensive programming followed by a year of reinforcement.

Furthermore, comparative outreach tests will be conducted with the same set of recommendations simultaneously in two locations within the same country: a location in which it has been specifically tested, and an untested location where extrapolation methodology can be employed.

The outreach testing segment of the project does not envision the creation of any new institutions to reach farmers. Rather, the project will develop collaborative and coordinated actions with existing agencies to achieve its objectives. The role of the project will be to plan, advise, motivate, assist, and evaluate alternate approaches to the transfer of these recommendations to small farmers and measure their comparative effectiveness. Only transfer methods and techniques which are appropriate for use in a large scale program will be utilized. The general approach to this process in each country will involve: a) site selection; b) agency selection; c) planning and organizing; d) training and staff development; testing alternate delivery systems and e) evaluation and feedback on these systems.

a. Site Selection

Outreach tests will be established in areas for which either field-tested area-specific recommendations or extrapolation methodology are available. General guidelines for the selection of specific sites within the area will include: (i) at least 200-350 small farmers for whom the recommendations are considered to be appropriate; (ii) reasonably adequate availability of those goods, services, markets, and infrastructure which the farmers will need in order to adopt the recommendations successfully; (iii) interest of the participating country in supporting outreach experimentation; (iv) interest of those information transfer agencies presently working in the test area with the capability to collaborate in this research; and (v) interest of the local people in the proposed activity.

b. Collaborating Information Transfer Agencies

The composition of the agencies and people is expected to vary from location to location depending upon what agencies are functioning in a given area. Such variation is desirable because it will permit comparisons among different types of information transfer approaches. In general, however, a test may involve the coordinated action of a group of agencies such as the official extension agency, the principal research agency, the local farmers' cooperative, the agricultural credit bank, fertilizer and insecticide distributors, the national marketing agency and mass media (newspaper or radio) agencies.

c. Planning and Organization

A permanent steering committee of country representatives will be established in each country to plan, organize and coordinate all activities associated with the outreach testing.

The steering committee will develop a jointly approved plan of action for field implementation, serve as a clearinghouse for

exchange of information and ideas, and be the mechanism for liaison, coordination, review and mid-course modification.

A CATIE agricultural information specialist will spend approximately half time working with project and collaborating technicians in organizing recommendations into formats and presentations that can be easily interpreted and properly used by the information transfer agents. The other half time will be directed toward assisting participating agencies in planning, implementing and evaluating outreach tests.

Each of the participating countries will be required to provide an outreach test coordinator. That technician will be assigned to work with the CATIE project coordinator for the country, but will work exclusively on information transfer activities within the transfer research target area.

d. Training and Staff Development

Continuous staff training and development will consist of initial short, intensive training courses followed by frequent, regularly scheduled reinforcement training for those methods to be used in the transfer test in that area. Course content will include technical training on the recommendations, and communicator and skills training on the information transfer and feedback systems to be used and tested. Specialized content, such as interviewing procedures or data collection will be provided as needed for recommendation and transfer alternative evaluation. Of particular value will be the area sample frame being developed under the PIADIC project for both preliminary target group assessments and feedback from small farmers.

e. Evaluation and Feedback

Reliable feedback is critical to maintaining communications between researchers and the farmers who are applying their recommended research results. Evaluation and feedback between farmers and researchers are seen in two stages. The first is the period of initial on-farm research during which the process is virtually continuous: Transfer researchers are directly monitoring research on-site, establishing the relationships between tested alternatives, and recording results for later recommendations. During this stage feedback from the farm to the researcher is constant and direct. The other stage is that of mass promulgation of the recommendations through transfer agents trained for the task. In this stage mechanisms must be established to insure feedback on a broad scale to the researchers.

4. Training

The project will provide training and staff development

opportunities for Central American research and outreach technical personnel through direct exchange of information and field work with project personnel as well as through workshops, seminars, short courses, and graduate training. (See Annex VII.B for a further discussion on the proposed approach.)

In-service training at the national level will include direct instruction and field work of national counterpart technicians working with project personnel, and workshops on recommendation development, extrapolation methodology, and information transfer. It will also include the provision of bibliographies, progress reports, and reprints of relevant farming systems research and information transfer methods developed world wide to national counterpart teams.

A minimum of eight short courses and workshops will be developed and presented on key topics concerning cropping systems. At least four sessions will be presented on animal systems. A minimum total of 148 technicians will be trained through the seminars and workshops. Eight additional short courses/workshops will be given on research information transfer and utilization relating to farming systems. Over the life of the project, some 200 additional public and/or private extension and outreach personnel will be trained.

Graduate level training at the Masters level will be made available for a minimum of 11 Central American Ingenieros Agrónomos, Masters of Science, Masters of Agriculture, of Ph.D. candidates. This training will be undertaken at CATIE, under the CATIE/University of Costa Rica agreement, when full Masters degree training is required. For Central American graduate students studying in U.S. or other graduate programs who wish to complete a thesis project in their own country under the CATIE research program on some aspects of farming systems, the project will provide living allowances and cover field research costs for up to 18 months. Thesis research will be integrated into and be a part of the farming systems research programs of the national research institutions. All Masters and Ph.D. level students will agree to work for national counterpart institutions upon completion of their scholarships for a minimum period of two years for each year of scholarship support. National institutions will agree to employ students on completion of their studies and to assign them to work on farming systems or related research or information transfer activities.

Short courses training activities will utilize the technical personnel and physical facilities both of the national institutions and of CATIE. A limited number of outside short-term consultants may assist in instruction and training in disciplines not represented on CATIE or national staffs.

In addition to formal training activities, national institution and staff development will take place "in service" through the continuous contact of CATIE researchers and information transfer personnel in their cooperative work with counterpart national institutions.

INPUTS

The proposed project will total $20.5 Million; $7.4 million from AID; $2.9 million from CATIE, $2.4 million from Other Donors and $7.8 million by the National Institutions.

1. AID: AID funding will provide approximately 135 person years of long-term professional level (i.e. MS and Ph. D.) technical assistance, 4.5 person years of short-term professional level technical assistance,96.5 person years of support personnel services, 17 4-wheel drive vehicles and six 2-wheel drive vehicles, animal demonstration facilities, office equipment, travel to include 528 intraregional person-trips, international travel and 2000 person-days of in-country travel, laboratory and other research material, training to include 20 short-term regional workshops and 11 scholarships for long-term training (Masters level), equipment operation and maintenance,general administrative support and supplies. Annex X.B.1 provides a detailed listing of inputs.

2. CATIE: CATIE inputs will include 36 person years of professional staff services and 33 person years of other personnel services, transportation and drivers, administrative support personnel (secretaries, travel, accounting), administrative and communications facilities, office facilities and equipment, research land, soil, pathological, entomological and animal laboratory facilities and equipment, library facilities and research reference support, equipment maintenance and operation, animal feeds, and general managerial support. Annex X.B.3 provides a detailed listing of inputs.

3. Participating Countries: The six countries will contribute an estimated 222 person years of personnel services including professional staff time, research facilities and related support (chemicals, livestock, computation facilities, etc.). Annex X.B.5 provides a detailed listing of inputs.

4. Other Donors: Four other principal donors will contribute a total of 35.5 person years of professional staff services, 16 person years of other short-term personnel services and related support (See Annex X.B.4).

5. Participating Farmers. Small farmers will contribute land for research, labor, and field management. This input is not quantified.

III. PROJECT ANALYSIS SUMMARIES

This section will summarize the analyses of both proposed projects within the overall research and information strategy proposed herein. For project 596-0048 (i.e., PIADIC), analysis will concentrate on those issues raised in STATE 219445 (Annex IV.A) which remain relevant in light of the subsequent re-design of that project. For the proposed project with CATIE (596-0083), this analysis will reflect the issues raised in STATE 267752 (Annex IV.B) as well as those raised in development of the regional agricultural research strategy in STATE 219445 above.

In this regard, ROCAP has deferred addressing the question of appropriate technology raised in STATE 219445 pending the completion of a regional technology strategy to be completed in February, 1979. Accordingly, the conduct of separate appropriate technology surveys per se by PIADIC has been eliminated from this proposal and analysis of that issue (#3) deferred to the proposed strategy document.

A. Economic Feasibility Summary

Review of some thirty cost/benefit analyses of national agricultural research[1/] show that rates of return of 50 to over 100 percent are not uncommon (only four studies reported return rates of 20 percent or less). International research studies show, for example, that one dollar invested in CIMMYT wheat research generated an income stream of over $300 dollars. Similar investment in IRRI rice research generated over $140 dollars. All of the above studies, however, have been ex post analysis. Ex ante estimation is much more difficult, as it depends upon assumptions regarding the magnitude and duration of the future benefit stream. That being the case, the analysis herein accordingly specifies certain expected outputs; however, it cannot realistically specify the extent to which these outputs will be utilized over time by beneficiaries.

An economic assessment of the effects of proposed agricultural research is contained in Annex V and is summarized here. The analysis deals with two aspects of the impact of multi-disciplinary agricultural research -- micro and macro -- on small farmer welfare.

1. Farm Level Impact. One part of the analysis focuses on the small farmer impact of introducing a production alternative of multiple cropping (corn and beans) on a small farm in Samulaif, Matagalpa, Nicaragua. CATIE, under project 596-0064, carried out a series of on-small farm research tests with a team of agricultural and social scientists. The recommendations and results of one have been compiled into a document for use by other researchers and extension agents.

1/ Arndt,T., et al. Resource Allocation and Productivity in National and International Agricultural Research, University of Minnesota Press, Minneapolis, 1977.

The results of the introduction of the production alternatives demonstrated that the adjustments required of the small farmer to adopt the proposed recommendations are few in number, simple to execute, site specific and of proven compatibility with traditional cultivation practices. To the extent corn inter-planted with beans is the only combination possible given the technology and resources at a small farmer's disposition, the conclusions of the economic analysis are as follows:

(1) Benefits far exceed costs of adopting the proposed cultivation practices.

(2) Adoption of the proposed cultivation practices requires only a 3 percent increase in labor requirements.

(3) Total family income increased 98 percent with adoption of the improved cultural practices.

(4) Returns to investment (total income/total cost) increased over 60 percent.

(5) Returns to labor input increased over 70 percent.

2. Macro Considerations. Cost benefit analysis of such a region-wide research and information effort is difficult at best; however, an attempt was made to determine the economic feasibility of the CATIE portion of the program. Estimating a cost of approximately $12 million (excluding national contributions), the cost-benefit analysis in Annex V indicates a cost-benefit ratio, over a ten-year period using a 12 percent interest rate, of 1:1.2.

3. Other Considerations. Program impact will likely be felt in any or all of the following: (a) reduced consumer food prices, (b) increased national income and employment, (c) reduced foreign exchange outlays for imported foodstuffs, (d) enhanced resource efficiency, and (e) modified income distribution. In addition, we expect higher yields and more efficient use of resources will conserve scarce national resources. Training will directly benefit national technicians and small farmers, the latter hopefully significantly improving their nutritional status, state of health, and general productivity. Finally, the incorporation of refined concepts of integrated pest management will reduce individual and social costs of agro-chemical induced illness and death.

In light of all of the above, ROCAP concludes that the proposed research effort is economically feasible and worthwhile.

B. Social Soundness Analysis Summary

The magnitude and degree of poverty and poor nutrition are inversely related to farm size. In general, the smallest operators and their families in Central America are the poorest and least nourished. The regional average annual per capita income ranges from $49 for farms of four hectares or less to $952 for farms of more than 35 hectares. The former group constitutes more than 76 percent of the region's 10.2 million farm population. Within this group, there are large numbers of farms less than four hectares and consequently earning less than $49 annually. Additionally, nearly 28 percent of the region's rural population are landless, while 76 percent of the farms occupy only 6 percent of all farm lands. Open unemployment, seasonal unemployment reaching 50 percent or more, and widespread underemployment are common factors. Finally, per hectare yields of the region's major food crops are consistently lowest on the smallest farms.

Annex VI contains a case study of a 52-year old small farmer in Costa Rica, Don Victor, who has been studied by CATIE as a typical traditional farmer in the region. The case study presents Don Victor's family and its resources, the cropping systems employed, livestock and forestry resources, and their farm environment relationships. Don Victor's farm represents a model of where CATIE will carry out its farming systems research.

Annex VI also discusses the proposed research and transfer relationships to small farmers in terms of their resource productivity, nutrition, employment, risk reduction, conservation, socioeconomic factors, and the diffusion of innovation. The research will be structured within these relationships. For example, research will be small family owned farm specific (0.1 to 7 hectares in crops, up to 10 hectares for animals), with special consideration given to agrarian reform areas (where low income farmers may be holding up to 20 hectares). A key element of the CATIE research is to explore how best to improve small farmer productivity from limited land and labor resources, either from increased yields or new combinations of income producing or more nutritious crops. For example, research shows that cow peas yield more than common beans in humid lowland tropics, are acceptable, and fit well into the known cropping systems. In addition, farming systems research aims at recommendations that adjust a farmer's time to his need to seek seasonal off-farm employment, and increases the productivity of on-farm time to help reduce the need to seek such employment. To encourage his participation, crop research will aim at recommendations that minimize risk through the selection of crop and animal components and management systems that complement current crops, land use, available capital and labor, and are tolerant of wider ranges of weather, insects and diseases. Finally, the research into transfer methods will address how each farmer relates to various sources of information and to what degree his adoption of new technology is influenced by the attitudes, ethnicity, social class, etc. of the agents involved. As examplified by the study of Don Victor,

research will start with asking why, how, when and where questions on current production systems, how they work, and within what socio-economic environment. The recommendations will march to this drumbeat.

From the foregoing, we conclude that the ultimate beneficiaries of the proposed activities will be the small farmers of Central America and Panama. Project research will be carried out mostly in small farmer areas, in crops suitable to small farmer cultivation, and on small farm plots emphasizing small farmer collaboration and participation. The economic analysis conservatively projects that 20,000 farmers will adopt the new practices over an eight-year period; however, the specific activities to be accomplished by CATIE and cooperating national institutions will directly impact on approximately 5,000 small farm plots in the region over a four-year period. Directed and unassisted diffusion to other farmers is expected to be widespread.

The work of PIADIC in this effort will be highly complementary. PIADIC will be working closely with national information and transfer agencies in strengthening their capacities to collect, store, retrieve, analyze and transmit the basic elements of agricultural research and planning in each country. The area sample frame will be collecting small farm data, area profiles will be identifying the parameters of applicable production areas, small farmer recommendations will be assembling known research data for inclusion in CATIE's on-site research efforts, and key data bases will enable researchers to access available information on a wide scale. The result should be more relevant research, at lower cost, available on a wide basis to people who are making decisions affecting small farmer welfare.

CATIE research into farming systems will also have a major impact on the role of women on the farm. As described in Don Victor's case, farm family labor is a critical element (50 percent) in a farm's resources. Women play an important role in the farm activities, especially in the care of small animals. CATIE's research activities are specifically designed to now consider all aspects of the farm system and major recognition of the role of farm women is expected to result in recommendations on how to best utilize this now neglected resource. In addition, IICA has recently signed an AID/W funded project on the role of women in development. CATIE/IICA cooperation under this AID/W project, the proposed research project, and the proposed PIADIC extension are all expected to significantly enhance each project's impact on rural women.

While project benefits by their nature are aimed ultimately at the target group, there are short-term benefits to CATIE, IICA and national research, information and transfer agencies.

The PIADIC program will have trained 200 national technicians in design and use of the area sample frame, an additional 200 national technicians in methodologies of research design and related data management, and 200 other national technicians in the methodologies and procedures to establish national information centers.

C. Technical Feasibility Summary

The methodologies developed by PIADIC and CATIE under this program, with the exception of research extrapolation and recommendation transfer, conform largely to known approaches which are being introduced into the region with specialized technical assistance and general support. The technical feasibility analysis discusses the suitability of the programs design in various aspects.

ROCAP has on file copies of letters of support from the six Central American and Panama Ministers of Agriculture for the extension of PIADIC and the continuation of CATIE-assisted research in their respective countries, indicating a compatibility of the proposed programs with national agency priorities.

Annex VII.B provides a review of how PIADIC-assisted activities fit within the so-called "Iowa Model" stages of agricultural research and information systems development. PIADIC-assisted activities are concentrated mostly within the first four stages (scientific production of knowledge, knowledge management, knowledge translation, and product development) with limited work in stage five (production dissemination) and no work in stage six (product adoption and utilization). PIADIC staff has recently been significantly strengthened and reorganized. They have the capacity to carry out the program proposed, and the heavy emphasis on training of national staffs insures a significant improvement in national capacity to assist in developing and absorbing the new techniques.

PIADIC activities during the period of the extension have been re-designed to more closely complement CATIE and national research efforts. IICA staff dedicated to collection and use of data has been strengthened, including the addition of a rural anthropologist and rural sociologist. PIADIC and CATIE staff have agreed to work closely with national technicians on gathering baseline data for replicable area research and farmer recommendation methodology, and PIADIC training programs will be highly complementary to CATIE and national research agency needs. Concurrently, the program has de-emphasized non-research related activities such as crop forecasting, market news and technology surveys per se.

With regard to cropping systems research, the proposed CATIE activity builds upon a methodology, developed under project 596-0064, which entails five inter-related processes: diagnosis, design of technological alternatives, field testing, evaluation, and preparation of resultant proved small farmer recommendations. The results of this approach appear to be technically and operationally adaptable to mixed farming, annual systems, and monoculture research, and are suited to small farm needs in Central America. Annex VII.B discusses these aspects, the feasibility of incorporating small animal systems research within on-going efforts, and how these on-going efforts will be expanded to develop a methodology for extrapolating this research to replicable production areas throughout the region.

The technical capacity of CATIE and the national institutions to conduct small farm research and develop relevant methodologies has been proven under project 596-0064. The proposed program provides long and short term technical assistance, training, and operational support for CATIE to carry out the project.

Finally, AID/W has suggested that horticulture crops, as a separate research discipline, be included within the CATIE research proposal. Clearly, there are major opportunities for small farm tropical horticulture within an integrated small farm systems approach, and indeed the on-going CATIE research, as well as this project, includes some work in this field. However, CATIE and the Central American countries have had comparatively little experience with tropical horticulture crops, and the inclusion of this element as a major activity at this time, in the opinion of ROCAP and CATIE, would significantly complicate an already complex project design. ROCAP intends, however, to keep this matter under continuous review.

D. Relationship to Title XII

From its inception, ROCAP and CATIE have believed that, although no known U.S. university or the USDA was working in the specific areas covered by this project, both CATIE and a U.S. institution could mutually benefit from a Title XII relationship. ROCAP received AID/W telegram, "Potential FY 1979 Title XII Projects" (STATE 234979) of September 31, 1978 from the L.A.C. Bureau indicating this project as being among those which would be proposed to the BIFAD from Latin America with which Title XII institutions may wish to pursue the development of a design and technical collaboration linkage. ROCAP noted in its response on October 5, 1978 that the Small Farm Production Systems project would use U.S. university expertise in its design but left open the question as to whether one U.S. institution had the expertise required to implement this project. GUATEMALA 6242 of October 5, 1977 indicated to the Title XII board our interest in developing

an operational collaboration through the CRSP in this regard. Although we know that this proposal was circulated to several U.S. universities, no positive reply was later received.

In February 1978 the ROCAP Director and RDO visited Dr. Woods Thomas of the Title XII office in AID/W to further discuss their interest in collaborating on this project and ability to field a team within an appropriate timeframe to assist in its design. ROCAP was advised that a team could be organized for this purpose. However, the proposed timeframe exceeded by several months the Mission's schedule for preparation of the project paper. It was mutually considered infeasible, therefore, as a source of expertise for the project design phase of the project by both Dr. Thomas and ROCAP.

ROCAP did call upon a senior group of advisors from Title XII institutions to assist in the preparation of this project. Dr. Phillip Warnken of the University of Missouri coordinated the preparation of the working documents required for the project paper and the activities of the consultant team. Dr. Foster Cady, of Cornell University, worked with the CATIE staff on the statistical implications of analogs and farm level research. Dr. Joe Conrad, of the University of Florida, assisted in the development of the potential use of swine in the small animal production systems research. Dr. Len Austin, Marketing Advisor from the University of Colorado, assisted in his area of specialization in development of the marketing implications of farming systems for small producers.

Dr. Neil Fine, of the USDA, assessed research institutions in Central America and Dr. Morris Shelton, also of the USDA, provided inputs on the potential role of sheep and goats in animal systems research for small farms.

The process of filling the U.S. short term specialist requirements of the project will envolve the BIFAD/JCAD in soliciting technical proposals from U.S. universities or consortiums of universities. The resulting proposals will be screened by the AID and BIFAD staffs and forwarded with their recommendations to CATIE for final selection. Contract(s) for their services will be made by CATIE. The long term U.S. project leader will be employed after solicitation, from either a U.S. university or the USDA and contracted by ROCAP. In addition to his technical qualifications this technician must have a broad understanding of BIFAD's method of operations and close formal or informal linkage to the U.S. university community.

E. Administrative Analysis Summary

The administrative analysis of CATIE is presented in Annex VIII. CATIE's organization is discussed, its history, recent restructuring to provide greater flexibility in its inter-disciplinary research approach, its major research activities since 1944,

the formal and informal relationships it enjoys with national agencies, international research centers, and other donors, the lands, facilities, and equipment it owns in Costa Rica, and the professional staff it currently employs. In addition, it contains a listing of the job descriptions of the senior and junior professional staff to be employed under the program.

With regard to IICA, their administration under project 596-0048 has been very satisfactory. IICA has proven capable of locating and acquiring the skilled personnel needed for the project staff and, through them, of carrying out its responsibilities to the project. IICA has successfully coordinated the activities of the multiple national and regional agencies and committees directly participating in the project.

IICA has recently modified these arrangements to institutionalize the activity within its regular organizational structure. Up to now the project has been treated as a special activity and has not been funded through any of IICA's seven principal budget activities (i.e., its permanent programs). As of July 1978 IICA placed the project into CIDIA, its permanent arm for agricultural documentation and communication activities, and the first of the seven regularly budgeted lines of work. At the same time CIDIA's responsibilities were broadened beyond its present main role of maintaining a document center to embrace a statistics and current data system as well as IICA's electronic data processing unit. This will better equip IICA to properly play a role as one of the region's major agricultural information centers capable of participating in and coordinating the diverse activities stimulated and addressed by the project. A senior IICA administrator has taken charge of CIDIA's operations and the project has become, in effect, CIDIA's permanent program for Central America. IICA's North Zone office (which covers Central America) will coordinate CIDIA's implementation of the program throughout the six countries. IICA's present project director is a qualified professional who will report to the new CIDIA director. This restructuring will give the project a permanent organizational home in IICA, including regular budget support which will ensure its continuation beyond 1981 when A.I.D. funding support will terminate. It will also allow IICA to consider extending the activity into its other geographical areas of responsibility (South America and the Caribbean).

F. Environmental Concerns

The AA/LAC has signed a negative determination on the environmental impact of PIADIC activities under project 596-0048.

Attached as Annex IX is an initial environmental examination for CATIE activities under project 596-0083 recommending a negative determination.

IV. FINANCIAL ANALYSIS AND PLAN

A. Project Funding - IICA/PIADIC (Project 596-0048)

1. Background. Initial A.I.D. funding for this project was provided in late FY 1975. Funds obligated to date total $1,929,000, including $226,000 of interim FY 1978 funding provided in August, 1978 which extended project funding to March 1979.

2. Summary Financial Plan. The Financial Plan, Summary Cost Estimate, and Projected Expenditure tables are shown below. Estimated costs are shown for fiscal years 1979, 1980, and 1981. As reflected on the facesheet, initial funding is programmed for FY 1979 obligation. Final funding is scheduled for 1981. The total estimated cost of the project for the period April 1979 through June 1981 is $2,445,000. Of this, $1,468,000 (60%) will be provided by A.I.D. and the remaining $977,000 (40%) by IICA (additionally, an estimated $200,000 will be provided by national and regional participants). A.I.D. financing will be in the form of a grant to be disbursed through agreements with IICA. $906,000 of the A.I.D. contribution will finance some 302 person-months of U.S. and local technical assistance. One project support vehicle and one photocopyer will be procurred at a total cost of $15,000. Other costs of $547,000 are mainly for operational support items including travel, training, and operating supplies.

Of IICA's $977,000 contribution, $635,000 will be applied to personnel costs for 181 person-months comprised principally of short and long-term technical assistance (non-U.S.). The remaining $342,000 in counterpart funds will cover the costs of facilities maintenance, office space, secretarial services, and administration of six national offices, one regional office, and the headquarters facility in Costs Rica providing office, meeting, and training facilities for the project. IICA's contribution represents a substantial increase in the portion of project costs it will be bearing. As significant as the absolute level of support is the fact that IICA's support will now be included in its regular budget (rather than carried as a special project as in the past), thus further institutionalizing the effort. The $200,000 contribution from participating regional and national agencies reflects only those costs of personnel devoted expressly to the project. It does not include the contribution in human and material resources represented by the national agencies participating in project activities. While the value of those contributions to the project is not easily assessed, it clearly exceeds the cited figure by a substantial margin. At Annex X.A. are detailed expenditure schedules with explanatory commentary on individual line items. Annex X.A.1 presents an analysis of IICA's financial statements and a five-year revenue trend analysis of that institution. In summary, IICA's revenues show a pattern of constant growth reflecting steady increases in member countries' contributions and growing demand for IICA's services.

Table I

IICA/PIADIC - Project 596-0048

PROJECT FINANCIAL PLAN
(U.S. $000)

Project Assisted Activities	1979		1980		1981		All Years	
	AID	IICA	AID	IICA	AID	IICA	AID	IICA
Rural Sector Statistics -- Area Frame Development Assistance	90	25	117	50	36	37	243	112
Data Bases Development & Use Assistance	251	104	371	208	81	157	703	469
Information Centers & Interchange System Development Assistance	84	51	180	106	55	85	319	242
IICA and Regional Organizational Capability to provide Technical Assistance and Coordination for C.A. National and Regional Information Systems	75	34	90	69	38	51	203	154
	500	214	758	433	210	330	1468	977

TOTAL AID & IICA 2445

Table II

IICA/PIADIC - Project 596-0048

FINANCIAL PLAN SUMMARY
(U.S. $000)

Project Assisted Activities	1979	1980	1981	Total	% Project Total
1. Rural Sector Statistics -- Area Frame Development Assistance 1/	115	167	73	355	14.6
2. Data Bases Development & Use Assistance	355	579	238	1172	47.9
3. Information Centers & Interchange System Development Assistance	135	286	140	561	22.9
4. IICA and Regional Organizational Capability to provide technical assistance and coordination for C.A. National and Regional Information Systems	109	159	89	357	14.6
	714	1191	540	2445	100.0

1/ This budget is for Area Frame Development Assistance, however funds for collecting data using the sample frame are included in the Project Assisted Activity No. 2 Data Bases Development.

Table III

IICA/PIADIC - Project 596-0048

PROJECTION OF EXPENDITURES BY FISCAL YEAR

(U.S. $000)

	1979		1980		1981		All Years	
	AID	IICA	AID	IICA	AID	IICA	AID	IICA
Technical Assistance								
Long-Term U.S.	$153	--	$306	--	$126	--	$585	--
Short-Term U.S.	50	--	40	--	10	--	100	--
Long-Term Non-U.S.	77	110	125	224	19	173	221	507
Short-Term Non-U.S.	--	28	--	56	--	42	--	126
Sub-total	280	138	471	280	155	215	906	633
Commodities	15	--	--	--	--	--	15	--
Other Cost (Operational)								
Travel & Per Diem	45	--	70	--	10	--	125	--
Training meetings & technician exchange	45	--	70	--	30	--	145	--
Surveys, studies & short-term service contracts	90	8	112	17	5	13	207	38
Evaluations	5	--	5	--	5	--	15	--
Supplies & Materials & Services	20	14	30	28	5	20	55	62
Office & training facilities	--	54	--	108	--	82	--	244
Sub-total	205	76	287	153	55	115	547	344
Total	$500	$214	$758	$433	$210	$330	$1468	$977

B. Project Funding - CATIE (Project 596-0083)

Summary Financial Plan

The proposed project will total $20.5 million: $7.4 million to be provided by A.I.D., $2.9 million by CATIE and approximately $2.4 million by other donors and $7.8 million by the national institutions. The project funding period will be from April 1979 through September 1983. Tables I, II and III, Financial Plan, Projection of Expenditures and Summary Cost Estimates reflect projected costs by specific inputs, by cost elements and by foreign exchange and local currency costs, respectively. A summary of projected costs by elements and source of funding follows:

(US $000)

	Projected Costs				
	Source				
Project Element	AID	CATIE	OTHER 1/ DONORS	NATIONAL INSTITU-TIONS	TOTALS
Personnel Cost	4,801	2,106	1,672	4,375	12,954
Commodities	408	196	79	2,200	2,883
Travel & Per Diem	823	44	92	30	989
Training	328	---	504	---	832
Other	793	590	46	1,200	2,629
Totals	7,153	2,936	2,393	7,805	20,287
Contingencies	250	---	---	---	250
Total Project	7,403	2,936	2,393	7,805	20,537

1/ Overseas Development Ministry (British), Organization of American States (OAS), the International Development Research Center (IDRC), and the International Plant Protection Center (IPPC). Also included here are AID/W regional programs under DSB. Annex X.B.4 provides details. Also, Annex VIII describes the other donor activities at CATIE.

TABLE I

SMALL FARM PRODUCTION SYSTEMS PROJECT

FINANCIAL PLAN

(US $000)

System Inputs By Source	Personnel Costs	Commodities	Travel & Per Diem	Training	Other	Contingency	Totals
Cropping Systems:							
AID	2,084	143	359	144	349	110	3,189
CATIE	927	69	19	---	287	---	1,302
Other	736	28	40	222	20	---	1,046
Totals	3,747	240	418	366	656	110	5,537
Animal Systems:							
AID	1,222	135	208	82	198	63	1,908
CATIE	527	65	11	---	147	---	750
Other	418	26	23	126	12	---	605
Totals	2,167	226	242	208	357	63	3,263
Mixed Systems:							
AID	1,495	130	256	102	246	77	2,306
CATIE	652	62	14	---	156	---	884
Other	518	25	29	156	14	---	742
Totals	2,665	217	299	258	416	77	3,932
National Institutions	4,375	2,200	30	---	1,200	---	7,805
Systems Totals:							
AID	4,801	408	823	328	793	250	7,403
CATIE	2,106	196	44	---	590	---	2,936
National Institutions	4,375	2,200	30	---	1,200	---	7,805
Other	1,672	79	92	504	46	---	2,393
Project Totals	12,954	2,883	989	832	2,629	250	20,537

SMALL FARM PRODUCTION SYSTEMS PROJECT
PROJECTION OF EXPENDITURES BY SOURCE AND FISCAL YEAR

TABLE II

(US $ 000)

	1979					1980				
	A I D	CATIE	Other Donors	Nat. Instit.	TOTAL	A I D	CATIE	Other Donors	Nat. Instit.	TOTAL
Personnel Cost	413	273	269	875	1,830	1,109	526	527	875	3,037
Commodities	335	23	66	440	864	50	54	4	440	548
Travel and Per Diem	77	4	13	6	100	188	12	28	6	234
Training	28	---	63	---	91	76	---	126	---	202
Other	67	74	7	240	388	183	148	13	240	584
Sub Total	920	374	418	1,561	3,273	1,606	740	698	1,561	4,605
Contingencies	20	---	---	---	20	59	---	---	---	59
Project Total	940	374	418	1,561	3,293	1,665	740	698	1,561	4,664

	1981					1982				
	A I D	CATIE	Other Donors	Nat. Instit.	TOTAL	A I D	CATIE	Other Donors	Nat. Instit.	TOTAL
Personnel Cost	1,132	529	411	875	2,947	1,138	525	309	875	2,847
Commodities	16	50	4	440	510	7	49	4	440	500
Travel and Per Diem	192	12	26	6	236	194	11	18	6	229
Training	78	---	126	---	204	78	---	126	---	204
Other	189	148	11	240	588	189	148	10	240	587
Sub Total	1,607	739	578	1,561	4,485	1,606	733	467	1,561	4,367
Contingencies	58	---	---	---	58	59	---	---	---	59
Project Total	1,665	739	578	1,561	4,543	1,665	733	467	1,561	4,426

	1983					TOTAL				
	A I D	CATIE	Other Donors	Nat. Instit.	TOTAL	A I D	CATIE	Other Donors	Nat. Instit.	TOTAL
Personnel Costs	1,409	253	156	875	2,293	4,801	2,306	1,672	4,375	12,954
Commodities	---	20	1	440	461	408	196	79	2,200	2,883
Travel and Per Diem	172	5	7	6	190	823	44	92	30	989
Training	68	---	63	---	131	328	---	504	---	832
Other	365	72	5	240	682	783	590	44	1,200	2,679
Sub Total	2,014	350	232	1,561	3,157	7,153	2,936	2,393	7,805	20,287
Contingencies	36	---	---	---	36	250	---	---	---	250
Project Total	2,050	350	232	1,561	3,193	7,403	2,936	2,393	7,805	20,537

TABLE III

SMALL FARM PRODUCTION SYSTEMS PROJECT

SUMMARY COST ESTIMATE

(US $000)

	A I D			CATIE			OTHER DONORS			National Institutions	ALL SOURCES		
Project Elements	FX	LC	Total	FX	LC	Total	FX	LC	Total	LC	FX	LC	Total
Personnel Cost	3,649	1,152	4,801	1,465	641	2,106	1,594	78	1,672	4,375	6,708	6,246	12,954
Commodities	310	98	408	---	196	196	---	79	79	2,200	310	2,573	2,883
Travel & Per Diem	49	774	823	---	44	44	16	76	92	30	65	924	989
Training	160	168	328	---	---	---	504	---	504	---	664	168	832
Other	58	735	793	---	590	590	---	46	46	1,200	58	2,571	2,629
Total	4,226	2,927	7,153	1,465	1,471	2,936	2,114	279	2,393	7,805	7,805	12,482	20,287
Contingencies	148	102	250	---	---	---	---	---	---	---	148	102	250
Project Total	4,374	3,029	7,403	1,465	1,471	2,936	2,114	279	2,393	7,805	7,953	12,584	20,537

The Mission anticipates funding requirements during the life of the project, as follows:

(US $000)

Fiscal Year	Obligation Amount
1979	940
1980	1,665
1981	1,665
1982	1,665
1983	1,468
Total	7,403

For detailed costing of all project inputs refer to Annex X.B. of this paper. Included is a breakdown of ROCAP contributions broken down by costs incurred by CATIE at CATIE and cost incurred by CATIE in each country.

Also, contributions from CATIE and other donors are detailed for the project period. Estimated contribution from national governments has been negotiated by CATIE and the breakdown is available in Annex X.B.5. It includes professional and non-professional staff, and other support costs, and commodities.

Finally, an analysis of CATIE's assets and liabilities as of June 30, 1977 is included. (Annex X.B.6)

The question of CATIE's future financial stability and capacity to continue small farmer-oriented research will be reviewed carefully as the program evolves. ROCAP's intentions are to foster the already beginning close relationship between CATIE and the international research community. This includes the Caribbean Research and Development Institute (CARDI) which has recently earmarked $150,000 of its own funds for this purpose, an increasing interest among other donors (England, Holland and Canada) in small farm research, as well as the growing interrelationship between CATIE and the U.S. professional and university research communities. In this regard, the use of U.S. university services for technical assistance will be encouraged through the growing BIFAD and Title XII relationship. In addition, Honduras, El Salvador and Guatemala are expected to become full paying members of CATIE within two years. Each will become a member of the Board of Directors and will contribute $100,000 per year.

Finally, CATIE is not yet a member of CIGAR, the coordinating committee of major agricultural research institutions world-wide. ROCAP strongly supports CATIE's inclusion in this

selected group of agricultural research centers. It is our understanding that CATIE is under consideration for inclusion, with action possible well before the end of the proposed project. If this were to occur, CATIE would be assured of sufficient support for its activities for the foreseeable future.

Absent this possibility, a revenue trend analysis of CATIE demonstrates its ability to continue its research activities, albeit at a somewhat reduced level, with its current and projected sources of income. (see annex X.B.6).

V. IMPLEMENTATION PLAN SUMMARY

A. IICA/PIADIC (Project 596-0048)

1. Execution. Upon receipt of AID/W authorization, ROCAP will sign a project extension agreement with IICA. AID/W authorization will require Congressional Notification. Current funds are sufficient to fund the project through March 31, 1979. Accordingly, review, approval, notification, and authorization should occur prior to February 28 to allow time for negotiation and signing. After signature, IICA will contract with the necessary national local-hire staff. ROCAP will negotiate and sign a PASA agreement extension to continue U.S. technical assistance.

2. Implementation. The project builds upon three years of experience. Current operating modes which have proven effective will be continued. Annex XI.A. provides a graphic description of the major activities to be accomplished. Also, the budget commentary in Annex X.A.3 provides a position-by-position sequence of events for personnel action.

3. Waivers. This project proposes, as in the past, to finance the procurement of non-U.S. contract personnel for IICA

as well as their related support costs. Prior to March 1978, A.I.D. policy on grant financing of local procurement was unclear and, therefore, specific waivers were not deemed necessary. HB1.b now limits grant financed procurement to Geographic Code 000. Accordingly, a waiver is now required. As part of ROCAP's goal to strengthen Central American institutions, our intention (and IICA's) is to institutionalize PIADIC within IICA. This requires the recruitment, hiring, and training of qualified Central Americans and personnel from other Code 941 countries, as appropriate, and supporting their activities in the field. (IICA, as a hemisphere-wide institution, often times draws upon other Latin American countries for specialized expertise.) Specialized U.S. source assistance is available under a PASA with USDA. IICA itself is providing, as counterpart, significant technical and operational support. Procurement, by IICA, of specialized technical assistance from Code 941 countries to complement these services has been a critical element of the on-going effort. The continued ability to do so is considered to best promote the objectives of the foreign assistance proposed herein.

Accordingly, a waiver of HB.1.b, per Section 5C.4a.2e. is recommended to allow for procurement of services from Code 941 countries, including Central America.

B. CATIE (Project 596-0083)

1. Execution. Upon receipt of AID/W authorization, ROCAP will sign a life-of-project agreement with CATIE. AID/W authorization will require Congressional Notification. Current funds available to CATIE under Project 596-0064 expire March 31, 1979. Accordingly, review, approval, notification, and authorization will need to occur prior to February 28 to allow time for negotiation and signing. After signature, CATIE will begin procurement of goods and services to implement the project.

2. Implementation. Management of the project within CATIE is described in Part I of Annex X.B. Part II of this Annex provides a detailed step-by-step implementation plan. The project follows on the arrangements worked out under Project 596-0064 and, while ambitious, is considered to be workable and able to accomplish its objectives.

3. Waivers. The project proposes to continue to practice under Project 596-0064 to finance the procurement of non-U.S. contract personnel for CATIE as well as their related support costs. Prior to March 1978, A.I.D. policy on grant financing of local procurement was unclear and, therefore, specific waivers were not deemed necessary. HB.1.b. now limites grant financial

procurement to Geographic Code 000. Accordingly, a waiver is now required to continue this proven practice for the proposed project. As part of ROCAP's goal to strengthen Central American institutions, our intention (and CAITE's) is to institutionalize the small farm systems research approach within CATIE. This requires the recruitment, hiring, and training of qualified Central Americans and personnel from other Code 941 countries, as appropriate, and supporting their activities in the field. Specialized U.S. technical assistance will be made available under short-term contracts with qualified U.S. individuals to supplement this expertise. Resources available under Title XII will also be actively sought. (See Section III.D. - Relationship to Title XII). CATIE is providing, as counterpart, significant technical and operational support. Procurement, by CATIE, of specialized technical assistance from Code 941 countries to complement these services has been a critical element of Project 596-0064 and the continued ability to continue this procurement is considered to best promote the objectives of the foreign assistance provided herein.

Accordingly, a waiver of HB.1.b., per Section 5C.4a.2. is recommended to allow for procurement of services from Code 941 countries, including Central America.

C. ROCAP Administration

Both projects will be under the guidance of the ROCAP senior staff, with specific monitoring responsibility resting with the Regional RDO, assisted by the PASA team leader in Costa Rica. They will insure that the projects relate to other ROCAP and USAID supported programs in the region. The ROCAP Controller will manage disbursements. Under the CATIE proposal, ROCAP will hire a PASA research advisor, to be stationed in Costa Rica, who will monitor day-to-day developments. He will be assisted by a local-hire contract technician, to be funded under the project, to provide adequate on-site monitoring of CATIE performance in the region.

VI. EVALUATION

A. IICA/PIADIC (Project 596-0048)

This project has been evaluated twice so far and three more evaluations are anticipated.

The next evaluation is scheduled for June 1979. This evaluation will assess how well project management has been able to maintain program continuity and prepare for the duration of the project as

planned. This evaluation will be conducted by a professional expert to be contracted by ROCAP.

The following evaluation is scheduled to be conducted in June 1980. This evaluation will be carried out by a professional expert to be contracted by ROCAP. Another officer from one of the USAIDs will participate in the evaluation. Seven thousand dollars has been budgeted for this evaluation which will thoroughly review progress to date against planned outputs with a view to suggesting any appropriate actions to help ensure achievement of project purposes by the end of the project. Also, it will include an examination of IICA's project support, managerial and technical organization for project purposes, and prospects for IICA's long-term, post-project support for the program.

The final evaluation will be conducted in May-June 1981, as the project comes to completion. An evaluation team similar to that for the previous evaluation will be assembled. Eight thousand dollars has been budgeted for this evaluation which will assess total project achievements, problems encountered, and solutions effected, and will record the experience gained which may be of use in undertaking similar projects elsewhere. Beyond this, A.I.D. may find it useful in 1982/83, by way of updating the final evaluation, to take a look at the on-going program with IICA support and coordination to see how well the processes stimulated and nurtured by the project have prospered in post-project years.

B. CATIE (Project 596-0083)

1. General. Four major evaluations by external experts are scheduled over the life of the project. These are in addition to the various internal evaluation mechanisms designed into the project as part of the process of gauging the results of methodological research and development. Besides these, ROCAP expects to conduct periodic in-house reviews and evaluations.

2. ROCAP Reviews. The first formal ROCAP review is anticipated in October 1979, following the completion of project preparation and the initiation of full-scale operations. This review will examine the work to date to insure that the necessary groundwork has been properly laid and to provide any guidance needed for improved implementation. The ROCAP evaluations will be supervised by the project manager (the Regional Rural Development Officer) and will include the participation of professional experts as appropriate. Continuing in-house reviews, beyond the regular monitoring provided by monthly and quarterly activity reports, will be scheduled as indicated by project experience.

3. Major Evaluations.

(a) These four evaluations are scheduled at approximately annual intervals, the first to take place in early 1980. A total of $58,000 is budgeted for these evaluations. Project

planning envisions a three-person evaluation team to conduct each evaluation over a one-month period. ROCAP will procure the services of qualified evaluators. Likely sources of such individuals will include U.S. universities, the U.S. Department of Agriculture, and AID/Washington. Other sources might include international agricultural research organizations ans private sector firms with highly qualified individuals.

(b) Each evaluation team will include one person to concentrate on farmer recommendations, one on information transfer and utilization, and one on replicable production areas and methodologies. The team leader among these will vary over the course of the project as emphasis shifts among the various sub-activities. Specific qualifications of evaluators and their detailed plans of work will be prepared by ROCAP for each evaluation. The general plan and qualifications are indicated below:

(1) Farmer Recommendations. The evaluator for this position will analyze methodologies, progress to date, and scheduling of activities toward the achievement of planned outputs. The evaluator will visit field sites in the participating countries to inspect research activities; based on his analysis the evaluator will recommend improvements in the project's collection and use of data for crop and livestock tech-packs (climatological, production, socio-economic, and other data). This position will be filled by a senior professional researcher with experience in related activities.

(2) Information Transfer and Utilization. This evaluator will review the experimental approaches developed by the project, analyze results, and advise on alternate methods. He will also examine the linkages between this and other project activities to suggest ways to improve the integration of all the related project elements. Evaluation of the project's training component also will be a function of this position. Both formal and informal (in-service) training activities will be assessed. This evaluator will have extensive experience in the field of information transfer including Central/South American experience (at least for some of the evaluations; relevant comparative experience in other parts of the world may prove useful in some of the evaluations).

(3) Replicable Production Areas (Analogs). This evaluator will look at developing methodologies, design of field experiments, and procedural approaches to analog identification and development. Data collection and summarization as well as the computations prepared at CATIE will be reviewed. Considered for this position will be senior researchers with relevant experience, biometricians/statisticians, and systems analysts, depending on the project's stage of development at the time of a particular evaluation.

VII. CONDITIONS, COVENANTS AND NEGOTIATING STATUS

A. IICA/PIADIC (Project 596-0048)

No special conditions or covenants are proposed for this project extension. IICA has reviewed this PP and has concurred in its content. An IICA letter of application is attached as Annex III.A.

B. CATIE (Project 596-0083)

In addition to the normal conditions, ROCAP will request CATIE to prepare an annual work plan for the first year of full-scale implementation, estimated to start six months after project signing (i.e., October 1 of each year). ROCAP will approve each year's plan. CATIE has reviewed this PP and is in agreement with its contents, including the administrative arrangements proposed. A CATIE letter of application is attached as Annex III.B.

CATIE's on-going activities in each country will continue under the new project and will be eligible for disbursement under the new financing, i.e. current CATIE staff, both at CATIE and in-country, and their on-going activities related to multiple-cropping will be financed prior to CATIE meeting the conditions precedent on activities which represent new areas of CATIE concern. This is to insure continuity of CATIE activities. Accordingly, the condition precedent to disbursement for project activities in participating countries will be construed to mean for those new activities which are not now underway.

LOGICAL FRAMEWORK

PROJECT TITLE & NUMBER: AGRICULTURAL RESEARCH AND INFORMATION SYSTEM 596-0048

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
SECTOR GOAL	**MEANS OF GOAL ACHIEVEMENT**		
To improve the regional conditions in which the rural poor will have increased outputs and income from the land they work	1. National and regional Ag reserchers, planners, and support service organizations, are receiving relevant data for understanding small farm problems, identifying appropriate solutions and technology, for determining priorities and for formulating policies beneficial to small farmers and the rural poor.	1. IICA/ROCAP review of the work being carried out in regional and national institutions.	1. C.A. national and regional organizations will continue to improve and expand priority agricultural information/ data and its use to benefit the rural poor.
	2. Researchers, planners and support service organizations are using the improved data bases information for designing research, for formulating policies and for planning which benefits the rural poor.	2. ROCAP/IICA review of the policies and services being provided.	2. The availability of improved information will stimulate the six countries to provide policies and services benecial to small farmers in improving their incomes and quality of life.
PROJECT PURPOSE			
To improve the collection, analysis and use of relevant small farm data on which improved research and planning action can be taken nationally and regionally in Central America.	1. The six government key national institutions are participating in the project and are working under approved operational plans and have representation on regional advisory committee.	1. IICA/ROCAP review with appropriate national and regional agencies.	1. The national governments of the six countries, through their appropriate ministries and agencies, will continue to support project efforts.

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	2. National and regional institutions are using standardize methodologies and procedures for data bases development and use and for improving information centers/systems development.	2. IICA/ROCAP review with appropriate national and regional agencies.	2. The national agencies in the six countries and regional agencies serving the area will continue to have and use resources to support project priorities in the information services.
	3. Key institutions in the six countries have acquired improved information management capability and are exchanging documental and numerical data nationally and regionally.	3. IICA/ROCAP review with appropriate national and regional agencies.	
	4. Information provided by improved methods and procedures is being used in research design, planning and policies benefitting the rural poor.	4. IICA/ROCAP review with appropriate national and regional agencies.	

LOGICAL FRAMEWORK

PROJECT TITLE & NUMBER: AGRICULTURAL RESEARCH AND INFORMATION SYSTEM 596-0048

OUTPUTS	END OF PROJECT STATUS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
1. National rural sector socio-economic statistical data are being collected using sample frame methodology in six countries.	- Six countries are using the area frames in a planned program of data collection - 200 technicians have received training and are participating in a planned program of data collection, handling and use. - Data collected by use of sample frames are being utilized in: a. RESEARCH DESIGN SUPPORT: by providing data bases for identifying major problems, and possible solutions, determining land use, cropping patterns, timing, costs and yields, machinery, labor and technology use, family and community organization, attitudes and measures of life style, and impact due to development efforts, etc. b. PLANNING: Land use, crop and livestock policies formulation, grain stocks management, agricultural support services, etc.	- IICA/ROCAP review with appropriate national agencies.	- National agricultural statistics amd data user institutions in CA countries will continue to support project priorities and efforts by the assignment of necessary, available resources.

OUTPUTS	END OF PROJECT STATUS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	c. FEEDBACK FROM SMALL FARMS AND THE RURAL POOR: Determining production and marketing problems; agricultural support services availability, use and benefits; and determining rural sector/rural poor attitudes, opinions and suggestions. d. EVALUATING: development assistance effectiveness, level of technology use, costs and productivity, quality of life, etc.		
2. Priority data bases are developed and used in support of research design and Ag sector planning.	1. Standardized methodologies have been developed and/or being used by researchers in the six countries for systematically improving priority data bases. 2. Supportive data bases in soils, climate, production, marketing and socioeconomics have been improved and made more useful for research, planning, packaging and making analogies.	- IICA/ROCAP review with CATIE and national research agencies	- national research organizations and CATIE will participate in the development, testing, verification, transferral and use of packaged recommendations.

OUTPUTS	END OF PROJECT STATUS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	3. Twelve area specific profiles of information and first approximation recommendations for crop production in specific areas have been developed by national agencies and are being tested, verified or modified by researchers and farmers.		
3. National information centers with improved numerical and documentary data control, memory, analysis and exchange are in operation in six countries, with at least three of the key national agricultural research and info institutions cooperating closely in using standardized methodologies.	- 200 national level technicians have received training in methodologies and procedures in data base development for the establishment of the national information centers networks. - A national thesaurus has been developed and is being used in each country. - In each of the six countries a national information centers network is in operation, with at least three of the key agricultural information institutions cooperating. - Information agencies in the network are using standardized methodologies for control, memory, analysis and use packaging of information.	- IICA/ROCAP review with appropriate national agencies.	- The CA national agricultural information organizations and data centers will continue to support project priorities and efforts by assignment of necessary available resources.

OUTPUTS	END OF PROJECT STATUS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	- The national information network in each country has provided for appropriate information and data interchange among CA countries and with CA regional and international agricultural information agencies.		
4. IICA will have the capacity to provide adequate follow-up technical and organizational assistance to national and regional organizations for continually upgrading Ag data bases and their use in support of research design and agricultural planning.	- IICA has the capability and has accepted the responsibility to provide follow-up assistance to the CA countries national and regional research and information agencies. - IICA is providing necessary management and supervision at the IICA institutional, regional and national activity level. - IICA has working in this effort no less than four full-time technical personnel, including project manager, three half-time technicians permanently assigned, plus ten technicians for short-term technical assistance for approximately 16 person/month per year.	- IICA/ROCAP review.	- IICA has required resources available.

OUTPUTS	END OF PROJECT STATUS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
	- IICA has resources to provide operational funds. - IICA has training and conference facilities available at its main headquarters for follow-up activities, and will provide coordinating office logistics in each country.		

INPUTS	TARGETS		VERIFICATION	IMPORTANT ASSUMPTIONS
	AID	IICA		
1. Technical Assistance	301 person months	181 person months	1. Review of personnel and fiscal records	1. AID and IICA budgets will be approved as planned
2. Commodities	one vehicle; one photocopier	---		
3. Operational Support	Travel, training materials, add-on data collection surveys, data management and methodologies development.	Facilities	2. Visual inspection 3. ROCAP/IICA evaluation in each country. 4. Evaluation and review of project records.	2. Project implementation will proceed in accordance with initial planning and budget projections.

C A T I E

SMALL FARM PRODUCTION SYSTEMS
(Project 596-0083)
Project Design Summary

Logical Framework

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
A. 1. Program of Sector Goal Improve the regional conditions in which the rural poor will have increased outputs and income from the land they work.	2. Measures of Goal Achievement Increases in crop and annual production, net profits and efficiency of utilization of available resources of small farms and improved nutrition and labor opportunities for the small farm family.	3. Means of Verification Results of baseline surveys, regional agricultural production analyses, national sector analyses, agricultural production census, national health and nutrition studies and other national or regional studies as done by the respective government agencies or Central American regional organizations.	4. Assumptions for Achieving Goal Targ The countries of the Central American isthmus willmaintain their interest in increasing opportunities for the rural poor and will manifest this through appropriate policies and development programs so that: a) The proper production inputs, in adequate quantities and at prices permitting profit at recommended rates are available to all farmers. b) An efficient infrastructure for the provision of production inputs and marketing of small farm outputs is available. c) Change agents will promote the cropping system and mixed crops-animal production systems developed and recommended.
B. 1. Project Purpose Develop a continuing Central American capability to conduct and convey to small farmers crop, animal, and mixed-farming production systems research.	2. End of Project Status National institutions will be conducting production system and transfer research as developed in conjunction with CATIE. Trained personnel within national institutions will be producing systems recommendations and exchanging this information with other countries of the isthmus. Modes for transferring Production Systems recommendation will have been developed and tested. The CA countries will have recognized the importance of production systems research and CATIE's leadership in this research area.	3. Means of Verification Survey of research projects on cropping and mixed farming systems in each country. Survey of personnel trained in and practicing production system research methodology. Surveys of small farmers' adoption of production systems in target areas. Review of national budget allocations for production system research. Review of CATIE's records of countries requests for CATIE's assistance in workshops, short courses, and graduate-level training, and requests for technical assistance and information on production system research.	4. Assumptions for Achieving Purpose Central American countries are interestd in developing production system and transfer research and sufficient resources will be available to national institutions to develop the capability necessary for such research and development.

C.

1. Project Outputs	2. Magnitude of Outputs	3. Means of Verification	4. Important Assumptions
a. Methodology for development of crop, animal and mixed farming systems recommendations.	a. One recommendation development methodology for animal and mixed farming; refinement of cropping system recommendation methodology.	a. Periodic evaluations, annual and final reports, publications.	a. The methodology evolved over the four-year period of recommendation development will be recommendable as a general methodology.
b. Crop, animal and mixed farming system recommendations for specific areas.	b. Ten cropping system, six animal system, and six mixed farming recommendations.	b. Documents detailing agricultural recommendations for 22 production systems and management options for those systems.	b. Small farmers and national agencies will collaborate to conduct on-farm experiments. Factors limiting farm production will be identifiable and solutions to such constraints can be found through research.
c. Baseline information and research results where small farms are concentrated.	c. Information on eighteen analogous geographic areas (replicable production areas).	c. Documents summarizing baseline information from each geographic area where research was carried out.	c. Climatological and other equipment to monitor the physical environment will be available when needed in the selected geographic areas. National institutions will collaborate to make available necesary data from surveys and socio-economic studies.
d. Extrapolation methodology for transfer of cropping systems recommendations from one geographic area to another.	d. One evaluated and disseminated extrapolation methodology.	d. A manual describing an extrapolation methodology and the evaluation of that methodology which includes experimental results.	d. Information gathered over a four-year period will be sufficient to define analogous areas and to quantitatively define the relationship between environments and cropping systems with sufficient precision to transfer recommendation from one geographic area to another.
e. Recommendations for transfer of production system tech-packs to small farmers.	e. Two thoroughly researched and tested transfer recommendations.	e. Documents describing information-transfer, research, tests, and recommendations.	e. Four and one half years will be sufficient time to study, analyze, and test information transfer processes. National institutions will collaborate in the study of information channels and the dissemination of tech-packs.
f. Formal training through short courses and graduate training.	f. Eight cropping system, four animal system and eight information transfer courses for national technical personnel; Master's level training for ten technicians from collaborating institutions.	f. List of short courses with the names and nationalities of participants. Copies of Master's theses written by graduate students who received scholarships through the project.	f. National institutions will select and release candidates for courses and graduate training.
g. In-service training through direct participation in field research.	g. Eighteen national research technicians.	g. Number of national technicians trained as reflected in project records and evaluation reports.	g. National institutions will collaborate and allow national technicians to participate in on-farm research.
h. Institutional capacity to continue technical assistance for production and transfer of recommendations.	h. CATIE permanent staff capable of advising and assisting national agencies.	h. Professional judgment as reflected in final evaluation report.	h. CATIE will retain qualified and experienced professional personnel and permanent staff.

D.

1. Project Inputs	2. Magnitude of Inputs ($000)				3. Means of Verification	4. Important Assumptions
	AID	CATIE	Other Donors	Nat. Inst.		
a. Personnel	4,801	2,106	1,672	4,375	a. Review of personnel and fiscal records.	a. AID, CATIE and OTher Donors program budgets are improved.
b. Commodities	408	196	79	2,200	b. Visual inspection.	
c. Training	328	--	504	--	c. ROCAP/CATIE evaluation	b. Program implementation will proceed in accordance with initial planning and budget projections.
d. Other Costs	1,866	634	138	1,200	d. Evaluation and review of project records.	
Total	7,403	2,936	2,393	7,805		

(D R A F T)

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

Name of Entity:

Central American Regional InterAmerican Institute for Agricultural Sciences

Name of Project: Agricultural Research and Information System

Number of Project: 596-0048

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize an additional grant to the InterAmerican Institute of Agricultural Sciences (IICA) of not to exceed five hundred thousand United States Dollars ($500,000) to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described hereinafter. The project consists of a cooperative and coordinated effort by regional and national institutions in Central America and Panama to (a) upgrade the quality of rural sector socio-economic, research and technological information, and orient that information toward meeting the needs of the rural poor; (b) standardize and improve national agricultural information services, increase the interchange of appropriate numerical data and documentary information among national agencies, and increase the effective use of that data and information in formulating policy and in developing programs and services to benefit the rural poor; and (c) improve the transfer of useful scientific and technological information to agricultural planners, service organizations, and researchers.

I approve the total level of A.I.D. appropriated funding planned for this project of not to exceed one million four hundred sixty-eight thousand United States Dollars ($1,468,000) during the period FY 1979 through FY 1981. This amount is in addition to the $1,929,000 previously authorized for the period FY 1975 through FY 1978. I approve further increments during the period FY 1980 through FY 1983 of grant funding up to $968,000, subject to the availability of funds in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

I. Source and Origin of Goods and Services

Except for ocean shipping, goods and services financed by A.I.D. under the project shall have their source and origin in the Central American Common Market, and countries included in A.I.D. Geographic Code 941, except as A.I.D. may otherwise agree in writing. Ocean shipping financed under the grant shall be procured in the United States.

II. Covenants

Except as A.I.D. shall otherwise agree in writing, IICA shall covenant to provide a full-time Project Director for the period April 1, 1979 through June 30, 1981 and such additional services and such goods as may be agreed upon between A.I.D. and IICA for a total value of not less than the equivalent of nine hundred seventy-seven thousand United States Dollars ($977,000) during the period April 1, 1979 through June 30, 1981.

Signature _____

Abelardo L. Valdez
Typed Name of Authorizing Officer

AA/LAC
Office Symbol

ANNEX II.A.
(Attachment)

(TM 3:19)
AOD 8A Ch 8 11B 3

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: [A] (A = ADD, C = CHANGE, D = DELETE) — PAF
2. DOCUMENT CODE: 5
3. COUNTRY/ENTITY: ROCAP - CENTRAL AMERICAN REGIONAL
4. DOCUMENT REVISION NUMBER: [5]
5. PROJECT NUMBER (7 digits): [596-0048]
6. BUREAU/OFFICE — A. SYMBOL: LAC; B. CODE: [05]
7. PROJECT TITLE (Maximum 40 characters): [AGRICULTURAL RESEARCH AND INFORMATION SYSTEM]
8. PROJECT APPROVAL DECISION — ACTION TAKEN: [A] (A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED)
9. EST. PERIOD OF IMPLEMENTATION (Extension Period only): YRS. [2] QTRS. [1]

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	D. LOAN	E. 1ST FY 75-78 F. GRANT	G. LOAN	H. 2ND FY 79 I. GRANT	J. LOAN	K. 3RD FY 80 L. GRANT	M. LOAN
(1) FN	200B	200		1929		500		758	
(2)									
(3)									
(4)									
TOTALS				1929		500		758	

A. APPROPRIATION	N. 4TH FY 81 O. GRANT	P. LOAN	Q. 5TH FY — R. GRANT	S. LOAN	LIFE OF PROJECT T. GRANT	U. LOAN
(1) FN	210				3397	
(2)						
(3)						
(4)						
TOTALS	210				3397	

11. PROJECT FUNDING AUTHORIZED (ENTER APPROPRIATE CODE(S)) — A. GRANT: 2; B. LOAN:
(1 = LIFE OF PROJECT, 2 = INCREMENTAL, LIFE OF PROJECT)
C. PROJECT FUNDING AUTHORIZED THRU FY: 81

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. C. GRANT	D. LOAN
(1)		
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT
TYPED NAME (Chief, S&R/FM/FSD)
SIGNATURE
DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [ ] 000 [X] 941 [ ] LOCAL [X] OTHER CA REGIONAL

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

(See attached authorization)

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

AID 1330-6 (7-76)

ANNEX II.A.
(Attachment)

(TM 3:19)
App 8A Ch 8 HB 3

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE) — PAF

2. DOCUMENT CODE: 5

3. COUNTRY/ENTITY: ROCAP - CENTRAL AMERICAN REGIONAL

4. DOCUMENT REVISION NUMBER: 5

5. PROJECT NUMBER (7 digits): 596-0048

6. BUREAU/OFFICE: A. SYMBOL: LAC; B. CODE: 05

7. PROJECT TITLE (Maximum 40 characters): AGRICULTURAL RESEARCH AND INFORMATION SYSTEM

8. PROJECT APPROVAL DECISION — ACTION TAKEN: A (A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED)

9. EST. PERIOD OF IMPLEMENTATION (Extension Period only): YRS. 2 QTRS. 1

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	D. LOAN	E. 1ST FY 75-78 F. GRANT	G. LOAN	H. 2ND FY 79 I. GRANT	J. LOAN	K. 3RD FY 80 L. GRANT	M. LOAN
(1) FN	200B	200		1929		500		758	
(2)									
(3)									
(4)									
TOTALS				1929		500		758	

A. APPROPRIATION	N. 4TH FY 81 O. GRANT	P. LOAN	Q. 5TH FY __ R. GRANT	S. LOAN	LIFE OF PROJECT T. GRANT	U. LOAN
(1) FN	210				3397	
(2)						
(3)						
(4)						
TOTALS	210				3397	

11. PROJECT FUNDING AUTHORIZED: ENTER APPROPRIATE CODE(S): 1 = LIFE OF PROJECT, 2 = INCREMENTAL, LIFE OF PROJECT — A. GRANT: 2; B. LOAN:

C. PROJECT FUNDING AUTHORIZED THRU: FY 81

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. ____ C. GRANT	D. LOAN
(1)		
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT

TYPED NAME (Chief, SRD/FM/FSD)

SIGNATURE

DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [ ] 000 [X] 941 [ ] LOCAL [X] OTHER CA REGIONAL

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

(See attached authorization)

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (optional)	ACTION REFERENCE DATE MM DD YY

AID 1330-4 (7-76)

ANNEX II.B.
(Attachment)

(TM 3:19)
Add 8A Ch 8 11B 5

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: [A] (A = ADD, C = CHANGE, D = DELETE) — PAF
2. DOCUMENT CODE: 5
3. COUNTRY/ENTITY: ROCAP - CENTRAL AMERICAN REGIONAL
4. DOCUMENT REVISION NUMBER:
5. PROJECT NUMBER (7 digits): [596-0083]
6. BUREAU/OFFICE: A. SYMBOL: LAC; B. CODE: [05]
7. PROJECT TITLE (Maximum 40 characters): [SMALL FARM PRODUCTION SYSTEMS]
8. PROJECT APPROVAL DECISION — ACTION TAKEN: [A] (A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED)
9. EST. PERIOD OF IMPLEMENTATION: YRS. [4] QTRS. [2]

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	PRIMARY TECH. CODE D. LOAN	E. 1ST FY 79 F. GRANT	E. 1ST FY 79 G. LOAN	H. 2ND FY 80 I. GRANT	H. 2ND FY 80 J. LOAN	K. 3RD FY 81 L. GRANT	K. 3RD FY 81 M. LOAN
(1) FN	211B	023		940		1665		1665	
(2)									
(3)									
(4)									
TOTALS				940		1665		1665	

A. APPROPRIATION	N. 4TH FY 82 O. GRANT	N. 4TH FY 82 P. LOAN	Q. 5TH FY 83 R. GRANT	Q. 5TH FY 83 S. LOAN	LIFE OF PROJECT T. GRANT	LIFE OF PROJECT U. LOAN
(1) FN	1665		1468		7403	
(2)						
(3)						
(4)						
TOTALS	1665		1468		7403	

11. PROJECT FUNDING AUTHORIZED — GRANT / LOAN
ENTER APPROPRIATE CODE(S)) 1 = LIFE OF PROJECT, 2 = INCREMENTAL, LIFE OF PROJECT: 2
C. PROJECT FUNDING AUTHORIZED THRU FY: 83

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. C. GRANT	B. ALLOTMENT REQUEST NO. D. LOAN
(1)		
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT
TYPED NAME (Chief, SER/EM/FSN):
SIGNATURE:
DATE:

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [ ] 000 [X] 941 [ ] LOCAL [X] OTHER CA REGIONAL

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

(See attached authorization.)

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

AID 1330-6 (7-76)

ANNEX II.B.
(Attachment)

(TM 3:19)
App 8A Ch 3 IIB 3

AGENCY FOR INTERNATIONAL DEVELOPMENT
PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I

1. TRANSACTION CODE: A (A = ADD, C = CHANGE, D = DELETE) — PAF

2. DOCUMENT CODE: 5

3. COUNTRY/ENTITY: ROCAP - CENTRAL AMERICAN REGIONAL

4. DOCUMENT REVISION NUMBER: [ ]

5. PROJECT NUMBER (7 digits): [596-0083]

6. BUREAU/OFFICE: A. SYMBOL: LAC; B. CODE: [05]

7. PROJECT TITLE (Maximum 40 characters): [SMALL FARM PRODUCTION SYSTEMS]

8. PROJECT APPROVAL DECISION — ACTION TAKEN: A (A = APPROVED, D = DISAPPROVED, DE = DEAUTHORIZED)

9. EST. PERIOD OF IMPLEMENTATION: YRS. 4 QTRS. 2

10. APPROVED BUDGET AID APPROPRIATED FUNDS ($000)

A. APPRO-PRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE C. GRANT	D. LOAN	E. 1ST FY 79 F. GRANT	G. LOAN	H. 2ND FY 80 I. GRANT	J. LOAN	K. 3RD FY 81 L. GRANT	M. LOAN
(1) FN	211B	023		940		1665		1665	
(2)									
(3)									
(4)									
		TOTALS		940		1665		1665	

A. APPRO-PRIATION	N. 4TH FY 82 O. GRANT	P. LOAN	Q. 5TH FY 83 R. GRANT	S. LOAN	LIFE OF PROJECT T. GRANT	U. LOAN
(1) FN	1665		1468		7403	
(2)						
(3)						
(4)						
TOTALS	1665		1468		7403	

11. PROJECT FUNDING AUTHORIZED — A. GRANT / B. LOAN
ENTER APPROPRIATE CODE(S): 1 = LIFE OF PROJECT; 2 = INCREMENTAL, LIFE OF PROJECT — 2
C. PROJECT FUNDING AUTHORIZED THRU FY 83

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED ($000)

A. APPROPRIATION	B. ALLOTMENT REQUEST NO. ____ C. GRANT	D. LOAN
(1)		
(2)		
(3)		
(4)		
TOTALS		

13. FUNDS RESERVED FOR ALLOTMENT
TYPED NAME (Chief, SER/FM/FSD)
SIGNATURE
DATE

14. SOURCE/ORIGIN OF GOODS AND SERVICES: [ ] 000 [X] 941 [ ] LOCAL [X] OTHER CA REGIONAL

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

(See attached authorization.)

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY

AID 1330-4 (7-78)

PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

Name of Entity:	Tropical Agricultural Research and Training Center
Name of Project:	Small Farmer Production Systems
Project Number :	596-0083

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a grant to the Tropical Agricultural Research and Training Center (CATIE) of not to exceed Nine Hundred Forty Thousand United States Dollars ($940,000) to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described hereinafter. The project consists of a cooperative and coordinated effort by CATIE and national research institutions in Central America and Panama to undertake a regional program of agricultural research which (a) places priority on the special needs of small farmers; (b) focuses on the whole farm system of the small farmer and the interrelationships among technology, service institutions, and economic, social, and cultural factors affecting small farm agriculture; (c) makes extensive use of field conditions; and (d) places special emphasis on developing methodology for dissemination of research results and recommendations to other small farms in the vicinity and in other similar areas of small farmer agriculture in Central America and Panama (the "Project").

I approve the total level of A.I.D. appropriated funding planned for this project of not to exceed Seven Million Four Hundred and Three Thousand United States Dollars ($7,403,000) during the period FY 1979 through 1983. I approve further increments during the period FY 1980 through FY 1983 of grant funding up to $6,463,000, subject to the availability of funds in accordance with A.I.D. allotment procedures.

I hereby authorize the initiation of negotiation and execution of the Project Agreement by the officer to whom such authority has been delegated in accordance with A.I.D. regulations and Delegations of Authority subject to the following essential terms and covenants and major conditions, together with such other terms and conditions as A.I.D. may deem appropriate.

I. Source and Origin of Goods and Services

Except for ocean shipping, goods and services financed by A.I.D. under the Project shall have their source and origin in the Central American Common Market or in countries included in A.I.D. Code 941. Ocean shipping financed under the grant shall be procured in the United States.

II. Applicability of Conditions Precedent

Activities which were financed under the A.I.D. Grant for Small Farmer Cropping Systems (Project No. 596-0064) and which will be on-going under the Project authorized herein may continue to be financed prior to the time CATIE meets the conditions precedent set forth in this authorization, provided the amount committed does not exceed $500,000.

III. Conditions Precedent to Disbursement for Project Activities in Participating Countries

Except as A.I.D. may otherwise agree in writing, prior to any disbursement or to the issuance of any commitment documents under the Project Grant Agreement to finance Project activities in a participating country, CATIE shall furnish in form and substance satisfactory to A.I.D.:

A. An executed working agreement with the designated research organization with which it proposes to work in each country; and

B. A detailed work plan for the first year of the Project in each country with all work plans to be furnished to A.I.D. within three (3) months of the date of execution of the Project Grant Agreement.

IV. Covenants

Except as A.I.D. shall otherwise agree in writing, CATIE shall covenant:

A. To provide such additional services and such goods as may be agreed upon between A.I.D. and CATIE for a total value of not less than the equivalent of Two Million Nine Hundred Thirty-six Thousand United States Dollars ($2,936,000) during the period April 1, 1979 through September 30, 1983.

That prior to undertaking project activities in each country each year after the first year of the Project, it shall furnish in form and substance satisfactory to A.I.D. a detailed work plan for that year.

Abelardo I. Valdez
Assistant Administrator for
Latin America and the Caribbean

Date

INCOMING
DEPARTMENT OF STATE

ANNEX III.A
Page 1 of 1

TELEGRAM

AMERICAN EMBASSY GUATEMALA

UNCLASSIFIED

VV ESA937JOA334
OO RUESGT
DE RUESJO #0109 0091443
ZNR UUUUU ZZH
O R 091435Z JAN 79
FM AMEMBASSY SAN JOSE
TO RUESGT/AMEMBASSY GUATEMALA IMMEDIATE 5088
INFO RUEHC/SECSTATE WASHDC 3367
BT
UNCLAS SAN JOSE 0109

9 JAN 79 15 06Z

IMMEDIATE

ACTION: HECHTMAN
INFO: VENEZIA
FIESTER

	ACTION	INFO
AMB		
DCM		
POL		
ECON		
CHRON		
AID		
PAS	X	
PRM		
PC		
IAO		
MILGP		
AGR		
CSO		
B&F		
PER		
HSO		
CRM		
NRC		
FILE		
ACTION TAK		
DATE:		
INITIALS:		

ACTION TAKEN:
DATE:
INIT:

AIDAC

GUATEMALA FOR ROCAP

EO 12065: N/A
SUBJ: REGIONAL CENTRAL AMERICA AGRICULTURAL ~~RESEARCH~~ AND INFORMATION PROGRAM (PIADIC)

1. TODAY THE FOLLOWING LETTER WAS RECEIVED FROM JOSE EMILIO ARAUJO, DIRECTOR GENERAL OF THE INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES (IICA), ADDRESSED TO HARRY ACKERMAN, DIRECTOR, REGIONAL OFFICE FOR CENTRAL AMERICAN PROGRAMS (ROCAP):

2. "DEAR MR. ACKERMAN: THE IICA STAFF HAVE REVIEWED AND DISCUSSED

THE REGIONAL CENTRAL AMERICAN AGRICULTURAL RESEARCH AND INFORMATION PROGRAM DOCUMENT THAT HAS BEEN PREPARED BY ROCAP, REQUESTING SUPPORT FOR PROJECT 596-0048 (AGRICULTURAL RESRARCH AND INFORMATION SYSTEM) AND PROJECT 596-0083 (SMALL FARMER PRODUCTION SYSTEMS).

IICA AGREES WITH ROCAP AND THE CA MINISTRIES OF AGRICULTURE THAT MUCH PROGRESS HAS BEEN MADE TO-DATE IN THE IICA/ROCAP PIADIC PROJECT, HOWEVER, ADDITIONAL TIME AND SUPPORT FROM AID IS NEEDED TO ASSURE THE INSTITUTIONALIZATION OF VITAL AGRICULTURAL INFORMATION AND RESEARCH SYSTEMS SUFFICIENTLY TO PROVIDE THE INFORMATION NECESSARY TO EFFECTIVELY AND EFFICIENTLY UTILIZE THE RESOURCES OF CENTRAL AMERICA IN A MANNER TO MOBILIZE THE RURAL POOR IN THE DEVELOPMENT PROCESS.

WE ARE IN AGREEMENT WITH THE PHILOSOPHY, APPROACH AND OBJECTIVES OF THE PROJECTS AS PRESENTED IN THE DOCUMENT, AND ARE PLEASED TO SEE THE TWO HIGHLY INTERRELATED ROCAP/IICA AND ROCAP/CATIE PROJECTS PRESENTED IN ONE DOCUMENT FOR AID/WASHINGTON CONSIDERATION. ALTHOUGH EACH PROJECT HAS ITS DESTINCTIVE OBJECTIVES, THE TWO FIT AND WORK TOGETHER TO IDENTIFY MAJOR PROBLEMS IN THE SMALL FARM RURAL SECTOR AND TO FIND AND FOSTER THE APPLICATION OF APPROPRIATE SOLUTIONS TO THOSE PROBLEMS.

THE PROJECTS FIT WELL WITHIN THE LINES OF WORK AND CAPABILITY OF IICA. WE PLACE HIGH PRIORITY ON THE ROCAP/AID FUNDED ACTIVITY AND WILL BE LOOKING FORWARD TO CONTINUING TO WORK WITH ROCAP IN THIS RURAL SECTOR DEVELOPMENT EFFORT THAT IN SUPPORTIVE TO IMPROVING THE QUALITY OF LIFE OF THE CA RURAL POOR.

SORRY I MISSED YOU LAST WEEK WHILE YOU WERE IN COSTA RICA AND WILL BE LOOKING FORWARD TO YOUR NEXT VISIT. SINCERELY YOURS, JOSE EMILIO G. ARAUJO, DIRECTOR GENERAL"

WEISSMAN

JAN 8 10 53 AM '79

CATIE
TURRIALBA

CENTRO AGRONOMICO TROPICAL DE INVESTIGACION Y ENSEÑANZA

TURRIALBA, COSTA RICA

Cable: CATIE
Teléfonos:
56-01-22 56-01-49

CT/D-729

July 28, 1978

Mr. Harry Ackerman
Director, ROCAP
C/o American Embassy
Guatemala, GUATEMALA

Dear Mr. Ackerman:

I am writing in reference to our mutual interest in the ongoing small farm cropping systems activities and the expansion of those activities to embrace whole farm production systems.

As you know, the Small Farm Cropping Systems Project, which CATIE undertook in 1974 in accordance with the reorientation of its research activities towards improving the living conditions of the small farmers, and which AID/ROCAP has been supporting since 1975, is scheduled for completion as planned in early 1979. For some time we have been thinking about expanding this effort through a follow-on activity which would continue the work begun with multiple cropping systems and would go beyond this to address small farm animal systems and their integration with cropping systems to form the basis for whole farm production systems. Such an expanded effort would build on the experience and success of the current Cropping Systems Project.

I think you share with me the satisfaction of having seen the influence of the Cropping Systems Project spread throughout Central America. As was hoped at the outset, this Project has been able to develop research methodologies consonant with the physical and socio-economic conditions prevailing in Central America, and to transform cropping systems research into technological packages applicable by small farmers.

At the beginning of the Cropping Systems Project, CATIE was not so well known in the region as it should have been, and its services were not reaching many potential beneficiaries. Through the Project, fortunately this situation has been remedied. In addition to the many technical personnel through whom CATIE has been able to lend assistance to the countries participating in the Project, the Center now has at least one full-time resident

representative in each country. At the recent annual meeting of the "Programa Cooperativo Centroamericano para el Mejoramiento de Cultivos Alimenticios", I was very pleased to note that all the participants were aware of the cropping systems approach and were conscious of CATIE's role in developing and promoting this approach.

The very thorough evaluation of the Cropping Systems Project carried out last year, concluded that "The Small Farm Cropping Systems Project should be considered as the initial step toward the building of a farming system design capability at the country level in Central America, with emphasis on small farms. The necessary personnel and experience being put together to meet the short-run objectives of the actual program constitute an investment which could be more efficiently utilized by driving toward longer-run objectives." These longer-term objectives are our concern at the moment.

Over the past year CATIE has been working to conceptualize and outline a plan to broaden the horizons of the systems approach. Recently my staff has been together with yours working out the details of this plan which I am now prepared to propose to you with an official request for A.I.D. assistance to implement it as a new project activity.

We foresee a Project of about four years in duration with an estimated total cost of approximately US$16,000,000 which could be later increased. CATIE is prepared to make available a full-time liaison officer under the Subdirection of Research as well as additional professional and other support staff. CATIE will also make available the necessary office space, laboratory facilities, land for research trials, and supporting transportation, communications, and managerial and related services. The value of CATIE's contribution over the life of the Project is estimated at US$3,000,000.

AID/ROCAP is requested to contribute around US$7,000,000 primarily to fund the additional staff, and related support costs (travel and transportation), to insure the levels of technical assistance necessary for Project success. Upon the conclusion of the Project in 1983, CATIE would expect to incorporate the core staff needed to give the proper backstopping to the countries in order to permit the long-term continuation of the activities developed by the Project. A.I.D. funding will also be used to support training, the procurement and distribution of essential research products, and other operational support costs.

CATIE will, of course, establish the necessary Project agreements with the six participating countries. I expect these working relationships to be similar to those established for the Cropping Systems Project. The expected contribution of the countries to the Project is valued at some US$3,500,000 (or about US$150,000 per country per year) representing the professional staff services and research costs associated with Project participation.

From negotiations with other potential contributors to the Project (OAS, IDRC, ODM and IPPC among others), CATIE expects additional contributions (mainly through complementary increases of the Project professional staff) of about US$2,500,000. I might note also that our developing research methodologies, including field tests on actual small farms throughout the region, entail a valuable contribution from the small farmers who will be actively participating in the new Project.

I think you will agree that the number of contributors to this Project reflects the growing interest in the systems approach. I expect that as one of the benefits of the new Project, through generating additional enthusiasm as we broaden the systems approach to encompass small farm animals and to integrate research in this area with that of cropping systems, will be to assist small farmers in developing their total farming systems. A key element in the new Project will be the special attention given to the information transfer mechanisms which are critical in extending the benefits of systems research to the end users on small farms throughout Central America. Another promising activity will be the development of a methodology for extrapolating research results from one area to analogous areas, thus reducing the total research costs and more rapidly spreading the research benefits among the region's small farmers.

I have been very pleased with the encouraging progress that CATIE and the Central American countries have made in the Cropping Systems Project, and I look forward to continued collaboration with AID/ROCAP as we extend our objectives and advance toward the development of small farm production systems.

Sincerely yours,

S. Fonseca

Santiago Fonseca Martínez
Director of CATIE

c.c. Dr. Edwin J. Wellhausen - President, CATIE's Board of Directors

TURRIALBA

CENTRO AGRONOMICO TROPICAL DE INVESTIGACION Y ENSEÑANZA
TURRIALBA, COSTA RICA

Cable: CATIE
Teléfonos:
56-01-22 56-01-69

D-07

4 January 1978

Mr Harry Ackerman
Director
Regional Office for Central American Programs
AID
Guatemala, GUATEMALA

Dear Mr. Ackerman:

In reference to our letter dated July 28th, 1978, we have, in a joint meeting ROCAP/CATIE, reviewed the document to be presented to the consideration of AID/Washington.

I would like to inform you that CATIE is in agreement with the general contents of the document.

It is our feeling that the proposed interaction between CATIE and PIADIC will be profitable, and will ensure a better use of the data available, as well as it will complement the other actions and activities being conducted in the region, towards improving the living conditions of the small farmers of the area.

It is also our hope that this new contribution from AID will strengthen the national institutions in the countries involved, and make them self-capable of leading the development of the rural sector.

I avail myself of this opportunity to send you my best regards.

Yours sincerely,

P/ Hector Fonseca

Santiago Fonseca Martínez
Director del CATIE

EL/HM/gd

INCOMING
DEPARTMENT OF STATE

TELEGRAM

AMERICAN EMBASSY GUATEMALA

ROCAP

UNCLASSIFIED

IMMEDIATE

ACTION

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OO RUESGT
DE RUEMC #9445/1 2412359
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TO RUESGT/AMEMBASSY GUATEMALA IMMEDIATE 3344
INFO RUESNG/AMEMBASSY MANAGUA IMMEDIATE IMMEDIATE 2607
RUEHZP/AMEMBASSY PANAMA IMMEDIATE 1623
RUESJO/AMEMBASSY SAN JOSE IMMEDIATE 4908
RUESAL/AMEMBASSY SAN SALVADOR IMMEDIATE 3097
RUESTE/AMEMBASSY TEGUCIGALPA IMMEDIATE 3856
BT

29 Aug 78 21 18z

UNCLAS STATE 219445

ACTION: FIESTER
INFO: VENEZIA
HECHTMAN

AIDAC; GUATEMALA FOR ROCAP

E.O. 11652: N/A

TAGS:

SUBJECT: DAEC REVIEW - AGRICULTURAL RESEARCH AND INFORMATION--ROCAP

THE DAEC REVIEWED THE SUBJECT PP ON AUGUST 11, 1978. SERIOUS CONCERNS WERE EXPRESSED WITH THE NUMBER OF PROJECTS IN CENTRAL AMERICA WHICH ADDRESS AGRICULTURAL RESEARCH AND APPROPRIATE TECHNOLOGY, AND THE CORRESPONDING POTENTIAL FOR DUPLICATION OF ACTIVITIES. THE SUBJECT PROJECT DESCRIBES ACTIVITIES WHICH APPEAR SIMILAR TO OTHER REGIONAL OR BILATERAL PROGRAMS WHICH ARE ALSO FOCUSING ON LIGHT CAPITAL TECHNOLOGY, SMALL FARMER TECHNOLOGY, AGRICULTURAL RESEARCH, OR SCIENCE AND TECHNOLOGY INFORMATION TRANSFER. THE DAEC RECOGNIZED THE NEED FOR AN AGRICULTURAL RESEARCH STRATEGY WHICH WOULD ENCOMPASS ALL OF THESE PROJECTS AND WOULD DESCRIBE NOT ONLY THE RELATIONSHIP OF THE IMMEDIATE PROJECT TO OTHERS IN THE AREA, BUT ALSO THE INTERRELATIONSHIP OF ALL AGRICULTURAL RESEARCH, APPROPRIATE TECHNOLOGY, AND INFORMATION TRANSFER PROGRAMS IN CENTRAL AMERICA. SUCH A CONCEPTUAL FRAMEWORK WOULD NECESSARILY INVOLVE THE IDENTIFICATION OF NATIONAL AND REGIONAL INSTITUTIONS PARTICIPATING IN THESE PROGRAMS, HOW THEY RELATE TO EACH OTHER IN THE COLLECTION, ANALYSIS, DESIGN AND DELIVERY

OF APPROPRIATE TECHNOLOGIES, AND HOW THE RESULTANT INFORMATION/TECHNOLOGIES ARE DISSEMINATED TO THE END USER IN THE HOST COUNTRY. IN VIEW OF ROCAP'S PROPOSED ROLE IN PROMOTING COOPERATION BETWEEN CENTRAL AMERICAN REGIONAL INSTITUTIONS AND THEIR NATIONAL COUNTERPARTS, WHOSE ACTIVITIES MAY ALSO BE SUPPORTED BY BILATERAL AID EFFORTS, IT WAS AGREED THAT ROCAP COULD MOST APPROPRIATELY PROVIDE THE LEADERSHIP IN DEVELOPING A REQUISITE RESEARCH STRATEGY FOR AID ACTIVITIES IN CENTRAL AMERICA. THE STRATEGY WOULD PROVIDE A CONCEPTUAL FRAMEWORK WITHIN WHICH FIELD MISSIONS CAN DESIGN AND IMPLEMENT RESEARCH AND TECHNOLOGY PROJECTS

AND ALSO WOULD ENABLE AID/W TO REVIEW INDIVIDUAL PROJECTS WITHIN THE CONTEXT OF A BROADER REGIONAL EFFORT. DURING THE NEXT FEW WEEKS AID/W WILL ASSIST ROCAP PREPARE A DISCUSSION PAPER TO BE DISTRIBUTED TO THE MISSIONS FOR THEIR REVIEW AND COMMENTS. ALTERNATIVE RESEARCH STRATEGIES EMERGING FROM THIS REVIEW COULD SUBSEQUENTLY BE DISCUSSED, POSSIBLY IN CONNECTION WITH THE UPCOMING RDCC MEETING TENTATIVELY SCHEDULED FOR LATE SEPTEMBER. ADDITIONAL DETAILS WILL FOLLOW SEPTEL.

2/219445

THE DAEC APPROVED FY 78 FINANCING OF DOLS. 225,000 FOR THE SUBJECT PROJECT AND WILL CONSIDER INTERIM FY 79 FINANCING OF ESSENTIAL PROJECT ACTIVITIES FOR WHICH FUNDS WILL BE OBLIGATED PRIOR TO DECEMBER 31, 1978. HOWEVER, BECAUSE THE ABOVE STRATEGY STATEMENT IS CONSIDERED TO BE ESSENTIAL TO SUCCESSFUL DEVELOPMENT OF RESEARCH AND TECHNOLOGY PROGRAMS IN CENTRAL AMERICA, THE DAEC DETERMINED THAT FUNDING SUBSEQUENT TO DECEMBER 31 WOULD BE CONTINGENT ON THE SUBMISSION OF A REVISED PP WHICH CONTAINS A CONCEPTUAL FRAMEWORK AND STRATEGY FOR AGRICULTURAL RESEARCH ACTIVITIES IN CENTRAL AMERICA AND WHICH INCORPORATES THE FOLLOWING:

1. COORDINATION. THE PP SHOULD DESCRIBE THE RELATIONSHIP OF THIS PROJECT TO OTHER AGRICULTURAL RESEARCH AND TECHNOLOGY PROJECTS IN CENTRAL AMERICA AND HOW IT IS SUPPORTIVE OF AID'S STRATEGY IN THIS AREA.

2. TARGET GROUP. THE PP INDICATES THAT THE BENEFITS OF THIS PROJECT WILL BE DIRECTED AT THE SMALL FARMER, BUT NO OPERATIONAL DEFINITION OF THE SMALL FARMER IS PROVIDED, NOR ARE HIS INFORMATION NEEDS IDENTIFIED. SOME PROJECT ACTIVITIES APPEAR TO BE SCALE NEUTRAL, WHILE OTHERS MAY BE BIASED IN FAVOR OF THE SMALL FARMER. THE REVISED PP SHOULD PROVIDE SOME CHARACTERIZATION OF THE TARGET GROUP, INCLUDING A WORKING DEFINITION OF THE SMALL FARMER, AND AN IDENTIFICATION OF HIS INFORMATION REQUIREMENTS. THE PP SHOULD ALSO DISCUSS THE DIRECT AND INDIRECT BENEFITS WHICH ARE EXPECTED TO ACCRUE TO THE SMALL FARMER AND IDENTIFY OTHER GROUPS WHICH WILL ALSO BENEFIT FROM THE VARIOUS PROJECT ACTIVITIES.

3. SMALL FARM TECHNOLOGY SURVEYS. THE PP PROPOSES TO FINANCE AN APPROPRIATE TECHNOLOGY SURVEY TO BE CARRIED OUT IN PHASE FOUR, BUT DOES NOT IDENTIFY WHO WILL CONDUCT THE SURVEY OR THE RATIONALE FOR CONDUCTING IT INDEPENDENTLY OF OTHER ONGOING SURVEYS, E.G., THE AREA FRAME SAMPLE SURVEY IN COSTA RICA. THE REVISED PP SHOULD DISCUSS THE SURVEY SYSTEMS PRESENTLY OPERATIONAL IN EACH PARTICIPANT COUNTRY, WHERE AND TO WHAT EXTENT ADDITIONAL SURVEY INFORMATION IS NEEDED, AND THE FEASIBILITY OF ADDING AN APPROPRIATE TECHNOLOGY ELEMENT TO EXISTING QUESTIONNAIRES. THE ANTICIPATED COST TO IICA OF SUPPLEMENTING EXISTING SURVEY ACTIVITIES WHERE FEASIBLE, OR FINANCING SEPARATE APPROPRIATE TECHNOLOGY SURVEYS WHERE NECESSARY, SHOULD THEN BE DETERMINED. THE INTEREST AND COMMITMENT OF PARTICIPATING GOVERNMENTS TO CONTRIBUTE FUNDS FOR AN APPROPRIATE TECHNOLOGY SURVEY, EITHER SEPARATELY OR AS A COMPONENT OF EXISTING SURVEY INSTRUMENTS SHOULD ALSO BE EXAMINED.

219445/3

4. TECH PACKS. THE SUBJECT PROJECT SPEAKS OF THE DEVELOPMENT OF CROP-SPECIFIC TECHNOLOGY PACKAGES FOR USE BY THE SMALL FARMER, BUT DOES NOT DISCUSS THE RATIONALE FOR PREFERRING THIS APPROACH TO MULTO-CROPPING TECH. PACKS, WHICH HAVE BEEN USED SUCCESSFULLY IN VARIOUS PARTS OF ASIA AND ARE CURRENTLY BEING DEVELOPED BY CATIE. THE REVISED PP SHOULD DISCUSS THE BASIS UPON WHICH MONO-CULTURAL TECH PACKS WERE SELECTED, THE AVAILABILITY OF TECHNICAL EXPERTISE FOR DEVELOPING THIS METHODOLOGY, AND THE RELATIONSHIPS BETWEEN THE MONO AND MULTICULTURAL RESEARCH ACTIVITIES OF IICA AND CATIE IN CENTRAL ATERICA WITH REGARD TO THE TARGET GROUPS TO BE SERVED AND THE RESOURCES AND PERSONNEL USED TO DEVELOP THEIR RESPECTIVE TECH PACKS. A DESCRIPTION OF THE EXTENSION WORKER'S ROLE IN THE DELIVERY OF THE TECH PACK TO THE SMALL FARMER SHOULD ALSO BE INCLUDED.

5. DISSEMINATION OF INFORMATION. WHILE THE PP DESCRIBES THE INSTITUTIONAL NETWORK FOR GATHERING AND ANALYZING TECHNOLOGY INFORMATION, THERE IS NO DISCUSSION OF HOW THIS INFORMATION WILL ACTUALLY BE TRANSFERRED TO THE TARGET GROUP. THE REVISED PP SHOULD DESCRIBE THE LINKAGE BETWEEN DATA COLLECTION AND THE END USER, AND

WHAT ROLE THE NATIONAL AND REGIONAL INSTITUTIONS WILL PLAY IN THE DISSEMINATION OF RESEARCH INFORMATION.

6. ECONOMIC ANALYSIS. ALTHOUGH THE NATURE OF THIS PROJECT DOES NOT READILY LEND ITSELF TO COST/BENEFIT ANALYSES, THE DAEC FELT THAT SOME METHODOLOGICAL FRAMEWORK FOR THE DEVELOPMENT OF A REPRESENTATIVE TECH PACK COULD BE PROVIDED. THE REVISED PP SHOULD INCLUDE AN ILLUSTRATIVE ECONOMIC ANALYSIS FOR AT LEAST ONE TECH PACK IN ORDER TO PROVIDE SOME MEASURE OF ECONOMIC FEASIBILITY.

7. PROJECT FUNDING. THE REVISIONS TO BE MADE IN THE PROPOSED PROJECT MAY ENTAIL ADDITIONAL COSTS, AND THE REVISED PP SHOULD REFLECT ANY NEW FINANCIAL REQUIREMENTS. IN ADDITION TO A POSSIBLE MODIFICATION OF SURVEY COSTS, ROCAP MAY WISH TO CONSIDER FUNDING TWO SOCIAL ANTHROPOLOGISTS TO ASSIST IN IDENTIFYING TARGET GROUPS AND THEIR INFORMATION NEEDS. CHRISTOPHER
BT
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INCOMING
DEPARTMENT OF STATE

TELEGRAM

AMERICAN EMBASSY GUATEMALA

ROCAP

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ZNR UUUUU ZZH
R 2114577 OCT 78
FM SECSTATE WASHDC
TO RUESGT/AMEMBASSY GUATEMALA 3933
RUESJO/AMEMBASSY SAN JOSE 5472
RUESTE/AMEMBASSY TEGUCIGALPA 4371
RUESNG/AMEMBASSY MANAGUA SAN SALVADOR 3240
RUEHZP/AMEMBASSY PANAMA 2420
BT

ACTION: HECHTMAN
INFO: ACKERMAN
VENEZIA
FIESTER

UNCLAS STATE 267752

AIDAC GUATEMALA FOR USAID AND ROCAP

E.O. 11652: N/A

TAGS:

SUBJECT: 1980 ABS REVIEW

REF: (A) STATE 231291 (B) STATE 241831

1. THE ROCAP ABS WAS REVIEWED ON JUNE 5, 1978. FOLLOWING ARE PROJECT DESIGN RECOMMENDATIONS RESULTING FROM THAT MEETING.

A. SMALL FARM PRODUCTION SYSTEMS: THE PP SHOULD SPECIFY INSTITUTIONAL LINKAGES BETWEEN CATIE AND HOST COUNTRY RESEARCH AND EXTENSION SYSTEMS AND DISCUSS HOW THIS PROJECT WILL COMPLEMENT AND NOT DUPLICATE BILATERALLY SUPPORTED EFFORTS. EXTENSION SERVICES ARE TO BE DELIVERED THROUGH NATIONAL MECHANISMS. IN VIEW OF CLOSE INSTITUTIONAL AND BENEFICIARY RELATIONSHIPS OF HORTICULTURE RESEARCH ACTIVITY TO THIS PROJECT, INCLUDING THE USE OF THE SOILS AND CROPPING ANALOGUES DATA, THE REVIEW PROPOSED THAT HORTICULTURE ACTIVITY CURRENTLY PROPOSED FOR 1980 BE INCLUDED AS A COMPONENT OF THIS PP WITH POSSIBLE PHASING OF START-UP OF HORTICULTURE ACTIVITIES OVER NEXT SEVERAL YEARS. MISSION IS ADVISED TO REVIEW PRESENT AND PROPOSED HORTICULTURE ACTIVITIES IN CENTRAL AMERICA, AND PROVIDE RATIONALE FOR FURTHER HORTICULTURE RESEARCH IN VIEW OF ON-GOING AND

PROPOSED ACTIVITIES (I.E., IN COSTA RICA UNDER COMMODITY SYSTEMS LOAN). THE PP SHOULD DESCRIBE THE INTER-RELATIONSHIPS OF THESE VARIOUS ACTIVITIES AND THE PROPOSED ROLE OF CATIE IN HORTICULTURE RESEARCH UNDER THE REGIONAL AGRICULTURAL STRATEGY.

B. ATPP: REVIEW DECIDED THAT IN VIEW OF REVISED ROCAP STRATEGY DEEMPHASIZING AID SUPPORT OF REGIONAL INTEGRATION, PER SE, ATPP SHOULD REMAIN ON SHELF. BECAUSE OF EXTREMELY LIMITED FUNDING AVAILABILITIES, IT IS UNLIKELY THAT ATPP COULD BE AUTHORIZED EVEN IN THE EVENT A MAJOR BREAKTHROUGH SHOULD OCCUR IN THE CA INTEGRATION MOVEMENT. ACCORDINGLY, IT IS SUGGESTED THAT ROCAP ASSUME A VERY PASSIVE STANCE RE PROMOTION OF REGIONAL AGRICULTURAL TRADE INTEGRATION.

(NOTE: Page 1 only - remainder of cable deals with other issues.)

ECONOMIC ANALYSIS

1. Farm Level Impact

A. Scope: The scope of this analysis is limited to examining the impact on the small farmer of adoption of the recommendations promoted by PIADIC and CATIE in those first approximation of inputs and services needed to improve a given agricultural production process. The example used is that describing a production alternative for small farmers in the community of Samulali in Matagalpa, Nicaragua. This case study is a result of the experiences gained through field research by a team of agricultural and social scientists working under project 596-0064. 1/

In the area studied corn grown in sequence with beans is the most common production practice. Consequently, this analysis treats both crops as a unit. Individual costs and returns are aggregated and the analysis concentrates on the combined effect of undertaking the proposed production practices for corn and bean production. The procedure used takes the "with" and "without" approach, i.e., only additions to costs and returns directly associated with a small farmer's adoption of the recommended practices are considered. The assessment is based on changes to farm-level income and production as measured by simple direct farm-level crop accounts. In view of the problems associated with using increased production as an indicator of welfare for target group farmers (because of offsetting costs of inputs and varying market prices) increases to net income is given particular emphasis. Also, because of the lack of data for replicable project areas -- which would otherwise facilitate considering project impact on a regional level -- the scope of this analysis is further confined to the case study area.

B. Conclusions

The adjustments required of the small farmer to adopt the proposed recommendations are few in number, simple to execute,

1/ "Descripción de una Alternativa para el Mejoramiento del Sistema Maíz-Frijol en Relevo Practicado por Pequeños Agricultores en una Comunidad Agrícola de la Región Interior Central de Nicaragua", published by CATIE, Turrialba, Costa Rica, August, 1978.

site specific and of proven compatibility with traditional cultivation practices. To the extent corn grown is interplanted with beans is the only combination possible given the technology and resources at a small farmer's disposition, the conclusions of the economic analysis are as follows:

1) Benefits far exceed costs of adopting the proposed cultivation practices.

2) Adoption of the proposed cultivation practices required only a 3 percent increase in labor requirements.

3) Total family income increased 98 percent with adoption of the improved cultural practices.

4) Returns to investment (total income/total cost) increased over 60 percent.

5) Returns to labor input increased over 70 percent

C. Basic Data and Analytical Results

The farm-level accounts that follow trace the composition of economic factors (cost, income and production efficiency, Table 1); a comparison of factor proportions among the prevailing and proposed recommendations (Farm Budget, Table 2) and separate, more detailed worst-case treatment of cost and income considerations (tables 3 and 4).

D, Cost, Income and Production Efficiency (Table 1)

The adoption of the proposed recommendations represents significant potential increases in all income categories. Based on actual experiences with participating farmers, incomes nearly doubled in all cases. It is interesting to note the changes in the relationship between total costs and total income as a measure of efficiency. Under the prevailing system, every CA$/ha. invested resulted in CA$1.24 in gross income/ha. By comparison, adoption of the proposed recommendations returned CA$2.15 for every CA$ invested and total costs increased only 9 percent over that required for the prevailing system.

Item	Farmer's System	Alternative System	Increase
COSTS			
Manpower			
Wages/Ha (per day)	119.4	123.4	+ 3%
Plot Management (CA$Ha)	255.86	264.43	+ 3%
Inputs (CA$/Ha)			
Materials	80.95	114.03	+ 41%
Custom work	81.64	81.64	0
Total	162.59	195.67	20%
Other Costs (CA$Ha)			
Interests & depreciation	41.84	46.0	+ 10%
Returns to land	30.00	30.0	0
Total	71.84	76.0	+ 6%
Total Costs	490.29	536.1	+ 9%
INCOME			
Gross Income (CA$/Ha)			
Upper limits of range	606	1155	+ 91%
Lower limits of range	503	1071	+ 77% (*)
Net Income (CA$/Ha)			
Upper limits of range	116	619	+434%
Lower limits of range	13	535	+3611% (*)
Family Income (CA$/Ha)			
Upper limits of range	443	959	+116%
Lower limits of range	340	875	+ 98% (*)
EFFICIENCY INDEXES			
Total Income/Total Cost			
Upper limits of range	1.24	2.15	+ 73%
Lower limits of range	1.03	2.00	+ 61%
Total Returns/Wages (per day)			
Upper limits of range	5.08	9.36	+ 84%
Lower limits of range	4.21	8.68	+ 71%

(*) Ranges were obtained from farm surveys and field tests conducted at Simulali. Percentages are in relation to the upper limit of the ranges.

Farm Budget (Table 2)

Table 2 outlines physical activities of the prevailing system of corn and bean production and those required to adopt the recommended practices. An examination of the additional labor requirements, inputs, and tools required by the recommended practices would suggest that they are not beyond the capacity of interested farmers to undertake. It would appear that in a normal crop year the emphasis is to use technical assistance to effect a non-disruptive, re-adjustment of existing input levels of labor, capital and material rather than the large-scale transfer of credit and technical assistance.

E. Cost and Income Considerations (Tables 3 & 4)

From Table 3 it can be seen that under the least favorable conditions and combination of events, total costs associated with adopting the recommended practices could increase by 35 percent. It is not anticipated that all these costs will occur within one cropping cycle. The incurrence of these additional costs depends on the farmers reactions to the market price he expects to receive and the level of insect and/or disease control required in a given crop cycle. However, even with these additional costs, corn and bean yields and subsequent increases in net income, even at a 70 percent success rate, would appear to be sufficient to cover the additional outlay (price fluctuations and the timing of the outlay notwithstanding).

Table 3. Cost Indexes Comparison; Farmer's System and Recommended Alternative

	Farmer's System	Alternative System	Increase
Labor (Day wages/Ha)	119.4	123.4	+ 3%
Operating costs - inputs and contract activities (CA$/Ha)	162.59	195.67	+ 20%
Total Cost of Operation including wages (CA$/Ha)	413.45	460.1	+ 10%
Interest and Depreciation, (10% operating costs - (CA$/Ha)	41.84	46.0	+ 10%
Returns to land	30.00	30.00	+ 0%
Optional Total Costs (CA$/Ha)	0	124.1	—
Total Costs (Worst case)	490.29	660.20	+ 35%

Table 2 - Farm Budget

Activity	Labor use Man/day		Cash flow for Labor		Inputs and Tools			Inputs and Costs of Tools		Total Effective Flow	
	Farmer	Alt.	Farmer CA$	Alt. CA$	Description	Amount Farmer	Amount Altern.	Farmer CA$	Alternat. CA$	Farmer CA$	Altern. CA$
Weed cutting	11	11	23.57	23.57	Tools	—	--	--	--	23.57	23.57
Windrowing and Burning	3	3	6.43	6.43	Tools	—	—	—	—	6.43	6.43
Plowing - two times	--	—	—	—	Plow-Stick	Contract - Cont.		40.82	40.82	40.82	40.82
Rowing for Planting	—	—	--	—	Plow-Stick	Contr. - Contr.		20.41	20.41	20.41	20.41
Fertilization I	3	3	6.43	6.43	Formula	131 Kg	197 Kg	32.6	49.0	39.03	55.43
Planting of Corn	3	3	6.43	6.43	Seed	16 Kg	16 Kg	7.0	7.0	13.43	13.43
(Control soil insects)[1]	--	(2)	--	(4.29)	Insect.	--	50 Kg	--	(29.27)	--	(33.56)
(Insect control)[2]	--	(2)	--	(4.29)	Insect.	--	1 Kg	--	(9.0)	--	(13.29)
Insect control	--	(2)	—	(4.29)	Insect.	--	2 Kg	--	(5.0)	--	(9.29)
Cleaning of corn	18	18	38.57	38.57	Tools	—	--	—	--	38.57	38.57
Control "Cogollero"[3]	1.4	1.4	3.00	3.00	Insect.	1.5Kg	1.5Kg	1.25	1.0	4.25	4.00
Control "Cogollero"[4]	--	(3.0)	--	(6.43)	Insect.	—	3.0Kg	—	(18.0)	--	(24.43)
Fertilization II[5]	2	2	4.29	4.29	Urea	66Kg	49Kg	15.4	11.43	19.69	15.72
Hilling[5]	--	—	—	—	Plow-Stick	Contr.	Contr.	20.41	20.41	20.41	20.41
Fertilization III	--	2	--	4.29	Urea	--	49Kg	--	11.43	--	15.72
Cleaning for planting beans	8	8	17.14	17.14	Tools	—	--	--	--	17.14	17.14
Planting beans	12	12	25.71	25.71	Seed	65Kg	50Kg	24.7	19.0	50.41	44.71
Fertilization beans	--	2	—	4.29	Urea	--	65Kg	--	15.17	--	19.46
Suckering Corn	10	10	21.43	21.43	Tools	--	--	--	--	21.43	21.43
Insect control	--	(2)	--	(4.29)	Insect.	--	1Kg	--	(9.0)	--	(13.29)
Insect control	--	(2)	--	(4.29)	Insect.	--	2Kg	--	(5.0)	--	(9.29)
Light clearing, beans	2	2	4.29	4.29	Tools	—	--	—	--	4.29	4.29
(Fungicide I)[6]	--	(2)	--	(4.29)	Insect.	--	.68Kg	—	(2.7)	--	(7.00)
(Fungicide II)[6]	--	(2)	--	(4.29)	Insect.	--	.68Kg	--	(2.7)	--	(7.00)
(Fungicide III)[6]	--	(2)	00	(4.29)	Insect.	--	.68Kg	—	(2.7)	--	(7.00)
Harvest of Corn	9	9	19.29	19.29	Tools	--	--	--	--	19.29	19.29
Husking and Shelling	12	12	25.71	25.71	Tools	—	--	--	--	25.71	25.71
Carrying and Storing corn	6	6	12.86	12.86	Tools	--	--	--	--	12.86	12.86
Harvest of beans	6	6	12.86	12.86	Tools	--	--	--	--	12.86	12.86
Gathering of beans	4	4	8.57	8.57	Tools	--	--	--	--	8.57	8.57
Shelling beans	5	5	10.71	10.71	Tools	--	--	--	--	10.71	10.71
Cleaning grain	1.5	1.5	3.21	3.21	Tools	--	--	--	--	3.21	3.21
Carrying and Storing	2.5	2.5	5.36	5.36	Tools	--	--	--	--	5.36	5.36

1. All activities in parentheses will be carried out only if necessary and are not included in the basic budget.
2. This activity would be carried out instead of insect control had not been made.
3. The insecticide in the improved alternative is Volaton. The farmer uses Diptorex.
4. It is assumed in the alternative that 50% of severely attacked plants are considered as the critical minimum, to apply the insecticide. A minor application is maintained in order not to change the farmer's practice, but in that case no chances of significant reductions are expected.
5. Fertilization and hilling in the improved alternative are recommended at the beginning of the indicated period.
6. This practice is justified only in case of an anticipated good price for beans and of clear signs of fungi incident in beans.

Table 4. Crop Yields and Expected Income Comparison - Farmer's System and Recommended Alternative.

	Farmer's System	Alternative System	Percentage Increase
	Expected Range	Expected Range	Expected Range
Corn yield 1/ (Kg/Ha)	2000-3000	5000-6000	67%-100%
Beans yield (Kg/Ha)	500-600	850-1000	42%-67%
Gross Income (CA$/Ha)	503-606	1071-1155	77%-91%
Net Income (CA$/Ha)	13-116	535-619	361%-434%
Net Income assuming only 70% of experiment results	13-116	214-273	84%-135%
Family income 2/ according to field results	340-443	875-959	116-157%
Family income assuming only 70% of experiment results are obtained	340-443	613-554	38-63%

1/ Yield variation data for the farmer were obtained in interviews with Samulali farmers during the two experiment years. Yield data for the alternative are rounded yields obtained in experiments on the farmer's land.

2/ It is assumed that all labor utilized comes from the family.

2. Cost-Benefit Analysis

A. General Characteristics of the Project

The goals, purposes and outputs of the present project are complex in nature, consequently the resulting economic analysis is similarly complex and not completely quantifiable. The resources and the social sector to be affected are predetermined and project design has been adapted to the existing situation.

Project resources will come from AID/ROCAP, the six participating countries, CATIE, other donors, and the cooperating small farmers themselves. The proposed project is complementary to a previous project (SFCS) supported by the small sources. The project is not an isolated endeavor. Its intent is to work within existing structures and to apply the knowledge and experience of the small farmers themselves in achieving project objectives.

B. Resources

The proposed project calls for a disbursement of some $12,000,000 over about four years (excluding national contributions) and in the form of personnel, administrative and logistic services, building facilities, vehicles, land, labor, and operating capital. CATIE already has a working relationship with each country and the project will not require any reorganization of institutions. Project resources will also include land, labor and practical assistance provided by small farmers in the target areas. And other donors will make a significant contribution, mainly through technical assistance.

C. Benefits

The benefits of this project will be several. The distribution of the benefits over time and across levels of society will go beyond the duration of the project and the sector of main interest. The benefits will be both short-term and long-term in effect. The primary benefit is short-term: the improvement of production and income on small farms as a result of adoption of the tech-packs developed in the project.

The packages of information will include crops, animals, and mixed-farming (crops-animals) production systems. They will allow small farmers to increase the income generated per unit of land area by a conservatively estimated 60% above the income generated by the traditional methods.

The long-term benefits will accrue from investments in human capital and knowledge.

D. Cost-Benefit Analysis

To determine the economic feasibility of the project, a cost-benefit analysis is used. The cost is some $12 million spread over four years. The benefits (improved income and nutrition) are not so easily determinable. It is estimated that on farms that are affected by the project there will be a 60% increase in net farm income[1]. The number of farms to be affected by the project is a function of the number of the national extension agents and their efficiency. IICA[2] and CENTA[3] report that there are over 200 extension agents in the six Isthmus countries[4]. CENTA further estimates that each agent can successfully make at least 100 contacts per year, "success" meaning that significant production changes can be expected. For the purposes of this analysis the estimate of 200 agents working with 100 farmers will be used. Thus 20,000 farmers will be impacted.[5]

The per capita average annual income on farms of less than four hectares in rural Central America was $49 in 1970.[6] Assuming an average family size of six, the farm income would be $294. The increase per family farm affected is projected to be about $176.

1/ Net of costs and increased home consumption.

2/ Directorio de Extensionistas de América Latina, 2da. Edición, 1960, Alberto Franco B.

3/ A proposal for the creation of a National Center of Agricultural Technology. Ministerio de Agricultura y Ganadería, El Salvador, July 1970.

4/ These are extension agents employed by the national ministries only. In many countries, there are extension agents found in credit agencies, other government programs, and in private outreach efforts as well. Additionally, these data are somewhat dated. Knowledgeable observers suggest that the number of extension agents currently operating in the region is very substantially in excess of the number cited. On the other hand, not all available extension agents can be expected to work on this project's activities.

5/ This discounts any adoption by farmers not contacted by the agents. In reality, transfer from farmer can be reasonably anticipated.

6/ SIECA. Perspectivas para el desarrollo y la integración de la agricultura en Centroamérica. Guatemala, 1974.

Part of the increase in production will be consumed on the farm. A study by SIECA[7/] showed that caloric intake in the lowest half of the population varied from 61 to 92% of the minimum required for good health. Predictably increased production will first be used to fill the direct consumption deficit and any excess will be sold.

It is assumed that, on the average, Central American farm families benefitting from this project will increase their home consumption by one-third (from 75% to 100%). In order to include such a nutritional element in the cost-benefit analysis, it must be valued in monetary terms. For a family of six, the annual food budget for a complete diet is about $1,600; the average current level of consumption is valued at $1,200. The increase per family would be $400. The impact of this project will not, of course, be instantaneous. To reach 20,000 farmers and make the necessary changes will take several years. (In fact, most of the impact will likely occur after the project has terminated).

In order to evaluate cost and benefits over time, all dollar figures are reduced to their current value equivalent (present value). If the present value of the benefits exceeds the present value of the costs, the project may be considered economically sound.

Present value is essentially an answer to the question: how much would need to be invested now (at a given interest rate) to be worth x amount in y years? The data for this calculation are in Table 2. The interest rate used is 12%, approximately the current rate for similar projects. This analysis includes the increase in incomes only for a 10 year period. More realistically, the increase will last indefinitely and even grow due to the demostration effect. But not taking this into consideration, the cost-benefit ratio is estimated at 1:1.2. The project thus appears to be economically feasible.

There are other benefits which have not been included in this analysis such as training of national personnel, direct technical assistance to national institutions, the impact of project expenditures in the Central American Isthmus, the strengthening of national research and extension institutions, and the development of a methodology for extrapolating research results to secondary target areas. Obviously, if these benefits had been included, the result would be even more favorable. Thus this analysis shows the project to be an efficient, feasible way to increase the welfare of the rural poor in Central America.

7/ SIECA. Perpectivas para el desarrollo y la integración de la agricultura en Centroamérica. Guatemala, 1974.

Table 2. Cost-Benefit Analysis

Year	Cost		Accum. Number of adopters	Increase in Net Income	Value of Increase in Nutrition	Value of Total Benefits	
	Actual $ million	Present Value	no	Actual	Actual $ Million	Actual	Present Value
1	3.50	3.50	0	0	0	0	0
2	3.00	2.68	30	0.01	0.01	0.02	0.02
3	3.00	2.40	60	0.01	0.02	0.03	0.02
4	2.50	1.79	250	0.04	0.10	0.14	0.10
5	0	0	1,000	0.18	0.40	0.58	0.37
6	0	0	2,000	0.35	0.80	1.15	0.65
7	0	0	4.000	0.70	1.60	2.30	1.17
8	0	0	8,000	1.41	3.20	4.61	2.09
9	0	0	16,000	2,82	6.40	9.22	3.72
10	0	0	20,000	3.52	8.00	11.52	4.15
Tot.	12.00	10.37		9.04	20.53	29.57	12.29

$$\frac{B}{C} = \frac{12.29}{10.37} = 1.2$$

SOCIAL SOUNDNESS ANALYSIS

The analysis will discuss the main beneficiaries of the program, the relevance of the program to small farmer problems in the region, and describe a typical small farmer on whose farm CATIE research will be accomplished.

A. Beneficiaries

There are four major groups of beneficiaries of the project:

Small farmers, research and outreach institutions, planning agencies, and international agricultural development institutes.

1. Small Farmers. The small farmers of Central America and Panama will be the ultimate beneficiaries. 20,000 small farmers are expected to benefit directly from the project. (See Economic Analysis Annex.) Project research will be carried out, to a large extent, in small farmer areas with their active collaboration and participation. This provides an ideal means for researchers to better understand small farmers' needs, aspirations and constraints. The Technical Analysis Annex for CATIE describes the preliminary research results from the on-going SFCS project and their impact on small farmer welfare. These include:

- Corn and rice planted in association yielded more (and involved less risk) than either crop planted alone.

- Corn and squash in different combinations proved much more profitable ($451 vs. $156) than the traditional two crops of corn in succession, with an added cost of only six dollars per hectare.

- Cowpeas, when introduced into the traditional cropping systems, have yielded from 100 to 200 percent more than common beans, with equivalent nutrition, and at lower cost per product unit.

- Corn followed by common beans yielded 150 percent more corn, 60 percent more beans, and increased net income 168 percent over the farmers' system. (See Economic Analysis Annex for detailed results on this on-farm experiment.)

- In the central experiment at CATIE, a comparison of the protein production from 24 different cropping systems was made using different combinations of corn, beans, sweet potato, and cassava. The system with the highest protein production (842 kilograms per hectare per year) was beans intercropped with corn followed by corn alone. The system which produced the greatest quantity of carbohydrates was beans intercropped with cassava, in rotation with corn. This system yielded 31,240 megacalories per hectare per year. In terms of human dietary needs, these numbers suggest that one hectare per year can produce: 1) sufficient digestable energy to satisfy the annual caloric requirements

of about 15 adults (plus several head of livestock), and 2) a sufficient quantity of plant protein to meet the annual requirements of nearly 40 people.

2. Research and Outreach Institutions

Participating national and regional research and outreach institutions will benefit directly as a result of the experience gained in interdisciplinary approaches to new or improved small farm production technologies and recommendation transfer methods. The personnel of national institutions will receive field experience with CATIE staff members in their countries, and will take part in regional seminars, short courses and workshops, and annual meetings. The direct and continuing association of the national research/outreach technical personnel with the small farmer in the project will help attain greater national institutional insight into the farmers' problems and inputs into the development of methodologies adapted for their solution.

The experience with the on-going SFCS project (596-0064) suggests the likely possibility of beneficial spread effects. Several of the Central American countries have initiated their own related projects on aspects of small farmer cropping systems since the initiation of CATIE research. For example, CENTA in El Salvador not only collaborates with CATIE in the regional SFCS project but has over 25 additional trials of multiple cropping systems underway under its own responsibility. Using CATIE developed methodologies, it prepares socio-economic analyses of the crop combinations to determine those of greatest profitability. ICTA in Guatemala has research trials on about 200 different small farms where its socio-economic unit is studying the profitability of different monocropping systems. In 1978 ICTA began to work in cropping systems with CATIE and is expected to significantly expand this work in 1979. In Nicaragua, INVIERNO has entered into an agreement with INTA, the Ministry of Agriculture's research branch, to carry out on-farm research on small farmer cropping systems; CATIE is working with INTA to provide advice on the conduct of these trials and studies. And in Honduras, the Ministry of Natural Resources requested and is receiving help from CATIE in the organization of its research branch to make it more effective in work with small farmers. Recently USAID/Honduras signed an agreement with the GOH to create seven area interdisciplinary teams and a core team. These teams will be trained largely by CATIE and will utilize CATIE developed methodologies. Thus, CATIE has stimulated mutually-reinforcing spin-off activities to the benefit of both national and regional participating institutions. This is expected to significantly increase.

3. Planning Agencies

Planning agencies are constantly in need of reliable farm data such as costs of production, input requirements, yields, and

net profits for small farmers in different agricultural production zones. They also need information to substantiate the needs for infrastructural components such as roads, markets, and commodity services in rural areas. Although their national policies stress the importance of improvement of the condition of small farmers, they have lacked positive approaches and ways in which this may be attained through improvements in the production system within which small farmers are constrained. The project, from its own data sources as well as from PIADIC-derived information, will be able to provide important and relevant quantified information responsive to the needs of national planners on production methods giving a comparative advantage to small farmers.

4. International Agricultural Development Institutes

At present the principal international centers carrying on farming systems work are IITA in Africa, ICRISAT in India and IRRI in the Philippines. CATIE's project, almost uniquely among these institutions concentrates on small farmer production systems developed on small farms. It also complements the bean and cassava systems work of CIAT and interfaces with the corn breeding program of CIMMYT and the Potato Improvement Program of CIP. Especially important to these entities potentially will be the development of CATIE research extrapolation methodology. This will permit the use of Central American data and production systems in other parts of the world (and vice versa), sharply reducing the time required to acquire and disseminate new knowledge about tropical agricultural production systems and increasing the potential farmer benefits from agronomics research. Conversely, as cropping systems research continues new types of plant varieties will be required to meet the needs of this cultivation system. The international centers will be prime sources for the development of new plant varieties adapted to multiple cropping systems.

CATIE's research work will have a special effect on IICA, especially the PIADIC (Agricultural Information) project, not only because of the close working relationship between these institutions but because the CATIE research efforts will support elements of IICA's institutional and technical assistance programs in Central (and South) American countries. IICA's special PIADIC program will benefit through research data, methods of packaging data from research, publications, and the potential improvement of the transfer of information from researchers to small farmers in the more utilizable form.

The SFPS project also will help CATIE to strengthen its growing linkages to Central American countries and its research and information transfer capabilities, and will provide increased impetus for the region's countries to join in financially supporting both. It should also increase CATIE's linkage to CARDI, the Caribbean research institution.

B. Relevance to Small Farmer Problems

1. Resource Productivity

The rural poor in Central America include landless laborers, subfamily farmers, and many of the family farmers. In a 1974 SIECA study 27.7% of the rural population were classified as landless laborers, 16.6% as farmers with holdings of less than 0.7 hectares, 32.2% as farmers with subfamily holdings of from 0.7 to 4 hectares. 7.4% as farmers with subfamily holdings of from 4 to 7 hectares, and 10.5% as family farmers with holdings of 7 to 35 hectares. In this project the small farmers target group will be mostly the micro, small, and medium subfamily groupings which include more than half of the total farmers in Central America. For the purpose of this project, the term "small farm" will cover farms from 0.1 to 7 hectares in crops and up to 10 hectares for animal production. Somewhat larger farms might become beneficiaries, but the nature of the farm production systems (mixed farming with multiple cropping) is small farmer specific and will sharply limit the utility and applicability of project outputs to larger farmers. Special consideration will be given to agrarian reform areas in which holdings may run up to 20 hectares, but these are farmed by low-income small farmers.

No farming system has permanent relevance for any particular farmer. Each farmer has to choose, usually within a relatively short time frame, what he is going to do in the near future to satisfy his short-term needs and advance his long-term goals. The project will consider both the constraints on and the ambitions of the target group and will help design a variety of systems which can provide alternatives for the varying needs of small farmers.

Small farmer welfare improvement results from increases in both cash and "in kind" (subsistence) income as well as through improvements in the health of his family resulting from improved nutrition. In 1974 SIECA reported that in Central America the average annual cash income for the group of farmers with 4 hectares or less was $49 and for the group with 4 to 35 hectares it was $172. A key justification of this project is to provide a research base to improve small farmer productivity from limited land and labor resources, either from increased total yield or increased net income from the production components (or a combination of the two). The project explores and evaluates both. The improvement of "in kind" income involves research methodologies directed toward production for direct consumption by the small farmer's family. His farm system reflects the degree to which the farmer is bound to subsistence farming. Generally the smaller the land unit, the more closely it is constrained to subsistence production. To relieve the family of the cost of purchased food products is the equivalent

of cash income. And improving production of foods to the extent that some of the product may be sold provides cash income as well as improved family subsistence.

2. Nutrition

INCAP's studies of nutrition among rural families in Central America have demonstrated the marginal levels of carbohydrate and protein nutrition of the lower income group within the rural poor. The project will incorporate into multiple cropping and mixed-farming systems those crops and animals that provide more nearly adequate and balanced nutrition sources, e.g. cowpeas. Cowpeas yield more than common beans in the humid lowland tropics and are acceptable to the region's rural populace as a dietary substitute for common beans (as has been demonstrated in El Salvador and Honduras). Research has shown that cowpeas fit well into cropping systems and are nutritionally preferable to common beans. Similar examples can be shown for other crop and animal combinations.

3. Employment

Unemployment in rural Central America is one of the region's most pressing socio-economic problems. The agricultural labor force is growing at a rate approximating the population growth rate (i.e. some 3 percent per year). Thus, the agricultural sector, and primarily the small farm sector, must create literally millions of productive jobs within the next 20 years. A key element of this project is the creation of employment opportunities in small farm agriculture through a new systems approach.

In most of rural Central America, unemployment and underemployment are seasonal. In El Salvador, for example, plantation farming of three export products (cotton, coffee, and sugar cane) provides employment for landless and subfamily farm laborers from 4 to 5 months of the year (including employment for women and children during this period). The small farmer with a subfamily-sized farm adjusts his farming system to this seasonal demand for labor to the extent that he can. By providing alternative technologies which can improve the productivity of his land and labor, and increase his farming income, the project will help to reduce rural unemployment/underemployment as well as fluctuations in labor demand. And increased land and labor productivity will benefit not only the small farmer's family but also the landless rural poor who depend more on daily wages for their living.

4. Risk Reduction

The traditional farming systems of small farmers in Central America have developed under the necessity for low risk, and this constraint is important in determining the feasibility of changes in system components or in management. Mixed farming of crops and animals, combinations of perennial and annual crops,

intercropping, and relay planting of annual crops are systems which can provide maximum productivity from the limited land resources of the small farmer while minimizing potential jeopardy. The project will develop and test methodologies for the selection of farming systems components entailing minimal risk. It will provide the small farmer an opportunity to take new initiatives to improve his income, at minimal risk, through the selection of crop and animal components and management systems that are complementary in the use of land, capital, and labor, and are tolerant of wider ranges in the limitations of weather, insects, and diseases.

5. Conservation

Conservation of the water and soil resources of small farmers is of long-term importance. Yet, because of the pressure for subsistence and cash income, small farm land resources often are misused by over-grazing or by ultimately destructive cropping systems or practices. Over the past twenty years, for instance, the region around San Isidro de El General in southern Costa Rica has been deforested and is now occupied by medium and small farms. The land is generally unfertile and physically unstable so that, when exposed to torrential rains (which occur perennially), there is serious erosion and slippage. Improper land use practices here have resulted in permanent loss of soil and waste of surface water on at least half of the area. This project will address resource protection through the development of technical information packages for stable farming systems with management guidance for soil and water conservation.

6. Sociocultural Feasibility

A key element of the on-going CATIE research has been the development of an approach incorporating the sociocultural environment of the Central American small farmer. The research process starting point is to comprehend, as completely as possible, the why, how, when and where questions regarding the reasons for the current production systems, how they work, and the full socio-economic environment of the particular small farmers engaged in them. In addition, the CATIE research into transfer mechanisms will include a specific examination of the relationships between small farmers and the respective transfer system. This has particular relevance to the purposeful selection of different transfer mechanisms (e.g., coops, seed distributors, money lenders, extension agents, etc.) and an examination of how they relate to the small farmer's environment and how both the small farmer and the respective transfer agent view themselves, their place in the local economic scene, and each other. With this knowledge CATIE researchers seek to assist the small farmers in accelerating the natural evolution toward improvement in his system.

For the small farmer beneficiaries this project will expand on the successful approach of the on-going research and is, therefore, likely to be highly compatible with the socio-cultural environments of the region's small farmers.

For the national institution beneficiaries, the approach to be utilized by this project has likewise been proven compatible with the general sociocultural environment of the region. The project will bring new elements of mixed farming, animal farming extrapolation, and information utilization thus enlarging the approach within the same framework used on the on-going CATIE research. This approach has proven effective and compatible with the region's institutional environment thus there is reason to believe that the same approach will continue to become increasingly effective in this project.

7. Diffusion of Innovations

One of the important components of this project is research transfer and utilization. Emphasis will be placed on utilization rather than mere transfer which may not promote utilization.

This will represent a significant new dimension to CATIE's small farm production systems work. It is a logical step and one that is essential to the application of knowledge generated by the project's research efforts. But because this component has not been an integral part of previous related activities, there is little experience upon which to base a prediction of the sociocultural impact of the planned diffusion effort.

The planned methodology to be employed in developing the research transfer and utilization component has been drawn from the most relevant experience to date. However, the ultimate success of this effort is dependent not only on the effectiveness of transfer techniques developed by the project but also on the will and capabilities of national outreach institutions. To the extent that these agencies can be strengthened in diffusing new knowledge, the project will be successful.

C. Typical Small Farmer

The attached case study summary was prepared by CATIE as part of their research into small farming systems currently in use in Central America. It provides an excellent overview of the target group.

DON VICTOR: A SMALL FARMER IN COSTA RICA

Summary of a case study

Introduction

Considering the important role that low-income farmers play in the agricultural economy of the Central American Isthmus, there is now some concern to improve more rationally their economic and social situation. CATIE, very much aware of this trend, has been developing a methodology to identify or develop cropping systems, technically improved, adapted and adoptable, which can help to improve the lot of those farmers. This means that the efforts being made should improve earlier attempts which tried the simple transference of technologies that were developed in experimental stations and that considered only technical factors to be used in a social vacuum.

The cropping systems that are traditionally utilized by low-income farmers in the Central American Isthmus show a clear adaptation to the physical-biological and socio-economic conditions of the environment in which those farmers operate. Undoubtedly, those systems are the result of a selective and evolutionary process that has permited their adaptation and approximation to a dynamic equilibrium with the environment in which they prosper (4, 6, 9). These observations suggest that the identification or generation of improved, adapted and possibly adoptable cropping systems should be based on previous knowledge of the environmental conditions under which those systems are expected to prosper. This is one of the most important aspects of the methodology being utilized in the Cropping Systems Project of CATIE (7).

The previous knowledge that is obtained from the environment in which the small farmers operate make it possible: a) to orient research and required studies to find the necessary improvements for production systems; b) to identify the restrictions to the research results; c) to find the bases for evaluating results; and d) to give adequate direction later to the diffusion process, or production programs (6, 8).

An examination of the environment in which the cropping systems prosper implies a study of the physical-biological and socio-economical factors, both within (endogenous) as well as outside (exogenous) the farm.

The study of physical-biological factors has been generally governed by traditional agricultural research. The consideration of human elements (socio-economical factors) is, however, recent in efforts of this type, and its methodology is in a state of evolution (2, 4, 5, 6, 7).

CATIE's project in small farm-cropping systems is studying the environment of the small farmers by periodic visits to their communities, statical and dynamic surveys including some special studies of individual families (case study).

Case study

A case study consists of selecting a family, among those that have offered to cooperate in the area being studied, and visiting it periodically for informal interviews during the agricultural year. The information acquired during the interviews is complemented with the use of farm records showing daily activities.

The records have been oriented, in most cases, towards production aspects and endeavor to reflect the activities of the family group living on the farm, including the use of inputs and sale of products. The keeping of records has been done by one member of the family, which has made it possible to obtain information with respect to the family's consumption habits.

The case studies are based on the following supposition: the study of the activities of the farmer and his family, for one agricultural year, gives the observers an opportunity to envision the situation in a manner closer to the way the farmer faces it. This, in turn, makes it possible to evaluate the farmer's activities and the decisions he takes in a more adequate way, and thereby learn something from the exercise.

The small size of the "sample" (a family living in the community) is considered to be partly compensated by the intensity of the observations during the year. The representativeness of the selected families is determined in previous visits to the community by program technicians who choose a family among those wishing to cooperate.

In Costa Rica, three case studies have been carried out. One family was chosen to represent the more traditional small farmer, in accordance with his technology and production of basic grains, which served only partly for subsistence, since he sells more than fifty per cent of his production. The second family represents those small farmers whose technology is more up-to-date, utilizing more modern inputs and inclined towards vegetable production. The third family represents those progressive small farmers inclined towards producing commercial crops such as coffee and sugarcane.

This paper by Dr. Luis A. Navarro, Agricultural Economist, refers to the case study made of the most traditional farmer. Some of the most important aspects of the case are summarized here. A preliminary report has already been published (reference No. 7) and is available in Spanish to those persons interested in obtaining a copy by writing to Ing. Humberto Jiménez, Specialist in Communication, CATIE, Turrialba, Costa Rica.

The family and its resources

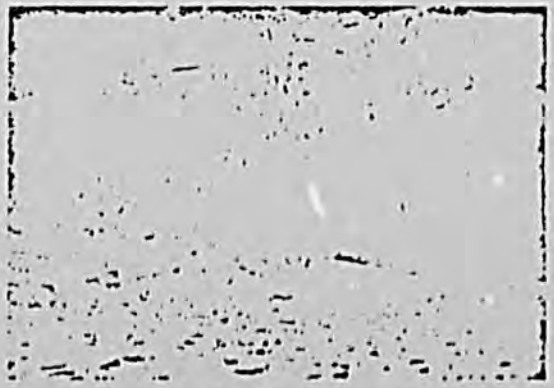
Don Víctor (52 years old) and his wife Teresita (47 years old) have 12 children, of whom 10 live with the family, made up of 16 persons. The permanent family labor staff consists of don Víctor, three sons over 12 years of age and a son-in-law. The rest of the family works with less intensity in the farm activities dealing directly with production.

The farm covers 13.5 hectares, 62 per cent of which is devoted to annual crops, 31 per cent to natural pasture, 4 per cent to coffee and 3 per cent to

The hut in the background is don Victor's storehouse. Although built in the traditional style, it is very efficient for storing grains.

buildings and idle land. The few forest and fruit trees found on the farm are limited to the fence rows or associated with the coffee. Eighty-two per cent of the farm is on land with a 10 to 45 per cent slope, which is not favorable to intensive agriculture, especially when one considers that the original soil material is saprolitic, derived from sedimentary mud rock, which is completely unweathered. This means that the problem of erosion and landslides is critical, and is aggravated even more due to the high rainfall intensity in the area. The chemical characteristics of the soil are not so unfavorable (although the fertility has decreased), which can explain, in part, the low level of fertilizer use. In 1976, US$12 were spent on this input.

Based on the rainfall data for San Isidro de El General, a distance of 40 km from the farm, the



Eighty-two percent of don Victor's farm has sloping land not suitable to intensive agriculture.

20-year average comes to a maximum of 587 mm in October and a minimum of 15 mm in February; the annual average being 2944 mm (Fig. 5). From the agricultural point of view, the rainfall distribution can be considered as if it were bimodal, which gives rise to the existence of two cropping periods, the "primera" or "invernis" which begins in April-May and the "postrera" which begins in August-September. The canicula, a relatively dry period in July-August, makes it possible to harvest the crops of the "primera" and to plant those of the "postrera".

Farm activities are determined mainly by rainfall distribution (availability of water) and also by the coffee picking season, which begins at the end of September in the area and implies competition for labor, including that of the family.

Cropping systems

Farm production destined for market or consumption is based mainly on annual crops and coffee. The main annual crops are basic grains such as maize, beans and rice.

Maize and beans are planted in both cropping periods. Bean management and technology is more intense in the "primera", which is the least favorable for this crop as far as climate is concerned, but more favorable with respect to the availability of labor. Beans in the "postrera" are cultivated as "frijol tapado", a traditional technique, using a minimum of labor. It consists of broadcasting the seeds on land that has been "resting" and which is therefore covered with high weeds. Then the weeds are cut flush to ground level and cover ("tapado") the beans. The next job is to harvest the beans.

Rice is planted during the "postrera", although the most adequate period would be in the "primera". The main reason for not doing it in the "primera" is the scarcity of alternate food crops in this period for the wild birds, implying a great risk for the planting; something that does not occur in the "postrera".

Coffee picking activities are concentrated in the last part of the year. This means that the family labor, at this time, should be free of activities dealing with the annual crops on the farm, to pick their own coffee and also to go out to pick coffee in other farms, and thus increase the influx of needed cash.

Other crops such as cassava (*Manihot esculentum*), pigeon pea (*Cajanus cajan*), tanier (*Xanthosoma* sp.), squash (*Cucurbita moschata* and *Cucurbita maxima*), and cucumber (*Cucumis sativus*), are grown in small quantities and only for family consumption. Fruit production is minimal and mainly for family use also. Occasionally avocados and oranges are sold, depending on the time of the year they come into production.

The technology used on the farm can be described as traditional, tending to reduce the use of modern inputs, with almost all the work done manually. During the year 1976, the family obtained a knapsack sprayer to apply herbicides for use mainly in the pastures and in the rice fields, under the direction of local suppliers of this input. Other inputs included a little fertilizer for the corn; bait to control terrestrial slugs, which are one of the outstanding biotic problems that exist on the farm, especially in beans; and aldrin for treating seeds.

Land is prepared without breaking the soil, just by scraping and burning crop residues, or leaving them as mulch in the case of maize, which does not suffer from slug attacks.

The sowing of crops is done manually with the help of dibbles ("espeques" or "macanas"), and plant densities are generally low. All the crop "varieties" can be considered as local; weed control is also manual.

The most common cropping systems are: 1) beans planted between rows of maize 6 meters apart, both planted in "primera" and rice planted in "postrera" between the bent over maize of the "primera"; 2) beans planted between rows of maize 6 meters apart, both planted in "primera" and maize planted in "postrera" between the bent over maize of the "primera"; 3) maize planted in "primera" followed by maize planted in "postrera" between the bent over maize of the "primera"; 4) "frijol tapado" broadcast in the "postrera" on land that has been "resting" for at least the first part of the year; 5) maize planted in the "primera" followed by rice planted in the "postrera" between the bent over maize of the "primera".

The management of these systems consists of working small tracts of land. Only in one case did the farmer plant more than one hectare at one time. Every agricultural practice is completely finished in each plot before going to the next in order to permit an adequate control of weeds considering the total land cultivated and the availability of labor. In 1976, there were 12 plots of land, varying in size from 0.18 to 1.05 Ha, managed independently in the first planting period and 19 portions, varying in size from 0.04 to 1.05 Ha, identified as being differently managed in the second part of the year.

The value of the production from the annual crops for the year 1976 was US$1,750 of which 52 per cent was sold, demonstrating that the function of these crops is not only for marketing, but also for subsistence.

Livestock

The livestock management is quite extensive, especially with respect to cattle. The five hectares of poor pasture are stocked with three cows, three heifers, two smaller animals and a horse. The most important care consisted in looking after the cows and controlling parasitic insects such as "torsalo" *(Dermatobia hominis)*. During the dry season, when the pastures can not sustain the stocking rate, they manage the animals by letting them graze alternately on the crop residues and in the pastures. This benefits both the cattle and the land to be cultivated, since the trampling breaks up the residues and the animals "control" the weed growth, which means a saving of labor at the time of preparing the land for the following harvest period.

The hogs (8 of various ages) and chickens (90 of various ages) are cared for by the housewife. The pig-pen is maintained perhaps too close to the house. The hogs and chickens are fed concentrates and part of the basic grains produced on the farm. In 1976, the family spent US$179 on concentrates for these animals.

The economic efficiency of the livestock operation is clearly inferior to that of the annual crops and coffee on the farm. This alone is reflected in the fact that the objective function of the livestock is not exactly economic, but rather social; providing subsistence, security and a way to invest. In fact, the livestock was partially subsidized by other activities on the farm.

The poultry was raised mainly for meat and eggs. There were sporadic sales when there was an excess over what was needed for the usual consumption (1–2 chickens and 10 to 15 eggs weekly), or in minor emergencies. The hogs come closer to being a commercial operation, besides being considered as an asset which can easily be converted into cash in case of major emergencies. The cows are raised only partially for their milk, and for the time being, as means of savings and major investment. They are sold (which is considered a true "sacrifice") only in case of serious emergencies, and can be used also as guarantee, should there be a need for requesting credit. In general the family resists getting credit for production, and only considers it necessary for investments in land or for buying more animals. Faced with the need for cash to produce, the preference is to go off the farm to find work, in which case don Víctor usually utilizes his skill as a carpenter.

Forestry aspects

The forestry aspects are not to be considered as a business operation, but rather as an operation complementary to the others. The trees are used for fences or firewood, and occasionally to make charcoal to be sold. Due to the characteristcs of slope and type of soil of the land resource, this operation should be more important; the same for perennial crops.

Farm-environment relationship

Don Víctor's farm is located 4 km from Pejibaye, a populated center with 400 persons, in the district bearing the same name in the canton of Pérez Zeledón, San José province, Costa Rica. The district covers 7245 Ha, with 854 agricultural operations and a population of 8000 (3).

Pejibaye is the main market to purchase inputs, food and products needed on the farm.

The market for inputs and food supplies consists of three grocery stores and shops, besides a commissary belonging to the National Production Council ("CNP"), a governmental entity. The market, mainly for basic grains, is in private businesses, which act as middlemen between the farmer and the "CNP". The coffee is sold by the farmers directly to the processors through collecting terminals established in the community.

The family has to travel to San Isidro de El General, a city 40 km away, to buy clothes, for medical care or dental work. Pejibaye offers limited medical service, only in the case of emergencies. The existing roads leading to the farm are passable year round.

Whatever additional labor, other than that of the family, comes from the community.

The following diagrams - figures 1-4- show the flow of cash as income, as expenditures, and the use of labor, as observed during 1976 and part of 1977.

Other observations and comments

The data included in this report are only preliminary, and are based on observations made between April 23, 1976, and January 23, 1977.

The economic movement of the farm during the year is one of the most interesting among the observations. These observations are summarized in Table 1.

The opportunity costs utilized in Table 1 are in agreement with the possibilities existing in the area during the study. The daily wage paid for family labor was quoted at US$2.34, and the yearly cost of land use at US$50.20 per hectare. The results in the table show that only 17 per cent of all costs are in cash, which implies a relatively intensive use of the land and labor resources.

The same results show that 54 per cent of the production was sold, and 46 per cent for consumption or storage for later sales. Finally, the index of economic efficiency (1.28) indicates an attractive net return of 28 per cent on total investment, although at the time of the analysis, the family had received an advance of only 75 per cent of the final value of the coffee picked during that season.

The indices undoubtedly indicate a high efficiency for the farm's activities during the period. The figures reconfirm, at the same time, the low intensity of technology as far as the use of capital, and the high intensity with respect to the use of the farmer's own resources, especially family labor which, although modestly evaluated, comes to 50 per cent of all the costs. If it were necessary to identify the most limiting factor, without a doubt, it would be capital, especially in the form of an adequate flow of cash.

Although the efficiency of farm production is good, the low use of capital implies that the volume or absolute levels of income are very low in relation to the land resources and family size. This means that the family lives in quite a tight situation for getting the means to survive and conserve its means of production.

The major limitation for the family constitutes the availability of cash. During the observation period, they received US$2,191 in cash; 82 per cent came from farm production, 7 per cent from the family working off the farm, and 11 per cent from an extraordinary income, thanks to an inheritance. Of this money, US$2,133 was spent in the following manner: 47 per cent on consumer's goods (food, household articles, medical care), 20 per cent on farm operating costs, and 33 per cent on investments. The

Table No. 1. Monetary values for the different components of receipts and expenditures made by don Víctor on his farm, as a production system between April, 1976, and January, 1977.

ITEM	US$ Total	US$ per Ha
EVALUATION OF INPUTS (Cost)		
Labor		
Cash payments	171	13
Total (includes family labor)	1480	110
Materials		
Cash payments	235	17
Total (includes use of own seeds)	303	22
Other costs (Opportunity costs)		
Payments made in cash for the period	12	0.9
Total	837	62
Total Costs		
In cash	418	31
Total	2620	194
EVALUATION OF OUTPUTS (Income)		
In cash (sales)	1800	133
Total (value of total production)	3343	248
Returns or net income		
In cash (considers only cash and cash income)	1382	102
Total	723	54

investments, however, include payment of the debt on the land, purchase of animal and production materials, but not the improvement of resources.

The remainder of the cash, when the study was terminated, about US$60, besides the rest of the payments on the coffee, would be the money available for consumption and production activities on the farm between February and July. This is too austere, and the members of the family will have to go off the farm to work, besides resorting mainly to the sale of hogs.

This limit of cash in relation to family needs makes it impossible to consider conserving or improving resources, especially the land. The latter implies that farmers, such as the one studied, are consuming their resources, which, on a long term basis signifies a total deterioration of resources, and a collapse of the farm, even as a means of simple subsistence. This is a social problem inasmuch as the resources, although possessed and managed by the farmer, are also society's resources, and their deterioration should be the concern of everybody, especially the government.

Interviews with the farmer being studied, and others similar to him, show that they are conscious of what is happening, and in effect the management of their farms reflects this concern. Their soil preparation and cultural practices in general, show a minimum amount of tillage, which decreases the deterioration rate of their resources, especially when one considers their quality. Besides, these practices are in accordance with the scarcity of capital and labor.

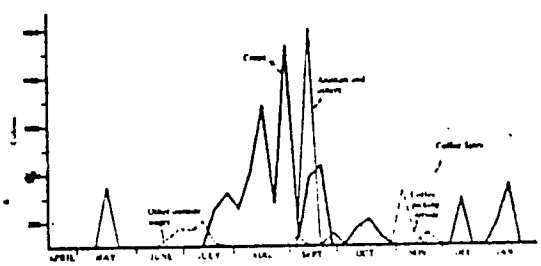


Fig. 1. Weekly flow of cash income from different sources. (Don Victor, case study, 1976–1977)

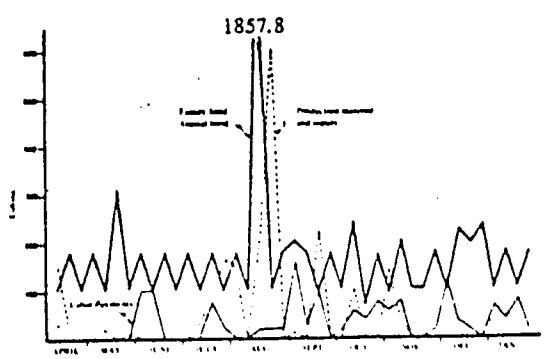


Fig. 2. Weekly flow of different types of cash expenditures. (Don Victor, case study, 1976–1977)

Those technological aspects, plus the minimum dependence on modern inputs, are, at the same time, a source of learning for the technicians concerned with finding adequate low-cost and independent inputs derived from petroleum technologies for food production.

Any attempt to solve the problem of compensation and conservation of natural resources at the small farmers' level, as the one observed, implies a cost that the farmers can not afford without help. It is society's responsibility and concern to think in terms of long term solutions in contrast to the actions of the farmer which may be, by necessity, short term solutions. At the same time the existing

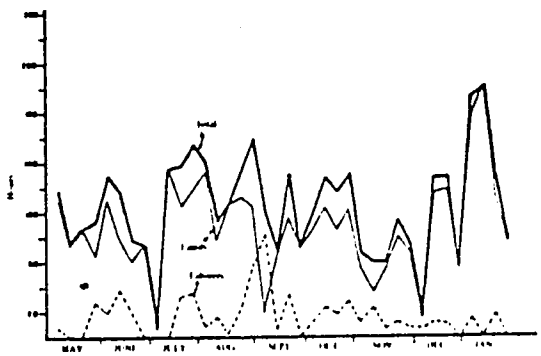


Fig. 3. Number of hours worked by family and laborers each week on the farm. (Don Victor, case study, 1976–1977)

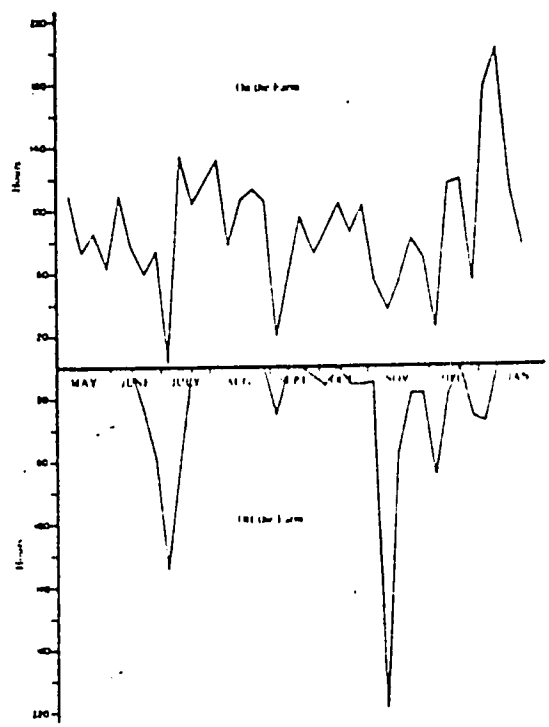


Fig. 4. Number of hours per week worked by the family on and off the farm. (Don Victor, case study, 1976–1977)

conflict should be considered by most technicians and planners, who in all their eagerness for developing technologies, are looking only for an immediate increase in food production. On the contrary, the attempt should be to attain better production that provides more income, at less cost, in a continuous way over the years, considering the limitation of existing resources and their possible deterioration. Possibilities for this kind of approach are, partly, in appropriate research, well directed technical assistance and credit programs which consider the actual constraints of clients.

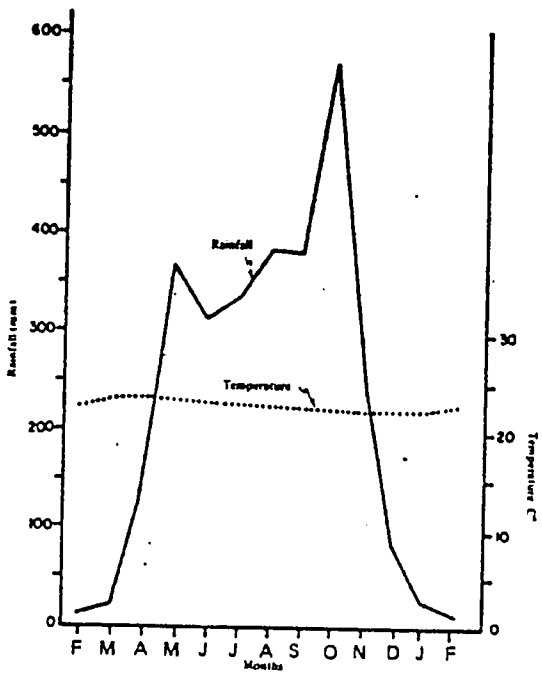


Fig. 5. Monthly climatic parameters based on 20 years of data. San Isidro de El General, Costa Rica.

Altitude: 202 meters above sea level; 10°1'N Lat; 84°4' Long; average annual rainfall: 2944 mm; average annual temperature: 22.8°C

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Continued from page 2

management of food crops in the eastern Amazon region.

Later in 1975, he served as a research associate in the Department of Agronomy of Cornell University, helping with a collaborative program at the Soil Research Institute in Kumasi, Ghana.

In 1976, he received a postdoctoral appointment at Cornell to prepare a literature review on polycultural farming systems. He worked briefly with the Federal Grain Inspection Service of the United States Department of Agriculture and with the Benchmark Soils Project in Minas Gerais, Brazil.

Kass joined the CATIE staff in late December of 1977. He will serve as resident specialist with the Institute of Agricultural Science and Technology (ICTA) in Guatemala as part of the CATIE–ROCAP cropping systems project.

Héctor Hugo Li Pun (Peru) was awarded the degree of "Ingeniero Zootecnista" in 1971 from the National Agrarian University, La Molina, in Peru. From 1970 to 1975, he studied at the University of Wisconsin in Madison, Wisconsin, where he received his M.S. degree in 1973 and Ph.D. in 1975 in Animal Nutrition – Animal Production and Biochemistry.

He worked as a research assistant in the Ruminant Nutrition Laboratory of the Dairy Science Department at the University of Wisconsin from 1973 to 1975. Upon his return to Peru, he was employed from 1975 to January of 1978 by the Nutrition Department of the National Agrarian University, La Molina. He was in charge of teaching the graduate course in Nutritional Biochemistry and Ruminant Nutrition and was research coordinator of the nutrition work. He took part in the research and administration of the programs on meat and milk production, and cattle breeding of said institution.

He also worked as a consultant in the concentrates and poultry industries in Peru.

Li has written papers on ruminant and poultry nutrition.

On January 19, 1978, he joined the CATIE staff as advisor in animal production to work in David, Panama, with the IDIAP-CATIE-IICA Contract.

TECHNICAL ANALYSIS - IICA/PIADIC
(Project 596-0048)

This Annex complements the description of PIADIC activities contained in the body of the PP. It provides the work program for the area sample frame activity, the PIADIC approach in production of area specific profiles, the relationship of the PIADIC methodologies to the AID/W funded Comprehensive Resources Inventory Evaluation System (CRIES), a description of a PIADIC small farmer first approximation research design, the work program for its application, and, finally, the PIADIC program described within the context of the "Iowa Model" of agricultural research and information systems development.

I. PROGRAM OF WORK FOR AGRICULTURAL/RURAL SECTOR STATISTICS -- AREA SAMPLE FRAME

COSTA RICA: Cooperating Agencies - GOCR
- a. Dirección General de Estadísticas y Censos
- b. Oficina de Planificación Sectorial Agrícola
- c. National Coordinating Committee

Activities and Time Frame

A. Present Courses in:
1. Data Use by Planners - 1979
2. Crop forecasting - 1980
3. Interviewing and Supervising Techniques 1979-1981
4. Basic Sampling Theory and Frame Construction - 1980

B. Provide technical assistance to national coordinating Information System - every month during 1979, every two months in '80 and '81.

C. Work with national survey system to establish priority of data needs and survey calendar and to coordinate sector systems - every month during '79, every two months '80 and '81.

D. Provide technical assistance to DGEC in continuing development and utilization of area sampling frame. Once a month during 79, every two months '80 and '81.

E. Recommend individuals for training outside Central America. Every year.

EL SALVADOR: Cooperating Agencies
- a. Dirección General de Economía Agrícola
- b. Instituto Regulador de Abastecimientos

Activities and Time Frame

A. Present Courses in:
   1. Data Use by Planners - 1980
   2. Interviewing and Supervising Techniques - 1979

B. Assist with establishment of Crop Forecasting System - every two months.

C. Advice DGEA-MAG in the process of refining survey procedures - every two months.

D. Coordinate technical assistance in data processing and mathematical analysis - every two months.

E. Provide technical assistance in improvement and new applications of the area frame - every two months.

F. Recommend individuals for training outside Central America - every year.

GUATEMALA: Cooperating Agencies
   a. Unidad Sectorial de Planificación Agrícola
   b. Dirección General de Estadísticas y Censos
   c. Instituto de Comercialización agrícola

Activities and Time Frame

A. Present Courses in:
   1. Data Use by planners - 1979
   2. Interviewing and supervising Techniques - 1979

B. Work with national committee in the establishment of a coordinated data collection system - every month 1979.

C. Coordinate technical assistance in the development and application of the area frame - every two months.

E. Recommend individuals for training outside Central America - every year.

HONDURAS: Cooperating Agencies
   a. Ministerio de Recursos Naturales
   b. Dirección General de Estadísticas y Censos

Activities and Time Frame

A. Present Courses in:
   a. Data use by planners - 1979
   b. Interviewing and Supervising Techniques - 1980

B. Coordinate and provide technical assistance in the construction of an area frame and the conduct of a pilot survey in the departments of Valle and Choluteca - every month 1979.

C. Assist with expansion of area frame beyond pilot area - every month 1980, every two months 1981.

D. Recommend individuals for training outside Central America - every year.

NICARAGUA: Cooperating Agencies:
a. Oficina Ejecutiva de Encuestas y Censos
b. Dirección de Planificación Sectorial Agrícola
c. Instituto de Comercialización Exterior e Interior

Activities and Time Frame

A. Present course in:
1. Basic sampling and frame construction - 1980
2. Data use by planners - 1980
3. Crop forecasting - 1981

B. Assist with establishment of information system in DIPSA - every two months '80 and '81.

C. Provide technical assistance in the application and refinement of area frame procedures - every month 1980, every two months 1981.

D. Recommend individuals for training - every year.

PANAMA: Cooperating Agencies:
1. Dirección de Estadísticas y Censos
2. Contraloría de la República
3. Ministerio de Desarrollo Agrícola

Activities and Time Frame

A. Present course in data use by planners - 1980

B. Assist in development of integrated project for national information system - every two months 1979.

C. Provide technical assistance in improving survey field procedures - every month 1980.

D. Work with DEC in the modification and improvement of their area frame - every month 1981.

E. Coordinate technical assistance to establish computer survey processing in Contraloría every two months 1979.

F. Recommend individuals for training - every year.

REGIONAL: Cooperating Agency:
Secretaría de Integración Económica Centroamericana

Activities and Time Frame

Work with SIECA in promoting a coordinated crop reporting system in Central America based on the use of similar methods. Every three months 1979 and 80, every month 1981.

II. DATA BASES DEVELOPMENT AND USE

A. Approach

Key Agencies

Sector Planning Office
Agricultural Statistic and Census
Agricultural Research
Agricultural Extension - Home Economist
Major - Ag - Business Services organizations that serve small farmers
National Universities

The following are major activities planned:

1. PIADIC staff will review appropriate state of the arts literature and available information on current methodologies.

2. PIADIC staff will assist National Committee to identify key agencies and individuals and mobilize task force to focus on this area of work, review available information and assist in data bases development refinement and use. Efforts will be made to establish forum with small farmers/wives and to get their assistance in selecting priorities and procedures useful for making recommendations to be tested.

3. PIADIC staff will provide orientation and training in understanding the need for small farmer area specific profiles; identifying and selecting priorities and methodologies for specific areas to determine level and use of production technology, the present knowledge of small farmers and their attitudes and customs.

4. PIADIC will assist in preparing terms of reference of the work to be done, in designing surveys, in developing and training survey teams and in testing questionnaires with the collaboration of agencies using area frame where available and appropriate, or with other agencies or contractors that have been contracted to perform these services.

5. PIADIC staff will assist National agencies or contractors to process, analyze, interprete and summarize survey results, including:

a. Major small farmer problems
b. Present level of small farm practices

c. Present small farmer knowledge of other practices being used and level of knowledge about additional alternatives.
d. Why additional inputs are not being used (not available, cannot afford them, do not understand them, afraid of them, is not the custom to use them, etc.).
e. Possible appropriate alternatives.

6. PIADIC staff will assist National agencies/contractors to transfer summarized findings to national and regional agencies that have the capability and responsibility to test, modify and verify the appropriateness of possible additional inputs.

7. PIADIC staff will advise and assist National agencies to obtain information about research that has been tried/tested and verified as appropriate for a specific location, or set of conditions. This information will be built into specific small farmer profiles and used for first approximation farmer recommendation development.

B. RELATIONSHIP TO CRIES

The Comprehensive Resources Inventory Evaluation System (CRIES) is an AID/W approved statistical activity utilized US Bureau of Census assistance. In some respects it is similar to PIADIC activities. A brief explanation of the similarities, differeces, and compatibilities are outlined below.

(1) Similarities

Both PIADIC and CRIES seek data bases that include an inventory by site location. In each of these data management systems, the construction of an index of known factors at a given coordinate depends upon several common data sources within the country. Each program seeks, using different time frames, to be able to recall "stored" information by site, index factor, time, or other data point within a given frame.

(2) Differences

The PIADIC project provides technical assistance in information management. This by definition includes numerical data bases and documentation centers. Its design is to increase the quality and quantity of data now being produced. Methodologies are provided for generation, storage, analysis, recall, and adaptation of numerical and documentated information. The area frame methodology will allow rapid surveys for production (crop forecasting) information or socio economic studies as needed.

The eventual electronic "marriage" of these sources and their data by location, time, value or commodity are among the project goals. A wide variety of clients are seen as direct users.

CRIES is a USDA methodology now being implemented in Nicaragua and under discussion in Costa Rica, using AID/W support. This data management system uses an analytical frame work index of one time known factors on a grid and coordinate basis. It allows linear programming models to be run for production, supply potential land use and other areas of interest for the planner's value judgments. The major users of this system are planners and CRIES provides them with a data base and programming tool. The value, however, of the system depends heavily upon original input quality. Up-date capabilities remain dependent on other data bases.

3. Compatibility

Obvious areas of compatibility are found between the two projects. Much effort has been directed by PIADIC towards the offices of Agricultural Planning in each country. Laws have been passed allowing the creation of national agriculture information systems, setting up the first steps towards common coding of data, etc. In the final stages of each project considerable computer capacity is needed. This could be the same machine.

The possible use of a CRIES matrix to integrate data and information is under study by PIADIC. The efforts of CRIES and PIADIC at the country level in calling attention to common data needs, similar coding, model uses, is seen as supportive to each other and local agency on-going programs.

C. Description of PIADIC Small Farmer First Approximation Recommendation

In each country, PIADIC is assisting in the preparation of first approximation research recommendations. Some 23 USAID assisted projects call for the development of such documents in Central America. These are according, commonly called tech parks; however, significant differences exist among the various approaches in thus field. Nomenclature notwithstanding, definitions are in order to distinguish how PIADIC methodology relates to 1) Farmer recommendation packages, 2) State-of-the-arts reports or 3) A package of technology. PIADIC methodology aims at a complete package research design ready to go to the field for testing, based upon the best available information for a given crop, in a specific area, at that time. It will not, in most cases, be a "farmer recommendation" ready for implementation. It is thought of as more complete than a State of the Arts Report, and designed for an investigator not a farmer client. After sufficient trials it may become a package of technology ready for dissemination.

These research designs may also be known as "teck packs" or "Best Bet Teck Packs". Time lag is cut down by using known data to determine the field design for site specific problems. This methodology also provides excellent feedback to information and data producers in terms of quantity and quality of their product.

PIADIC's role in this process is, oversimplified, the following:

1) A methodology consisting of selection or construction of small farmer area profiles providing information on climatic conditions data, socio-economic data, and biological knowns, is used. These data, if available, are selected by site (geographic) and are crop specific.

2) This methodology is offered to each collaborating country in determining the best combination of known factors to develop a first approximation Field Design. Technicians participating in this exercise are selected from investigation, extension and planning units.

In most countries, the wide range of information needed is available only on mono crops. The exercise forces the location of this material and helps, form it into a first (preliminary) approximation. The important priorities are where is the farmer at in terms of location and his present state of art in production. The effort is then made to focus upon a program for farmers' in that area. (To a certain degree, this work is related to information required by CATIE in the reach for repliable production areas for analog research; however, CATIE requirements are generally far more specific as they are required for specific field trials of complete farming systems.)

3) PIADIC's approach differs from CATIE's teck packs in that they are first approximations and non field tried for specific sites. Again, the effort is to develop a package to go to the field for further investigation and needed changes.

4) What the methodology can produce, other than a package for testing, is an excellent delineation or identification of needed information, its availability and quality. Thus the need to include a mixture of technical types in the methodology seminars PIADIC is giving in each country.

5) What the PIADIC research design might be, depending upon the crop, site, and known data is: 1) a farmer recommendation, 2) technology package or 3) a state of the arts report. However, PIADIC does not see these as its product. Rather, the gathering of site specific information and production of a first approximation Field Design ready for trials by local investigation agencies are the goals. The testing and dissemination are local activities.

6) The completion of a number of site specific first approxiamation throughout C.A., using similar methodologies are quite useful to local agencies and regional groups such as CATIE. The information priorities can then be addressed, analogs made, and crop investigation overlaps reduced. Further, with this experience, it becomes for easier to introduce more sophisticated farming systems methodologies to farmers, investigators, change agents, and planners.

Below is one example of the full process as seen by PIADIC and its role in the methodology introduction and standardization. In the example the CIMMYT "best bet tech pack" model the most appropriate information is used to develop design number one (D_1). Field trials are done at the farm level involving the farmer, change agent, investigator, and planner. At the end of the crop season a composite of experiences and results will produce D_2. Additional changes are also apparent in F_2, C_2, I_2P_2; and manipulation can be done to teck pack factors S/E_2, C_2, and B_2.

Special note should be taken that while D_1 might be fully applicable at the farmer level, it is likely that it is not and that it may take a D_3 or a D_4 to arrive at a verified recommendation for a farmer.

In many instances parts of the first approximation may have wide spread value and could go to the farmer, such as 1) insect control, 2) disease resistant seed, etc. This value judgment remains at the country level, however, and PIADIC sees its role in the development of the D_1 and not the dissemination processes.

D. First Approximation Recommendations-Program of Work

Phase 1

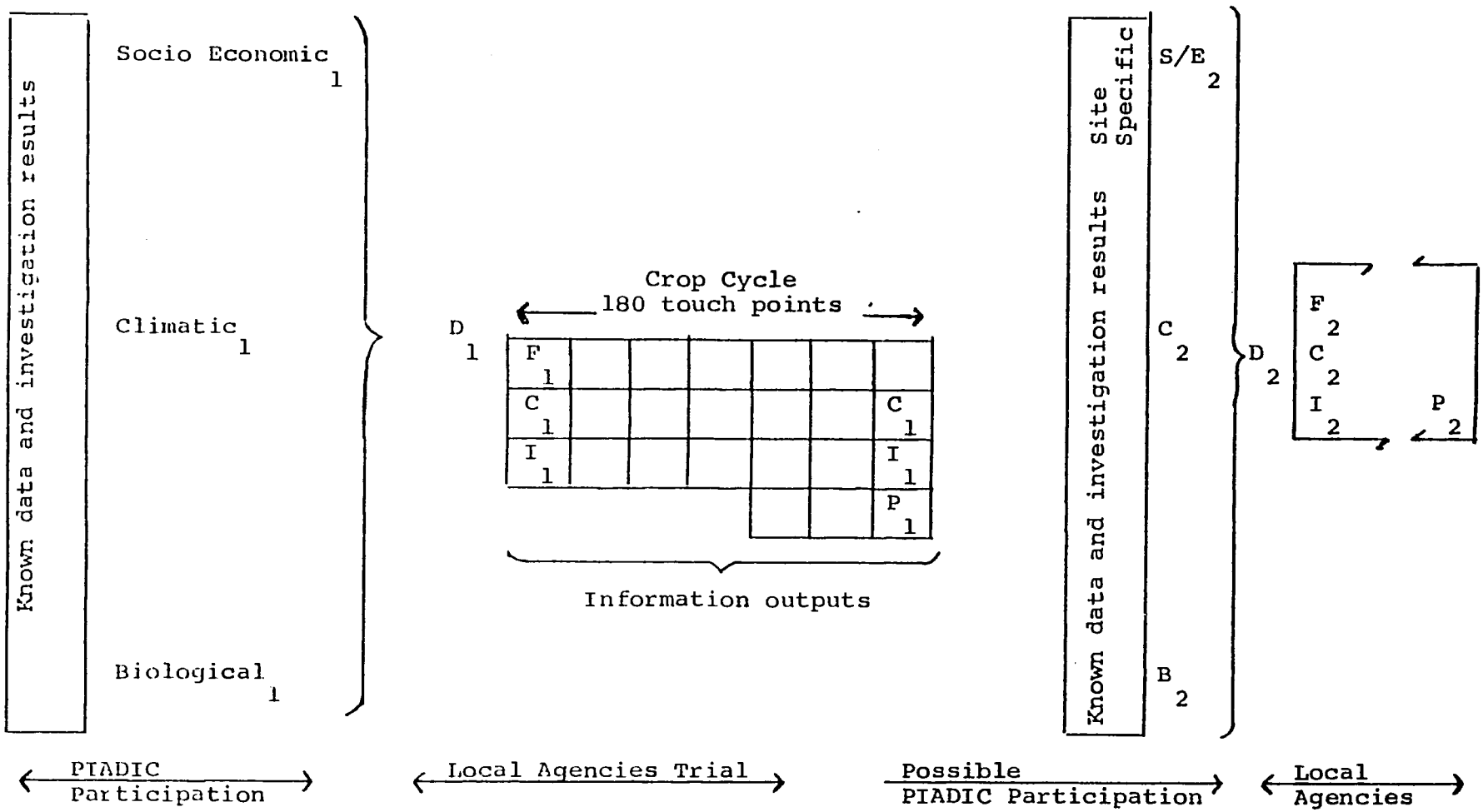
Objectives

1. Train 20-25 technicians in each country in:
   - preparation of area profiles
   - analysis of limiting factors
   - importance and use of multidisciplinary approach to interpreting the usefullness of production technological data
   - preparation of packages of production technology
   - prepare recommendations for researchers and planners for the proper recording of data for maximum usefulness

Methods

A seminar/work session will be held, involving researchers, extension agents and planners, plus (ideally) a soils tech-

Example # 1
Source CIMMYT



F = Farmer
C = Change Agent
I = Investigator
P = Planner

nician and a representation from the statistics office. About 25 total participants is ideal.

The group will select 2 or more specific area-crop combinations to multidisciplinary profile of each area. Profiles will be analyzed in workshop sessions to identify limiting factors of resources, socio-economic factors and infrastructure which limit production and/or the appropriateness of given production technologies in the area.

Phase 2

Objectives and General Means

1. The packages of appropriate and feasible production technology developed in Phase 1 will be field tested in their respective areas to verify usefulness and/or identify needed modifications.
2. Hold another seminar to develop at least 2 more packages of production technology, preferrably with different technicians in each case.
3. Hold workshops in each country with statistician researchers, and planners to coordinate the development and use of area frame statistics for general planning, evaluation of development progress, forecasting, reading farmer feedback, and;
4. Coordination of data base improvement and developing improved research results/base data recording will be furthered by including data base specialists in each information packaging seminar and the statistics use seminars.

Phase 3 - July 1980-June 1981

Objectives and General Means

1. The first packages of production technology will be field tested/verified a second time, and the second for the first time.
2. Advise in the preparation of at least two more packages.
3. Hold workshops in each country with statisticians, researchers, planners and data base technicians to establish the integrated methods for recording and processing research results, base data of various types, and agricultural statistics to enhance their usefulness in research design, information packaging and planning.

KEY AGENCIES INVOLVED IN PLAN OF WORK

Research Participants (also represent the Bio-agronomic data base)

Guatemala - ICTA, Fac. Agron.

Regional - CATIE (observer/Participant/Instructor)

Extension Participants

Guatemala - DIGESA

Planning Participants

Guatemala - USPA

DATA BASE	CLIMATE	STATISTICS	NATURAL RESOURCE
Guatemala	INSIVUMEH	USPA	ICTA, IGN

General Observer/Participants

AID Country Mission Staff
IICA Country Office Staff
BCIE
SIECA
National and Agricultural Development Banks

AGRICULTURAL RESEARCH AND INFORMATION SYSTEMS

"IOWA Model"

CENTRAL AMERICA AND PANAMA

Emphasis PIADIC Activities RE/Programmed	Stage One	Stage Two	Stage Three	Stage Four	Stage Five	Stage Six
STAGES	Scientific production of knowledge	Knowledge Management	Knowledge translation	Product development	Product dissemination	Product adoption and utilization
ACTIVITIES	Basic and applied research area carried out to produce knowledge in the form of verified statements of relationships between and among variables.	Data and information from stage one is monitured screened, indexed, catalogued, packaged and stored in a readily retrievable form at access points for later use and dissemination.	Highly skilled translators with a dual understanding of the scientific and practical conceptions of the problem code and recode the clients formulation of a problem and relevant scientific knowledge is synthesized, generalized and brought to bear on the client problem. This effort may produce papers, reports, guide lines or other information on product development.	Scientific knowledge is combined with knowledge of existing or created user needs, and products with the presumed potential to meet these needs are developed, product development usually includes analyzing and assesing alternatives, selecting the best solution, designing prototypes, testing prototypes and packaging marketable products.	Activities include making sure the product and its uses are fully understood, distributing the product, adopting and installing it and monitoring performance.	1. Users discover,diagnose problems, adopt solutions and effectively assimilate solutions. 2. If no answer is readily available that very lack will re-initiate a research process that includes all the previously discussed steps until eventually adequate and appropiate knowledge is found, developed into a solution, packaged and given back to the user for testing and possible adopting and utilization.
PIADIC WORK AREAS INFORMATION AND NUMERICAL DATA	1. Area sample frames a. Sampling rural (sector statistics)	2. Data bases a. development and memory systems in science and technology, marketing, socio-economic	3. Agricultural and technical information centers 5. Data use and outreach 3a. Small farmer area specific Profiles planning and policy	3b. Farmer recommendations	3. Ag and technical information centers - outreach.	
CATIE	YES	As input source or user	YES	YES	YES	YES
AID C.A. PROJECTS Totals	Gua - 6 Nic. 5 Hond.- 3 El S. 7 C.R.- 4 Pan 4 47	As input source or user Nic. - 2 Hon. - 2 Panama - 1 Costa Rica - 1 57	Gua - 4 Nic. - 6 Hond.- 3 El S. - 8 C.R. - 6 Pan. - 7 55	Gua - 5 Nic. 6 Hond.- 3 El S.10 C.R. - 6 Pan. 7 57	Gua - 5 Nic. - 6 Hond - 3 El S. - 10 C.R. - 6 Pan - 5 55	Gua - 4 Nic. - 3 Hond - 2 El S.- 7 C.R. - 4 Pan. 3 23

TECHNICAL ANALYSIS - CATIE (Project 596-0083)

This section contains:

A. Analysis of Small Farm Cropping Systems Project (596-0064)

1. Scope
2. Preliminary Research Results
3. Animal Systems Research to Date
4. Extrapolation Possibilities
5. Need for Evaluation of Alternatives

B. Farming Systems Recommendation Methodology

C. Extrapolation Methodology

D. Research Transfer

E. Training

F. Description of a CATIE Small Farming Systems Recommendation Document

A. Analysis of Small Farm Cropping Systems Project (596-0064)

1. Scope

CATIE's early research on multiple cropping at Turrialba, Costa Rica, in 1974 was a factor in the design and selection of this institution to manage the ROCAP/CATIE Small Farm Cropping Systems Research project (596-0064) initiated in mid-1975. The initial research at CATIE was, with this A.I.D. funding, expanded into Costa Rica (four locations), Nicaragua (two locations), Honduras (four locations) in 1976; El Salvador (two locations) in 1977 and Guatemala (one location) in 1978. CATIE staff and outreach capability have been enhanced by the addition of key resident technicians in these countries and a high caliber inter-disciplinary core staff capability at CATIE was developed to backstop the expanded program. Memorandums of understanding with all participating countries were developed and counterpart staff from national institutions were trained through on-the-job participation in the research and in short courses. Over two hundred Central American technicians have received training or participated in one or more workshops or short courses. In addition, technicians from Panama, Ecuador, Colombia, Peru and Bolivia, at their own governments' or USAID expense, participated in these short courses because of the growing interest in this topic.

The expansion of the initial CATIE research into the countries of Central America and most recently into Panama, have developed greatly improved linkages between CATIE and national governments. Nicaragua, probably as a result of the cropping systems project, became a contributing member of CATIE in early 1978 and Honduras and El Salvador are now in the process of becoming supporting members.

Research conducted in the countries have been at the small farm level. Surveys of farm practices in each project area have been carried out with collaboration of national counterparts to identify the priority small farmer, socio-economic and production constraints which can be addressed through project research. Additional in-depth studies of a few selected small farmers and their farming operations over an extended timeframe have been carried out to better understand their problems and the dynamics of their lifestyle, financial budgeting, decision-making, and production situation. Over one hundred replicated field experiments have been carried out in Central America countries in the research areas where this work is concentrated. In addition, a CATIE, over fifty studies related to the development of research methodologies and MSc. level thesis projects have been completed on special problems.

The CATIE team is at present completing data collection for the final set of field trials for the crop year of 1978. As these are completed, the data is being analyzed at CATIE, results evaluated and the final nine farmer recommendation documents drafted to meet their responsibility under the present agreement. The first document was completed in draft form in October 1978 for an improved system in Nicaragua.

In the process of conducting the cropping system research project, over eighty-five articles, reports, and course lecture manuscripts have been prepared for presentation in various fora or for publication in popular and scientific journals. In addition, some thirty Masters degree thesis projects have been completed or are in process under the guidance of CATIE staff members on some aspect of cropping systems. These students are from various Central American countries, South American countries, the Caribbean, and the United States.

2. Preliminary Research Results of Small Farm Cropping System Research in Central America

The CATIE/ROCAP Small Farm Cropping Systems research project was initiated in June 1975. Initial methodological work carried out by CATIE at Turrialba, Costa Rica was extended into Costa Rica, Nicaragua and Honduras in 1976, in El Salvador in 1977 and in Guatemala in early 1978. National research is carried out with the active participation by national research agencies in the design, implementation and evaluation of field surveys and applied research. Results from over one hundred replicated trials carried out on several hundred small farms[1/] are presently being summarized and developed into cropping systems farm recommendations at this time. At least ten improved recommendations will be prepared by CATIE.

The Small Farm Cropping System research utilizes several basic production patterns (sequential plantings, multiple cropping, etc.) and seeks to build on the basic farm production system of small farmers in the areas in which it works in each country. The

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1/ Farm size varied from three to eight hectares of cultivable land.

primary focus is on the improvement of the production system for the entire period of crop production during the year. The research emphasizes the best use of the two primary limiting factors for plant production in the tropics -- effective use of the available sunlight for the total period during which adequate moisture is available for plant growth. Other factors such as control of pests and diseases, plant nutrition, weed control, etc., which can be affected by changing the commodity mix and supplying essential inputs -- to the extent that these are economically beneficial -- are included in the research and the ultimate recommendation of the proposed new system.

To compare multiple cropping research with normal single crop studies in the small farm context, various changes must be made in both data collection and analysis of different systems. In single crop research results may be compared on the basis of statistically significant differences in yield of edible product. As examples comparison of ten varieties of corn or comparison of different chemicals or concentrations of chemicals in corn production can be evaluated by measuring their effects on yield. This is not feasible in multiple or sequential cropping since it is not possible to evaluate differences on a yield basis when corn, tomatoes and radishes are grown in different combinations or in different sequential patterns during the production year.

As a result, in the small farm cropping systems research, measures of differences have been based on factors which permit comparison of different cropping patterns and commodity mixes. The principal ones used are (1) net income, (2) carbohydrate production, (3) protein production, (4) total biomass or the total dry weight of the above ground portion and (5) the land equivalent ratio of the plants in a given area of land or the comparative plant density of each commodity planted in a system as compared with a full stand of the same commodities planted separately, as single crops. To arrive at the above, other data including cost of planting materials, labor requirements, cost of inputs and their application, weight of the edible portion of the crop, market (farm) prices, pest incidence, land rental costs, etc., are collected on each field plot to provide data needed to make the above comparisons.

Although full analysis of the results of the field data are not yet completed, some interesting results are available from different sites indicating progress potentials over existing small farm systems in Central America.

In terms of net income per hectare of land in research carried out near Samulalí, Nicaragua, comparison was made between the local small farm system of corn normally planted in May at the beginning of the rains and beans planted as an intercrop in September and an improved alternative system of corn and beans where recommendations for planting distances, planting dates, fertilizer recommendations, weed control and post harvest control of pests were changed as a

result of research. The changes are reflected in a three percent increase in labor expenditure, nine percent increase in materials and overall investment and a 361 percent increase in net profit (conventional system $13.00 - $116.00 per hectare as against $535.00 - $619.00 per hectare per year).

Production of carbohydrates is an important factor in considering different crop mixes and production systems since carbohydrates are among the most limiting factors in the Central American rural diets. Using conventional systems of corn and beans (two crops of corn and one of beans) the total production per growing season per hectare in Central America would average approximately 90 CWT of dry shelled corn and 10 CWT of beans. This would provide a total of 16,280 M calories per hectare per year. Using multiple cropping systems at Turrialba, Costa Rica, the ten local combinations of corn, beans, yuca, had caloric yields of from 23,699 to 31,239 M calories in 1976-1977 and from 23,420 to 32,470 in 1977-1978. In another area of Costa Rica corn, cowpeas and sweet potato yielded from 39,758 to over 130,000 M calories/Ha. in the 1977-1978 planting season.

INCAP estimates the mean caloric requirements of Central American people per capita (average for all ages) at 940 M calories per year. Where the average traditional small farm system of corn and beans can provide the caloric requirements of approximately 14 people per year per hectare, improved systems have increased yields considerably above these levels.

Some data on protein production from combinations of corn, beans, cowpeas in CATIE trials have yielded over 800 kg. of vegetable protein per hectare per cropping season. Although the amino acid balance of vegetable protein is not completely equivalent to that of animal protein, this yield expressed in terms of human nutrition would be equivalent to supplying the minimum requirements of over 35 people annually per hectare. Though high, it is believed that these figures can be surpassed considerably in future research.

Field research data are collected on total biomass (e.g., the total dry weight of the above ground vegetative material of all plants growing in a system) in addition to that portion used for human consumption. This non-human consumed vegetative material can be used in large extent to feed animals. Figures for many cropping combinations exceed 30,000 M calories which if properly stored and mixed with other essential nutrients, can make a significant contribution to feeding small or large animals.

Other factors which have been found through this research to contribute to small farmer welfare are:

(a) Land use: Data indicates that the "effective farm size" through multiple cropping can be increased often in excess of 100 percent in terms of plant density as compared to single crop plantings of the same combination.

(b) Use of fertilizer: Though the best methods of fertilizing (time, rate and placement) multiple cropping combinations are not yet known, CATIE has undertaken various trials both at Turrialba and in other cooperating Central American countries. Results from these trials have been varied both in yield effect and their contribution to the total profit of the system. However, in several trials, the effective efficiency of the applied fertilizer have been increased over 50 percent as compared with the same applications made to the same single crop.

(c) Insects: Various combinations and different planting dates of crops in a combination can have a significant effect on the balance of detrimental to beneficial insects in a field without changing the total insect population significantly. Damage due to insects have been often reduced very significantly in selected cropping combinations -- often to the point where chemical control is not economic.

(d) Diseases: In some combinations, such as corn and yuca, the incidence of mosaic in yuca can be very significantly reduced when corn is planted shortly before or at the same time as the yuca. This appears to be due to the change in the leaf abrasion rate due to wind damage, permitting the disease entrance into the yuca leaves. When corn is grown in rows across the prevailing windstream, it reduces the damage caused by one yuca leaf rubbing against another and hence reduces significantly the early effects of mosaic on yuca growth and potential yield. Many other potential changes in pest damage undoubtedly exist which can be exploited by small farmers to increase their income and reduce environmental hazards caused by chemical application.

(e) Weed control: Weed problems on small farms are generally of two types, (a) control of weeds before or at the time of planting and (b) weed control while the crop is growing. CATIE has done some interesting research on both problems. The control of weeds (minimum tillage) and a reduction of fertilizer application of 30 percent have resulted in no statistically significant decrease in corn yield when compared to plowing and higher fertilizer application in the first crop. In the second crop minimum tillage increased corn yield significantly over plowing. In addition, no tillage reduced the weed population significantly in the test plots further reducing later weeding costs and farm labor requirements for this operation. The reduction of production costs, over a two-year period on a per hectare basis, using the pre-planting weed cover as a mulch or using a chemical weed killer at pre-planting when compared to conventional land clearing and weeding was significant. Where normal small farmer practices were used, the cost was $90.59 U.S., while the mulch weeding treatment cost $31.76 U.S., and the chemical treatment cost $29.65 per hectare.

3. Animal Systems Research to Date

Animal production research was started more than 25 years ago with the establishment of IICA at Turrialba. Since 1973 CATIE's animal

production program has oriented its research and training toward the development of dairy and meat production systems for the tropics where cattle derive the major portion of their nourishment from forages. This has suggested cattle production based upon the most efficient use of pasture, as the principal resource, supplemented by agricultural and industrial by-products.

The research activity developed by the Cattle and Small Animals Program has focused on soils, plants, environments, and animals basic components of production. Intensive milk production and other systems are being developed. Research results indicate that it is possible to produce more than 12,000 Kg. of milk per hectare per year based on the intensive use of African Star grass supplemented by liquid concentrates from cane molasses. An additive effect of the concentrate (over and above the pasture) yielding milk production increases on the order of 30 percent has been demonstrated. Research has shown that similar increases in beef production can be obtained from supplemental feeding with agricultural by-products.

The CATIE Dairy Production System has been shown to yield high levels of income from milk production using resources readily available to the small farmer. The system is now being tested by small farmers in Costa Rica and Honduras.

The Cattle and Small Animals Program of CATIE is currently working to integrate dairy and beef systems based on the use of crop residues as a first step to mixed farming systems. This project is evaluating the use of corn and bean residues, cassava and sweet potatoes as the basis for a small farm animal system. Other research concerns are the use of hay and silage to preserve forages and crops for use during the dry season.

CATIE has had four years of project cooperation with Panama and in Costa Rica long term collaboration between the CATIE program and the Ministry of Agriculture continues with two cooperating projects. In Nicaragua the program has collaborated in the use of by-products as a feed supply during periods of drought. CATIE has a contract with the Central Bank of Honduras to reinforce that country's Cattle Development Project through technical assistance, and in El Salvador the program has helped the animal research program of CENTA to orient its work on the needs of small farmers.

CATIE also is studying the potential use of trees as a source of forage for animals as well as for fuel and conservation. Research is being carried out with species which will be used as living fences and shade for cattle; the foliage, which is protein-rich, will be tested in animal feeding.

CATIE has recognized the growing need for research on the small animal species (swine, poultry, sheep, goats) which are important as sources of human protein and are ubiquitous at the small farmer level throughout Central America. Research plans call for early attention to the feeding of small animals within the small farm systems context. Low cost diets are essential for profitable swine and poultry operations, but no international research centers are

pursuing this line of research. Thus CATIE's program will be breaking new ground.

4. Extrapolation Possibilities

In Central America, at the present time, technical resources for conducting area-specific research are limited (though increasing). Therefore, a methodology for extrapolating cropping systems research will greatly increase the efficiency of the available resources, and could prove adaptable to a broad range of other possible uses.

Extrapolation of research results and technology for single and multiple elements (e.g., fertilizers, breed improvement, pest control, mechanization, etc.) have been employed by large farmers and have been successful as can be observed from the success of large farm poultry, beef, cattle, dairy, rice, cotton and sugar cane enterprises. The technology in many cases has been transferred directly (with minimum modification through trial and error experience) from one geographic area to another. Some extrapolation of small farmers' systems also has been made possible through a trial and error type of research process in the case of certain grain and root crops.

It is feasible to extrapolate mono-product systems based on the understanding of factors which most influence crops and animals because quantification of such factors is generally easy and reliable. Initially, for extrapolating yields and production pattern potential, it appears unnecessary to have a complete mathematical mode. Extrapolation can be achieved by measuring determinant ecological and socio-economic variables and performing a discrete analysis of individual components and their interactions within these variables. Ultimately, however, it will be necessary to evolve models and conduct gradient research in order to meet the requirements of transfer agents charged with providing information to all small and medium sized farm operators in their country.

Cropping and farming systems research makes use of information obtained by direct study as well as from secondary sources including data collected periodically by meteorological stations, sample frame surveys, and census activities. These bases are reasonably well documented, constantly improving in Central America, and represent data obtained from a broad and continually evolving spectrum of knowledge on tropical crops and animals and the production and marketing factors which enhance their utility to small farmers.

Technical personnel at CATIE have accrued solid field experience in carrying out the description, design, and testing phases of cropping systems research methodology for specific areas. In addition to this, CATIE's staff is highly qualified through previous experience to provide technical back-stopping to counterpart technicians and expand field and laboratory research both at Turrialba and in Central American countries for quantification of crop, animal, and mixed-farming interactions.

Cropping and animal farming systems research must, by its nature, be an inter-disciplinary effort. In-country counterpart technical workers are increasingly being organized as inter-disciplinary groups for studying cropping systems of small farmers in the field. National technicians are, in rapidly increasing numbers, better trained, more field oriented and more understanding of the needs of their target population and the productive potential for the tropics. This organization makes the acceptance of the project, by country technicians and small farmers, both viable and relevant.

The methodology for extrapolation, though highly experimental in nature, appears technically feasible because identification and measurement of cropping systems determinant variables can be performed with increasing accuracy. Conceptually, cropping systems determinants are relatively few and increasingly quantifiable through use of new methods and equipment for a given ecological situation. In practice they are relatively small in number, thus increasingly more easily managed and studied using modern data collection and processing techniques. Variable which determine cropping pattern management have been shown to be easily identified and dealt with at the farm level. Most of the variables presently considered important have been included in the soil analog classification system being developed for Central America. Therefore, as climatological data are similarly quantified under the SFPS project, a tested methodology to determine similarities among areas can become increasingly more accurate and reliable for first approximation extrapolation. Socio-economic determinants for component technology will be superimposed on soil and climatic parameters in analogous areas in order to obtain a second approximation extrapolation and the basis for correlation research.

Transfer agents of agricultural information in Central America at present usually transfer monocrop or single animal type or single component recommendations (e.g., control of an insect or nitrogen level type recommendations) prepared from data obtained by other research approaches. However, the methods of information transference now in use by the countries of the region and their mass media facilities are considered to be inadequate to transfer whole farming systems recommendations. As new systems are introduced, innovations will be necessary in developing appropriate small farmer information transfer mechanisms and methods of integrating transfer procedures in a systematic manner in order to reach farmers more effectively. Research as well as training of transfer agents will be needed to handle these new approaches. Additionally, it will be necessary under this project to develop new outreach techniques to deliver effectively to the farmer the new, more complicated information in an understandable and utilizable form.

Because cropping systems research is relatively recent worldwide, and documentation is needed for this (as for other kinds of agronomic research), CATIE has been collecting and cataloging relevant cropping and animal system literature on the subject from all available sources. These documents, now totalling over three thousand, will be made available to collaborating national technicians

Information from meteorological data in Central America (temperature, moisture availability, radiation) at several levels of confidence and time intervals will be made available to counterpart technicians and national research institutions (as will area sampling and other data from IICA). These data will be useful to national researchers (in developing single crop analogs to expand the utility of national research) as well as to the SFPS project.

In the process of developing an extrapolation methodology, several variables will be defined, tested, and evaluated which, if suitable for improving site-specific cropping systems, can also be very useful in areas far removed from Central America. Results, if successful, could form a basis for an international research network based on a reproduceable, systematic approach not presently available.

5. Need for Evaluation of Alternatives

Evaluation is a complex and continuous process. Long-term evaluation efforts are needed before a definitive judgment about a particular set of technological alternatives and its acceptability by farmers can be made. Evaluation criteria include adaptability of technology to ecological and socio-economic conditions, simplicity of management, congruency of improved technology with existing farming systems, profitability, and effects on employment and nutrition. CATIE will depend upon a wide network of research activities to facilitate this process.

In addition to the support of this on-going SFPS project by A.I.D. (ROCAP, DSB, and the International Weed Control project of Oregon State University), CATIE receives support for field activities in Honduras, Nicaragua and El Salvador from the IDRC (Canada), and the ODM (UK) contributes an entomologist. CIAT cooperates in testing of bean and cassava varieties for use in small farm cropping systems, and CIP helps in the testing of white potato varieties for cropping systems at low tropical elevations of tropics.

Information materials related to cropping systems are exchanged with IRRI, ICRISAT, AVRDC, and IITA and liaison is further maintained by visits of staff members from those international centers to CATIE. CATIE also maintains communication with the TAC committee of the consultative group of the International Agriculture Centers. In addition, IICA supports the core budget of CATIE, maintains the library at Turrialba, and provides office space and logistic support at the country level through its national offices.

CATIE also serves as a documentation center for publications of interest to collaborating institutions, and through an agreement with the University of Costa Rica, CATIE conducts a graduate program in Tropical Agriculture. Since 1975, MSc. students from 19 countries have completed thesis work on a range of topics oriented around cropping systems.

B. Farming Systems Recommendation Methodology - The Approach

Recommendations developed by the SFPS project will be aimed toward the improvement of existing crop, crop-animal, and animal production systems, and will alter them by adding or substituting new crops or animal components or by changing the relative importance of resource allocation within a given production system. Recommendations developed will include basic food crops (corn, rice, beans, sorghum) and at least one non locally traditional crop in the case of crop systems. In the case of mixed farming and animal systems they will include dual purpose crops and one or more small or large animal types, pasture and/or cut feed component. Recommendations will be small farmer area specific. Section F of this Annex contains a detailed description of a CATIE small farming systems recommendation document.

The research methodology for the development of recommendations will include the following activities:

1. Selection and description of primary target areas, socio-economic surveys and analysis of existing farming systems;

2. Design of alternative small farm production patterns;

3. Components research for small farm systems;

4. Production patterns and management testing (field testing of recommendations;

5. Socio-economic adjustment of production patterns and management options.

These five activities will all be initiated within the first two years of the project in all primary target areas. As soon as all primary target areas are identified, the target area descriptions will be undertaken and activities 2 to 5 will be carried out until the recommendations are ready for release. Recommendations will be continuously improved or updated during the life of the project.

1. Selection and Description of Primary Target Area

Some of the criteria that will be used for the selection of a primary target area include:

(a) National priorities for area research;
(b) High degree of homogenity of the proposed area;
(c) High incidence of small farms;
(d) Potential for improvement of existing farming system;
(e) Degree of uniformity in cropping, cropping-animal and/or animal patterns potential;
(f) Capacity of market and marketing channels to handle the increased production.

CATIE and national research institution representatives will select 18 primary target areas in Central America and Panama. Using the data initially generated under the PIADIC project, CATIE and national institutions will further delineate this information through baseline studies to be conducted in each area to obtain an accurate description of small farm production characteristics and socio-economic conditions. Environmental variables will be recorded from secondary and primary data, a description of the prevailing farming systems will be made together with a baseline study of the levels of well-being of farmers and their families, and major constraints on crop, crop-animal, and animal production systems will be identified. Special consideration will be given to marketing channel analysis, with emphasis on perishable products (eggs, milk, horticultural crops, etc.) as well as credit channels and availabilities, information transfer capabilities, and other relevant factors. An initial field survey will be conducted on the target areas and a representative sample of small farms will be studied in sufficient depth for research design purposes. The size of the sample will depend on the size of the area, homogenity of production patterns, available resources, etc. In any case a minimum of 60 randomly selected farms will be analyzed in each area in depth. Climatic variables such as patterns of rainfall, temperature, and luminosity will be continuously recorded as soon as the area is accepted for field research.

When the baseline study is completed, the information (and the resulting written summary) will become an initial element of the recommendations. Publications on the characteristics of each target area will be prepared (the actual production systems of small farmers in the area will become a sub-report) and the potential for improvement through new production patterns and other factors will be estimated as a basis for research planning. This phase will be concluded within the first two years of the project even though periodic specific surveys and environmental variables recordings may be conducted throughout the project to record changes in target area characteristics.

Baseline studies will be conducted largely by national counterpart institution personnel with assistance and active cooperation and training by CATIE resident and core staff, as well as PIADIC.

2. Design of Alternative Small Farm Production Patterns

Based on the area classification, small farmers' needs, and the efficiency of resource utilization, a decision will be made as to whether an improved technology should be applied to (1) management of existing production patterns, (2) substitution of crops and animal species within existing patterns, or (3) the creation of completely new cropping, cropping-animal, and/or animal production patterns. Concerning the latter possibility, completely new pattern testing will seldom be done until a good design capability has been developed. In general, project practice will be to start where the farmers are and build on that system rather than initiate

a system so alien to their experience that they find it too difficult to accept and adjust to, or that it creates demands for extremely high levels of credit, inputs, risks or use of non-conventional market systems.

At this stage primary consideration will be given to the physical aspects of the production potential within the cropping-animal systems. Broad socio-economic considerations will eliminate only the obviously impossible or most ineffective options. Careful consideration must be given to assuring that the proposed technology can be made compatible with the farmers' objectives and capabilities within an estimate of the limits of available resources.

Since systems research for small farms is a relatively new research approach, the methodology for the design of alternatives will undergo constant refinement by CATIE's inter-disciplinary staff and their counterparts. At the beginning of the project an inductive, subjective process based on the broad experience of the inter-disciplinary team will be used. As some of the determinant variables of target areas become available, the design will be increasingly based on analyses of discrete components and their inter-actions with environmental and economic variables. Ultimately the methodologies will evolve toward a complete modeling and programmable capability.

3. Components Research for Small Farm Systems

This activity will apply more to development of mixed (crop-animal) and animal systems development than to cropping systems. For cropping systems, pest management research trials will be conducted and research trials will be planned to fill the blanks in the recommendations. Those trials will concentrate on environment-technology interactions.

The animal component of this project will work with small animals (chickens, ducks, pigs, tropical sheep, bees) and dairy and beef cattle. It will not have had the benefit of extensive previous work (as will be the case for cropping systems) and thus model systems will not be ready for field testing (except for the dairy cattle system). Also, the mixed crop-animal systems will require a research phase to estimate and test optimum capital and natural resource utilization relationships between crops and animals under small farm conditions.

The procedure for developing animal components in this project will be through animal-oriented collection of baseline data, identification of actual animal production systems used on small farms, documentation or major constraints, cataloging of feeding resources, selection of animal species and types best suited to the resources, research on the constraints as components of the system, the design of systems of animal production patterns with management recommendations, the conduct of pilot programs, and the validation of systems at the farm level. It is expected that this phase of work will be carried out simultaneously with the production pattern design and field testing conducted on cooperating small farms.

Because animals are not as environmentally specific as plants (within a certain range), some of the existant Central America and semi-temperate research results can be extrapolated to field target areas. However, it will be necessary to conduct research in primary target areas on those production system components which are affected by environmental/technological inter-actions.

4. Production Patterns and Management Testing

The main objectives for this phase are:

- To quantifiably test the production potential of systems alternatives and compare them with current farm production;
- To quantifiably measure technology/environment inter-action;
- To select superior options of component technology for inclusion in systems.

The amount of testing to be done will depend to some extent on how much component technology research may have been done previously in the primary target area.

5. Socio-Economic Adjustment of Production Patterns and Management Options

As results of production pattern and management testing evolve, the economists will compare the new options with present farmer practices, assuming different levels of economic, human, and land resource availabilities. Multiple options in farm management terms will emerge based upon labor requirements and availability, cash availability, farm size, farming system (crop, mixed or animal) and other relevant considerations. These final adjustments will provide the basic information to be incorporated into recommentaions ready for extensive use in each target area.

The updating of recommendations will be a periodic process to some extent beyond the scope of this project. However, this project will provide technical assistance and/or additional research on adjustments to recommendations that have been developed and are being transferred to farmers in the utilization phase of this program based upon farmer feedback. And the project may help develop new options based on changes in cost/benefit relationships, major shifts in the availability of inputs, new market prospects, and/or small farmer capabilities and attitudes.

C. Extrapolation Methodology

1. Introduction

Summarized below are the research activities that will be undertaken to produce the cropping system extrapolation methodology. Methodology evaluation activities will focus primarily on cropping system extrapolation rather than animal or mixed systems because

some ten tested recommendations will have been developed as a result of the SFPS project that can be used as basic tools for testing extrapolation. This approach will also be applicable to the monocrop production systems being developed by national research agencies using PIADIC assistance. An important assumption upon which the following procedure is based is that an extrapolation methodology cannot be recommended until it has been evaluated under real conditions.

The extrapolation methodology which will be made available to national programs at the end of the project will include primary types of information: Recommendations which describe environment-cropping system relationships, and comparative location data and relationships which will allow the transfer of the tech-packs from primary target areas to secondary target areas with a high degree of production correlation. Research activities will therefore concentrate on the definition of location relationships and the adjustment of existing tech-packs to minor changes found between primary and secondary target areas. The use of existing recommend-ations, rather than the generation of new ones, will require that the primary target areas be those where they have been, or soon will be, produced.

Evaluation of extrapolation methodology is not now a high priority of any of the national cropping systems research programs since this is a relatively new and experimental area of agronomic research. Many of these national cropping systems programs are just beginning, and, although the potential for extrapolation methodology is understood by some individuals within the national programs, they either have no resources available, or insufficient understanding by senior government officials of the major benefits to be derived from this type of investigation. This component, if successful, will provide the data, tools, and methodologies through which national programs can begin to utilize research results in new, more cost-effective ways.

2. General Procedure

(a) A minimum of three primary target areas will be selected from those where site-specific recommendations have been tested and produced. The criteria for primary target area selection will include:

(i) The degree to which the climatic and soil characteristics of the area are representative of ecological zones where small farmers are commonly located in other Central American areas;

(ii) The importance or agronomic and socio-economic potential of the cropping system described;

(iii) The technical quality of the descriptions of environment-system relationships;

(iv) National priorities.

(b) The environmental characteristics (rainfall pattern, topography, etc.) of the primary target area which determine the selection of croppings systems by farmers within the area, and the management of these systems, will already have been described for CATIE-developed systems; nationally developed systems may require additional description of the ecological parameters of the area in which the research was conducted before it can be used in extrapolation research.

(c) Two or more secondary target areas will be located for each primary target area, for a total of at least six target areas. The criteria for secondary target area selection will include:

(i) The environmental characteristics of the secondary target area which most affect cropping system slection and potential;

(ii) The cropping systems currently being used by the farmers within the area;

(iii) The homogenity of environmental characteristics, cropping systems, and types of farmers within the proposed secondary target area. The extrapolation approach followed will determine the extent to which homogenity is required or if, in fact, a quantifiable variation in an environmental factor within the area is required.

(iv) National priorities and cooperation in carrying out extrapolation research in a given area;

(d) The environmental relationships between primary and secondary target areas will be quantified. It will be determined if the two environments are sufficiently similar to make the site-specific recommendations generated in the primary target area a valid recommendation within the secondary target area (i.e., whether the two are analogous environments) or if the primary and secondary target areas are substantially similar but differ regarding a quantifiable environmental factor or factors so as to require changes in the application of primary target area recommendations in the secondary area (e.g., changes in the soil fertility recommendations).

(e) The relationship between primary and secondary target areas and the environment-system information will be used to predict either the potential of a new cropping system for the secondary target area or the potential of a management practice for a cropping system transferred from the primary to the secondary target areas.

(f) Field experimentation will be conducted to determine the actual response attained under the secondary target area condition to determine the fit between predicted far level response and actual response.

(g) Field testing and data analysis will continue until the demonstrated correlations are sufficiently close to promulgation of the methodology and warrant the initiation of training for national technicians in its use.

D. Research Transfer

Each outreach test will be implemented in seven stages. The activities within each stage will be specific to the site and will be spelled out in the steering committee's plan of action. The actual test in each country may differ so different approaches are emphasized; however, the general methodology is described below.

1. Local Understanding and Support

The first step in implementation will be to meet with local authorities to gain their understanding and support. Additional contacts with local leaders and groups will be made in accordance with local customs and culture.

2. Message Development

Project and collaborating national technicians will provide the recommendations to be used. They will work with the outreach testing group in adapting that technical information for transmission to farmers via the various media to be used.

3. Preparation of Educational Materials

Primary responsibility for this stage will rest with the information transfer agencies assisted by the national outreach testing coordinator and the project's agricultural information specialist. The research technicians will function as consultants and will check materials for technical accuracy. This phase will include scheduling the use of information with respect to time and media, as well as the preparation of audio, graphic and other materials required by the particular delivery system to be employed. For some materials it might be feasible to contract for production of the finished product (for example, the Basic Village Education Program in Guatemala could produce and record radio programs from scripts written by national staffs for their outreach testing programs).

4. Initial Information Campaign

At the beginning of the outreach test, all appropriate media may be used in efforts to make every farmer in the test area aware of the program, and to introduce basic concepts related to the recommendations. Mass media (radio, posters, flyers) may be used extensively in this phase. Institutions which can provide technical assistance to farmers (such as extension agencies, cooperatives, and agricultural banks) may transmit outreach test information through their regular channels and use meetings with farmers to explain the program. The principal contribution at this point

of some collaborating agencies (such as input distributors) may be participation in the widespread distribution of graphic and printed materials throughout the test area.

5. Demonstration and Reinforcement

Following the initial saturation campaign the test program will continue to provide farmers in the test area with a steady stream of the information they need to implement the tech-pack successfully. Radio use may be continued to provide both information and continuity. Posters, flyers, and other general distribution materials may receive less emphasis. A new medium, the whole farm demonstration, may become more prominent during this stage. The approach would be to work with farmers who are willing to collaborate with the outreach testing team in demonstrating the use of the recommendations on their entire farm (or the portion for which adapted). The number of such demonstrations would be limited by the number of participating agency technicians available. A strong multiplier effect could be obtained through organizing farmer field days at the sites, informing people about the demonstrations through other media, and disseminating the results obtained throughout the entire test area.

6. Feedback

Frequent, regular and reliable feedback will be developed for the life of the outreach test. This feedback system will be a part of the plan of action prepared by the steering committee. It will employ both local contacts and field staff to collect and verify information from people in the test area; that information will then be assessed, summarized, and distributed to research transfer and service agencies for their study and appropriate response.

7. Second Year Follow-Up

The same general techniques will be employed as in the first year, but at a lower level of effort. The use of an initial saturation effort followed by reinforcement at a lower level of effort will help to extend the number of farmers and the size of the area that can be covered adequately with a given level of resources. Varying the pace of programming in this manner will also minimize the problem of decreasing interest which often comes with increasing familiarity.

8. Evaluation

The outreach tests will be under continuous operational evalution through the feedback systems described above. An evaluation of final results obtained will also be prepared to provide guidance for future tests and program activities. A specific plan for such an evaluation will be developed during the period of program preparation.

The evaluation plan will include a baseline survey of farmers before the outreach test starts, followed by a re-survey at the end of the second year. Relevant indicators such as credit extended, input sales, and volume of product reaching the market will be used as supplementary evidence of change. The value of the recommendations to the farmer in increasing the return from his farm enterprise, and the cost effectiveness of information delivery systems utilized, will be assessed in the evaulation.

E. Training

1. Introduction

Training will be imperative to assist in further developing and strengthening the capabilities of national institutions in the conduct of small farm production systems research. Training also will be a means for transferring small farm production system research methodology to cooperating institutions.

Training activities will be conducted for national research personnel, national transfer agents, and national planning and programming personnel.

2. Training of National Research Personnel

Research personnel will be trained on the job. Seminars will be held both in the cooperating countries and at CATIE on subjects such as conceptual principles, environmental descriptions, designing or modelling of new systems, testing of newly designed systems, evaluation of research results, and extrapolation of research results and recommendations. The training will be carried out in steps and in areas assigned to the researchers through the national programs. Specialists from CATIE will work along side national technicians on all aspects related to the various disciplines essential to systems research. Such disciplines will encompass entomology, crop and animal management, soil fertility, tropical pastures development, weed management, plant pathology, plant physiology, animal diseases, and others. The training will be aimed at developing the capability of national researchers to conduct area-specific farm systems research. This will establish the basis for cooperative activities throughout the various phases of the project.

Training will also be extended to technicians in Ingeniero Agrónomo and Masters level programs by providing assistance for thesis research in-country or at CATIE and under the direction of CATIE senior staff. Workshops will be held at CATIE and cooperating institutions on subjects related to special features of cropping, animal, and mixed farming systems research including climate classification, farming systems surveys, experimental designs for farming systems research, analysis of field data, and development of tech-packs.

3. Training of National Transfer Personnel

Transfer agents will receive training initially on the use of cropping recommendations and, as they become available, animal and farming systems production recommendations; improved transfer techniques and feedback information from the farmer for their further improvement by farming system researchers also will be covered. The use of farming systems oriented recommendations requires a firm understanding of the inter-relations of farming systems components and the need to transfer the elements of the system as a unit. National transfer agents will be instructed in ways of obtaining baseline information which later will be used to assess the impact of different recommendations on the farm production systems and developing demonstration plots on cooperating farms. Training will be done both at CATIE and in the cooperating countries through on-the-job experience, seminars, workshops, short courses and graduate level work.

F. Description of CATIE Small Farming Production Systems Recommendation Document

Outline: The general outline of the document containing small farmer recommendations will be as shown below:

Crop Farming System	Animal Farming System	Mixed Farming System
1. Target area description	1. Target area description	1. Target area description
2. Crop pattern alternatives	2. Animal and forage pattern alternatives	2. Crop and animal pattern alternatives
3. Crop management alternatives	3. Animal and forage management alternatives	3. Crop and animal management alternatives
4. System integration information	4. System integration information	4. System integration information
5. Estimate of small farm benefits	5. Estimate of small farm benefits	5. Estimate of small farm benefits
6. Estimate of input costs	6. Estimate of input costs	6. Estimate of input costs

Specific Contents

1. Target Area Description. The target area description will include:

(a) Geographic and topographic description of the target area;
(b) Summary of the soil classification for the target area;
(c) An estimate of the number of farms and farm size;
(d) Socio-economic data on farm families;
(e) Climatological information;
(f) Existing farm production patterns;
(g) Market outlet and infrastructure;
(h) Public and private sector information and input supply situation.

2. Crop Pattern Alternative. The crop pattern alternative description will include:

(a) A description of the crop options based on the potential of the target area;
(b) A detailed account of the physical factors which influence each crop within a given system;
(c) A planting calendar for crop options and farm unit management methods;
(d) The predicted benefits of the suggested options in total farm income and return on investment;
(e) The costs of each option including inputs, management, marketing, and other cost factors.

3. Animal Pattern Alternatives. The animal pattern alternative description will include:

(a) A description of the animal production options compatible with a given cropping pattern of the target area;
(b) An animal production calendar for animal options and farm unit management methods;
(c) A detailed account of the physical factors affecting available feed resources in the target area for each crop, yields of pasture, forage and crop residues, and their nutritional value;
(d) Availability of by-products, pasture and forages throughout the year, methods of on-farm storage, and any deficits of nutrients requiring outside acquisition;
(e) The benefits and costs of the suggested options.

4. Management Alternatives. The management alternatives will include:

Crop Farming Systems	Animal Farming Systems	Mixed Farming Systems
a. Land preparation	a. Breeds and breeding systems	a. Preferred farm organization for distribution of physical resources among crops, animal and pastures
b. Planting methods	b. Reproduction and fertility	b. Land preparation, animal housing facilities and their physical requirements
c. Varieties	c. Varieties	c. Crop varieties and animal breeds recommended
d. Plant density	d. Life cycle feeding systems	d. Planting density, animal numbers and planting procedures
e. Fertilizer levels	e. Production, storage and use of feeds	e. Live cycle feeding system and plant nutritional recommendations

f. Weed control	f. Animal management practices	f. Disease, weed, and pest management
g. Pest management	g. Disease and pest control	g. Production, storage utilization of feeds or plants
h. Harvesting methods	h. Structures and equipment	h. Plant and animal equipment
i. Storage	i. Storage	i. Harvesting and storage methods for plants and animals
j. Transport and marketing	j. Transport and marketing	j. Transport and marketing

5. System Integration Information. The information provided or system integration will include:

(a) Estimated cash flows based on inputs and outputs from crop, animal, and mixed farming production systems;
(b) Estimated time-phased labor requirements;
(c) Estimated productivity at given management levels;
(d) Cost-benefit relationships of the alternatives and a comparison with prevailing systems;
(e) Local market potential;
(f) Estimate of small farm benefits which will include:
  (1) Estimated net and family income per unit of land;
  (2) Estimated potential contribution of the system to human and animal nutrition on/off the farm;
  (3) Estimated generation of labor per unit of land and potential return to labor of investment;
  (4) Estimated value of products returned to the farm by plant and animal residues;
  (5) Estimate of risks as compared to the traditional farming system;
(g) Estimate of input costs which will include:
  (1) Amount and value of inputs;
  (2) Technical description of the type of inputs required.

ADMINISTRATIVE ANALYSIS

CATIE

A. Organization

1. Summary History

CATIE is situated near the city of Turrialba, 70 kilometers southeast of San Jose. The valley of Turrialba was selected in 1942 as the site for the headquarters of the Inter-American Institute of Agricultural Sciences (IICA). When the General Directorate of IICA was transferred to San Jose in 1960, it maintained at Turrialba those activities initiated in 1942: training and research in agriculture, animal husbandry, and forestry.

To carry out these functions IICA created the Centro de Enseñanza e Investigación (CEI) at Turrialba. From 1960 to 1969 the training of Latin American personnel in Turrialba was strengthened and that decade saw the steady growth of IICA's Postgraduate Training Program. In 1970 CEI became the Centro Tropical de Enseñanza e Investigación (CTEI), still a part of IICA and maintaining emphasis on postgraduate training; research continued as the backstopping activity for training.

2. Creation of CATIE

On January 12, 1973, IICA and the Government of Costa Rica executed an agreement to create the Centro Agronómico Tropical de Investigación y Enseñanza (CATIE). This agreement was approved by Costa Rica's Legislative Assembly in June, 1973, and Turrialba was designated the headquarters of CATIE.

This non-profit autonomous organization, scientific and educational in nature, was created to promote and carry out research at different levels in the areas of agriculture, forestry, and animal husbandry, with the purpose of responding to the needs of the American tropics, particularly the countries of Central America and the Caribbean.

Upon establishing CATIE, its founders gave it a clear mandate to shift emphasis from teaching to research. Research was no longer to simply complement the Postgraduate Study Program but was to assume a more active role corresponding to the work carried out by national institutions in order to better respond to the perceived needs of the region's countries.

3. Current Organizational Structure

As of January 1978, CATIE's activities in the fields of research, training, and technical cooperation were reorganized into seven programs, thereby eliminating the previous departmental structure in order to give CATIE more flexibility in its new interdisciplinary research approach to solving the problems of small producers and to meeting its obligations in training and technical cooperation.

There are now three Sub-Directors immediately responsible to the Director of CATIE -- the Sub-Director for Research, the Sub-Director for Training and Technical Cooperation, and the associate Sub-Director for Administration.

The research activities under Dr. Héctor Muñoz include four programs: Annual Crops (headed by Dr. Pedro Oñoro), Perennial Plants (Dr. Gustavo Enríquez), Cattle and Small Farm Animals (Dr. Gustavo Cubillos), and Natural Renewable Resources (Dr. Gerardo Budowski). Dr. Eduado Locatelli, Sub-Director for Training and Technical Cooperation, is responsible for three programs: Post Graduate Training, Training at Other Levels, and Technical Cooperation. Mr. Gustavo Delfino, Associate Sub-Director for Administration, is responsible for five sections: finances, human resources, communications, transportation, and agricultural machinery, maintenance and general services.

The substance of CATIE's work will be carried out at the project level under the guidance of project coordinators for specific projects. Supporting units will backstop the technical work. Chart I shows an organization chart reflecting the new structure described above.

4. Activities

Chart II provides a chronology of the major research and associated activities carried out since 1944.

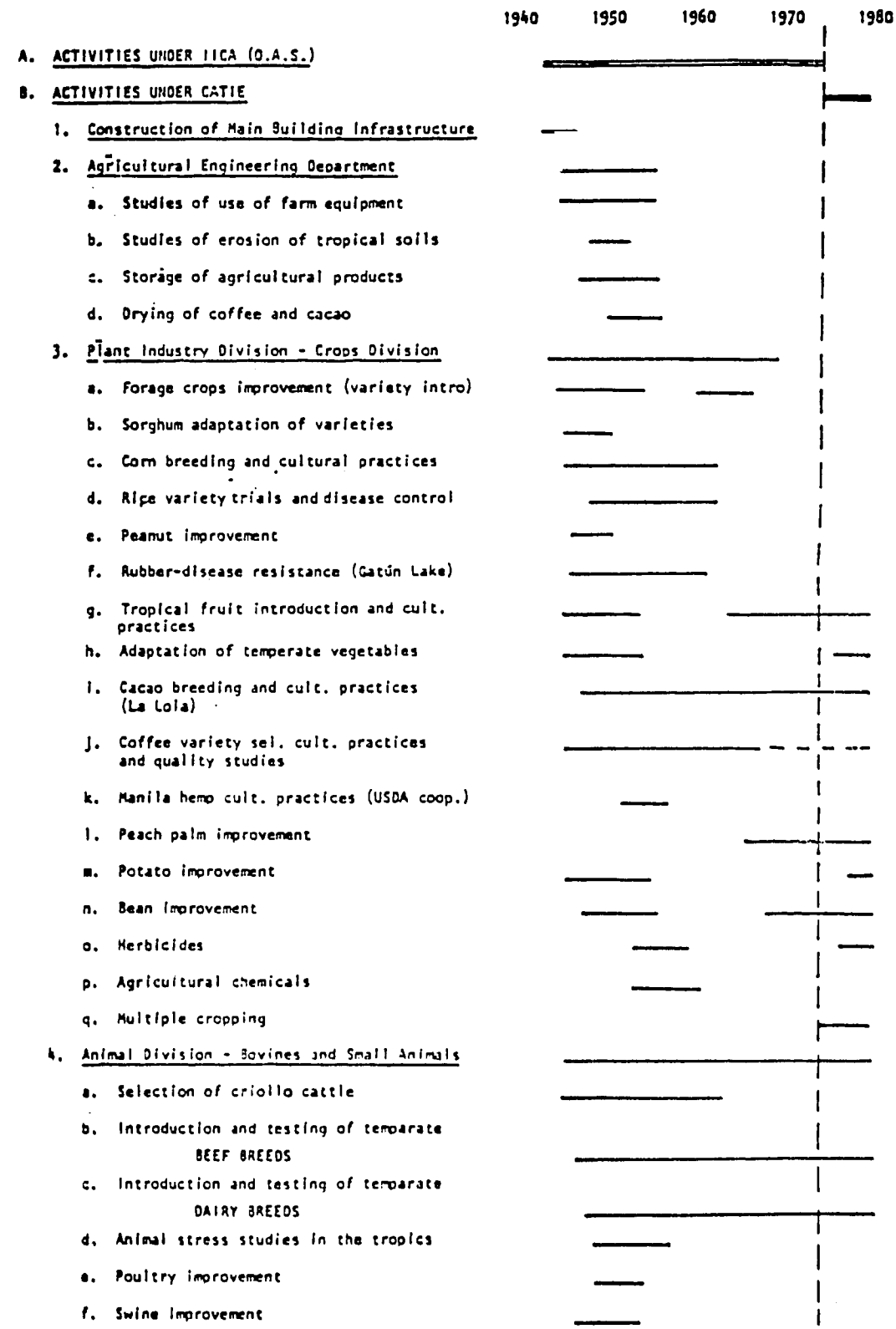
5. Organizational Relationships

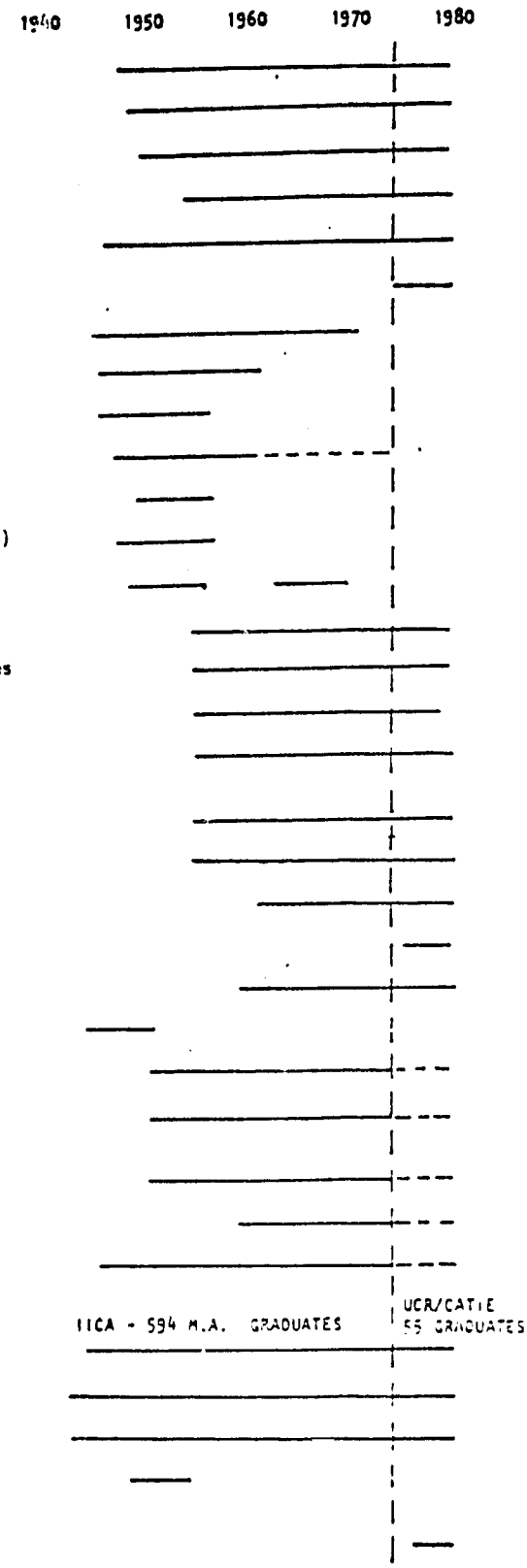
(a) Formal Agreements

While CATIE's basic core budget has remained relatively stable since the Center's inception as an autonomous unit the financial resources from external sources to carry out specific tasks have steadily grown. Collaboration from the international community has significantly increased in recent years as discussed below.

CHART I

IICA - CATIE CHRONOLOGY OF MAJOR RESEARCH AND ASSOCIATED ACTIVITIES 1944 - 1978





h. Development of dairy systems
i. Crossbreeding of dairy breeds
j. Crossbreeding of beef breeds
k. Pasture improvement studies
l. Animal feeding studies
m. Development of small farm dairy system

5. Division of Agr. Econ. and Rural Sociology
   a. Economic studies of tropical crops
   b. Economic studies of animal enterprises
   c. Rural social problems
   d. Rural human nutrition (with INCAP)
   e. Analysis of rural organization (Turrialba)
   f. Extension institutional studies

6. Forestry and Renewable Natural Resources
   a. Studies on lowland tropical forest species
   b. Economic improvement of tropical forests
   c. Selection of exotic forest species
   d. Disease and insects of forests in the tropics
   e. Forest timber characteristics
   f. Forest tree production
   g. National parks
   h. Conservation of watersheds

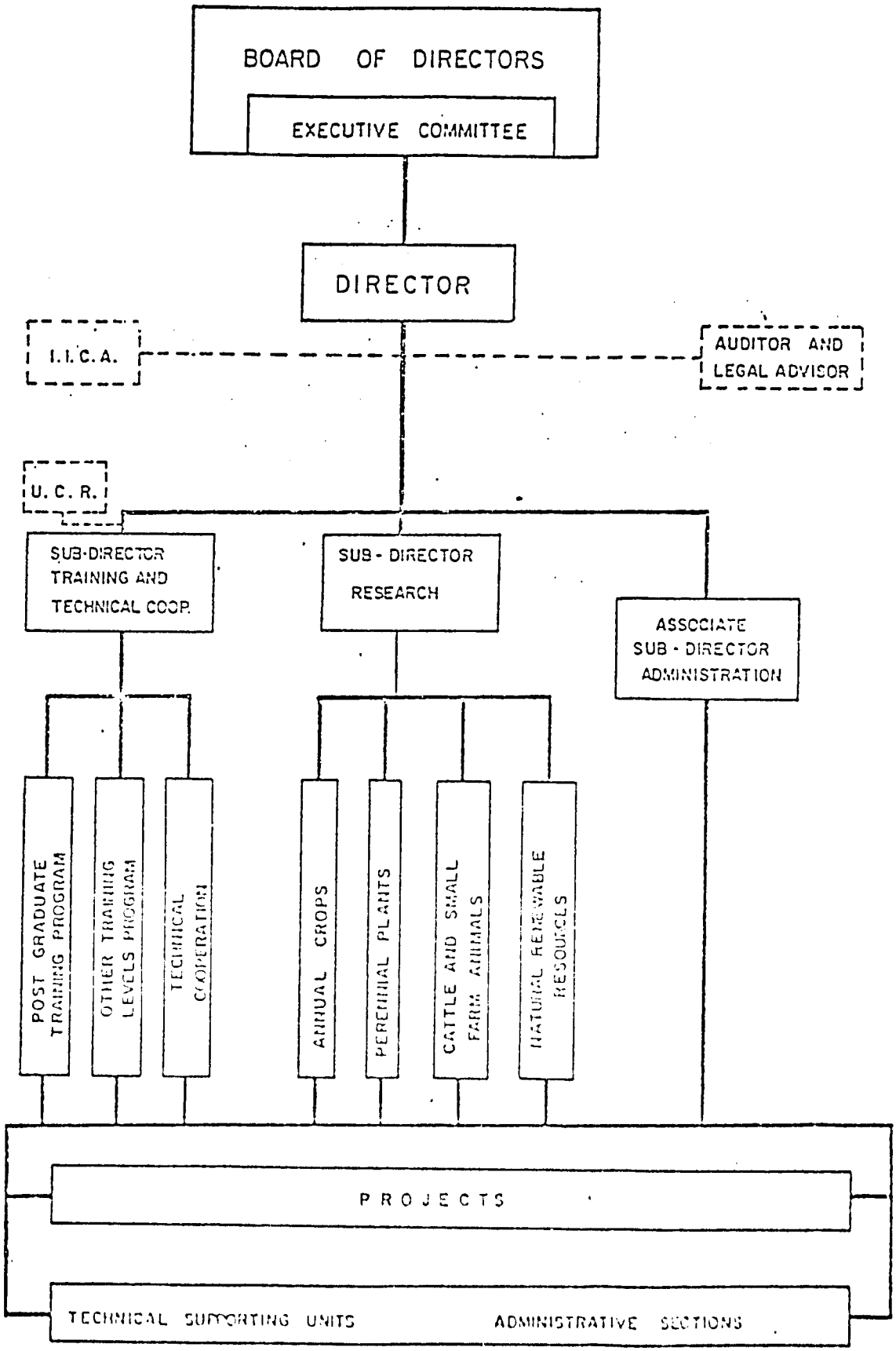
7. Interchange Information Service (1944-1950) and Scientific Communications Service
   a. Research information exchange (reprints, photocopies)
   b. Scientific publication ("Turrialba")
   c. Publication of technical books
   d. Library sciences technical assistance

8. Professional Training
   a. Magister Agriculturae degree training
   b. Short-course training
   c. Seminars and workshops
   d. Vocational training (Rockefeller/Venz. Government).
   e. Small farm cropping systems training

DF:lgj
July 26, 1978

CHART II

13a CATIE STRUCTURE



Through its Technical Cooperation Organization (GTZ), the Federal Republic of Germany is assisting a Genetic Resources Project to preserve species of high genetic value that otherwise would be lost. The project will make materials available to interested countries as alternatives to the farming system components presently in use.

The International Development Research Center (IDRC) of Canada is financing a study of the importance of agricultural byproducts in animal nutrition and is supporting research on farming systems for annual crops in Honduras and Nicaragua. Additional the IDRC is underwriting a cattle research project which CATIE developed for IDIAP (Panama). Two more projects being developed for IDRC financing will undertake research on systems for semi-arid zones and research on combined agriculture and forestry systems. The Canadian Government, through the Canadian International Development Agency (CIDA), grants fellowships to graduate students from Latin American countries.

A.I.D./ROCAP assisted CATIE in its recently concluded Soil Fertility project and is currently supporting the Small Farm Cropping Systems project which is scheduled for completion in March, 1979. These projects have enabled CATIE to extend its activities to all the Central American countries, conducting research on small farms with the cooperation and participation of national research agencies. Also AID/W, in connection with the International Plant Protection Center (IPPC) is funding a regional project on weeds and their control. Other U.S. assistance includes that of a group of young professionals from the Peace Corps who help in various projects.

With the Inter-American Institute of Agricultural Sciences (IICA), CATIE is collaborating with the French Government in the translation and adaptation of the "Tropical Agriculture Handbook". The Government of the Netherlands has assigned resident scientists to CATIE and is the main sponsor for the Postgraduate Study Program which finances fellowships for professionals from all the countries of the American Continent.

Great Britain's Minister for Overseas Development (ODM) recently visited CATIE to explore and define possible areas of cooperation and support. Provision of technicians, equipment, and fellowships are under consideration.

Work in forestry documentation was initiated in 1977 by a Swiss technician assigned to CATIE by the Government of Switzerland in connection with its Technical Cooperation Office (CTS). This collaboration includes financing for publications, equipment, and operational expenses in addition to the technical assistance.

Preliminary negotiations are underway with the Government of Japan and Israel to obtain their cooperation in soils and training respectively.

Besides the project support from the governments of the more developed countries, CATIE receives support from several international organizations. With assistance from the World Bank (through the Central Bank of Honduras), CATIE is providing technical assistance to cattle production in San Pedro Sula, Honduras, and a similar project with the Central Bank of Panama is being developed.

For many years the Organization of American States (OAS) has been granting fellowships for the Postgraduate Study Program and has sponsored short courses in specific subjects. At present the OAS contracts CATIE to do research for the rural development of western Honduras, and a similar activity is under consideration for the Atlantic Zone of Costa Rica.

In support of management and conservation of natural resources in the Central American Isthmus, agencies such as the World Wildlife Fund (WWF), the International Union for the Conservation of Nature (IUCN), the Food and Agriculture Organization of the United Nations (FAO), and the United Nations Educational, Scientific and Cultural Organization (UNESCO), have contributed to specific projects.

In joining the international network of institutions associated with the United Nations University (UNU), CATIE became the first member organization to carry out work in the area of natural resources. CATIE and the Institute of Nutrition for Central America and Panama (INCAP) are the two Central American regional centers integrated into the UNU network.

A research project currently is being developed for presentation to the Technical Advisory Committee (TAC) of the Consultative Group on International Agricultural Research (CGIAG).

A proposal for technical cooperation submitted to the Inter-American Development Bank (IDB) would encompass the six countries of the Isthmus. The proposal is now being reviewed by the IDB.

CATIE has received assistance from the Rockefeller Foundation and the Rockefeller Brothers Fund (RBF). The latter is currently backstopping a project on Management and Conservation of Wild Lands in the countries of the region. Discussions

have been initiated with the Ford Foundation and with the Kellogg Foundation for assistance in socio-economic studies and technology transfer training respectively.

In the private sector the American Cocoa Research Institute (ACRI) is supporting CATIE activities in the production of hybrid seed necessary for the expansion of cacao plantations.

(b) Informal Working Relationships

CATIE now has close ties with the International Potato Center (CIP), one of whose scientists has been assigned to CATIE since 1976 on a research project aimed at the production of potato varieties for the low humid tropics. These varieties could be of importance as alternative crops in the farming systems of the area. In April 1978, CATIE signed an agreement with CIP to establish the latter's regional office for Central America and the Caribbean with CATIE at Turrialba.

CATIE's research on farming systems has led to a regular exchange of related information with other international centers doing research in the same field. Among these are the International Rice Research Institute (IRRI), the International Institute of Tropical Agriculture(IITA), and the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT). Contact is also maintained with the Asian Vegetable Research and Development Center (AVRDC), the International Board of Plant Genetic Resources (IBPGR), and the International Fertilizer Development Center (IFDC).

CATIE also communicates with Oregon State University, the University of Florida, the University of Iowa, and the University of Kentucky on CATIE activities of interest to them.

Within the region there are several organizations with which CATIE coordinates its programming and project development and implementation. The Secretariat for Central American Economic Integration (SIECA) plays a fundamental role in the formulation, coordination, and promulgation of regional agrarian policies. With INCAP, the Central American Institute for Research and Industrial Technology (ICAITI), the Regional Organization for Plant Protection and Animal Sanitation (OIRSA), and the Central American Bank for Economic Integration (CABEI), CATIE maintains special coordinating relationships including mutual support for shared project objectives.

(c) Relationships with International Donors

The OAS, the World Bank, the United Nations Development Program (UNDP), FAO, UNESCO, UNU, IUCN, WWF, and TAC are

among the international organizations with which CATIE collaborates.

(d) Other Organizational Relationships

The policy of CATIE's Board of Directors is for CATIE to maintain cooperative and mutually-supporting linkages with other regional and international institutions engaged in activities related to CATIE's.

Three international centers for research have been created in the American Continent since 1966: one for the Improvement of Corn and Wheat (CIMMYT) in Mexico; another on Tropical Agriculture (CIAT) in Colombia; and another on Potatoes (CIP) in Peru. CATIE has established cooperative agreements with these three international centers.

Collaboration with these centers began in 1973 when CATIE turned over to CIAT its collection of bean varieties (with over 2000 entries). Jointly with CIMMYT, CATIE's corn varieties and hybrids have been tested at the farm level. Results of these tests have contributed to the Small Farm Cropping Systems project (and will be useful in the Small Farm Production Systems project). Recently CIAT stationed bean and rice specialists in the region and CATIE is coordinating research activities with them as well as with other CIAT technicians engaged in cassava and animal research.

Because of its historical association with IICA, CATIE continues to work closely with that organization. The work in research, training, and technical assistance that both institutions carry out in the Isthmus requires effective coordination to maximize the effectiveness of program implementation.

B. Infrastructure

1. Lands

CATIE's central facility covers 1,069 hectares of the Turrialba Valley, bordering the western side of the City of Turrialba. Most of this land is relatively flat. The soil lends itself to such crops as coffee, sugar cane, cacao, improved pasture, citrus and other fruit trees, vegetables, and forest trees as well as livestock. There are seven major soil series found at CATIE; Reventazón, Turay, Institute Clay, La Margot, Cervantes, Colorado, and Birrisito (as well as other miscellaneous soils). Of the total land area some 266 hectares are devoted to crop programs, 287 to animal production, and 20 to the natural renewable resources program (including forests). 396 hectares are used for residential areas, buildings, and landscaped areas (the remainder is undefined).

Some 60 kilometers from Turrialba, between Siquirres and Port Limón on the Atlantic slope of Costa Rica, CATIE has another farm, "La Lola", 102 hectares in size. The climate there is warm and humid with an annual average temperature of 25°centigrade and average annual rainfall of 3500 millimeters. The original vegetation of the area was wet tropical forest. Presently it is dedicated principally to research in the production of cacao hybrid seed and the commercial exploitation of cacao. Some combined agriculture and forestry studies also are being undertaken at the La Lola facility.

2. Buildings and Facilities

CATIE's main facilities include four office buildings, a conference hall and other meeting rooms, classrooms, and teaching laboratories. Also there are laboratories and facilities for activities in soils, plant physiology, entomology, plant pathology, animal nutrition and physiology, wood technology, computer technology, and languages. The Center has 13 greenhouses, a herbarium, two cold chambers for genetic materials, and arboretum, nurseries, and a meteorological station.

Added since the creation of CATIE have been a building for the Cattle and Small Animals Program and one for the soils laboratory, a cold changer for genetic resources, an apartment building to house visiting scientists, an enlarged potable water supply with an internal system, and facilities for drying and processing cacao seeds. Most of these works have been accomplished with funds deriving from the sale of lands.

The Orton Memorial Library was retained by IICA upon the creation of CATIE but is still located in Turrialba, serving the region's countries as well as technicians and students at CATIE. The library is under the administration of IICA's Inter-American Center for Agricultural Documentation and Information (CIDIA). This library, reputedly the finest agricultural library in Latin America, houses 60,000 volumes, 2300 titles of periodicals, and 110 titles of bibliographical indexes and abstracts.

Other CATIE facilities include three dormitores for bachelor students, 11 apartments for married students, one guest house, one apartment building for visiting scientists, 48 residences for technicians, a cafeteria, a recreation center with swimming pool and sports areas, and two school buildings, one for an alementary school and the other for a kindergarten.

3. Equipment

All laboratories are adequately equipped for requisite research and teaching (the modern soils laboratory has a capacity

for analyzing 200 soil samples daily).

CATIE maintains a motor pool of some 44 vehicles (buses, jeeps, carryalls, microbuses, sedans, trucks). It has carpenter and automobile repair shops and a fueling station. It also is equipped with agricultural machinery including tractors, a D4 bulldozer, a loader, and spray equipment for the commercial farm operation (coffee and sugar cane).

The dairy farm has a mechanical milking facility and operates a creamery.

Center equipment includes also a Hewlitt-Packard Computer for processing experimental data. The conference room is equipped with slide and film projectors as well as an opaque projector.

3. Professional Staff

Attached is the professional staff list of CATIE personnel, as well as the job descriptions of the senior and junior professional staff to be employed under the proposed project.

PROFESSIONAL STAFF LIST

Name:	Nationality:	Position:
GENERAL ADMINISTRATION		
Fonseca, Santiago (Ph.D.)	Colombian	Director
Muñoz, Héctor (Ph.D.)	Mexican	Sub-Director of CATIE for Research
Locatelli, Eduardo (Ph.D.)	Uruguayan	Sub-Director of CATIE for Training and Technical Cooperation
Leon-Velarde, Carlos (M.S.)	Peruvian	Training Specialist, Assistant to Locatelli
Delfino, Gustavo	Uruguayan	Associate Sub-Director of CATIE for Administration
Erickson, Arnold (M.S.)	U.S.A.	In Charge, Public Relations Office
ANNUAL CROPS AND PERENNIAL PLANTS PROGRAMS		
1/ Arze, José Agustín (M.S.)	Peruvian	Specialist in Cropping Systems (El Salvador)
Bazán, Rufo (Ph.D.)	Bolivian	Soil Scientist
1/ Bejarano, Washington M.S.	Ecuadorian	Specialist in Soil Fertility (Consultant).
1/ Boynton, Damon (Ph.D.)	U.S.A.	Consultant in Documentation
1/ Burgos, Carlos (Ph.D.)	Salvadorean	Agronomist, Specialist in Soil Management
1/ De Lucía, Gualberto (Ph.D.)	Uruguayan	Specialist in Production Systems (Honduras)

1/ Agreement between CATIE/ROCAP

	Name:	Nationality:	Position:
1/	Díaz-Romeu, Roberto (Mag. Agr.)	Guatemalan	Head, Soils Laboratory, CATIE/ROCAP Soil Fertility Project
2/	Engels, Johannes (Ing. Agr.)	Netherlands	Specialist in Genetic Resources
	Enríquez, Gustavo (Ph.D)	Ecuadorian	Specialist in Agronomy Head, Perennial Plants Program
	Fargas, José (Ph.D.)	Ecuadorian	Plant Physiologist
2/	Goldbach, Heiner (Ph.D.)	German	Seed Physiologist
	Hart, Robert (Ph.D.)	U.S.A.	Agronomist, Production Systems
1/	Holle, Miguel (Ph.D.)	Peruvian	Horticulturist
3/	Jackson, Michael (Ph.D.)	British	Potato Production Specialist
1/	Jiménez Saa, Humberto (M.S.)	Colombian	Specialist in Communication
1/	Kass, Donald (Ph.D.)	U.S.A.	Agron. Specialist in Cropping Systems (Guatemala)
4/	King,Andrew B.S. (Ph.D.)	British	Entomologist
2/	León, Jorge (Ph.D.)	Costarrican	Head, Genetic Resources Bank of Cultivated Plants
5/	Locatelli, Eduardo (Ph.D.)	Uruguayan	Specialist in Tropical Weed Control and Sub-Director (Training and Tech Coop)
	Meneses, Roger (Ing. Agr.)	Costarrican	Specialist in Management of Production Systems
	Moreno, Raúl (Ph.D.)	Chilean	Plant Pathologist
1/	Navarro, Luis (Ph.D.)	Chilean	Agricultural Economist

1/ Agreement between CATIE/ROCAP 2/ Agreement between CATIE/GTZ

3/ Agreement between CATIE/CIP 4/ Agreement between CATIE/ODM (British Gov't)

5/ Agreement between CATIE/Oregon State University.

Name:	Nationality:	Position:
1/ Oñoro, Pedro (Ph.D.)	Colombian	Biometrician, Head, Annual Crops Program
1/ Palencia, Aníbal (M.S.)	Guatemalan	Agronomist, Specialist in Soil Fertility, Nicaragua
6/ Paredes, Alfredo (Agr.)	Ecuadorian	Assistant Horticulturist
1/ Saunders, Joseph (Ph.D.)	U.S.A.	Entomologist
5/ Shenk, Myron (M.S.)	U.S.A.	Specialist in Tropical Weed Control
Sylvain, Pierre G. (Ph.D.)	Haitian	"Horticulturist Emeritus"

CATTLE AND SMALL FARM ANIMALS PROGRAM

7/ Avila, Marcelino	Belize	Agricultural Economist
Cubillos, Gustavo (Ph.D.)	Chilean	Agrostologist, Program Head
Deaton, Oliver (Ph.D.)	U.S.A.	Specialist in Animal Production
Fuentes, Luis Guillermo (Ing. Agr.)	Costarrican	Farm Foreman
8/ García, Jorge Luis (M.S.)	Peruvian	Economist, Specialist in Business Management
13/ Li Pun, Héctor (Ph.D.)	Peruvian	Advisor in Animal Production (Panamá)
Moreno, Alberto (M.S.)	Argentinian	Technical Assistant (Coto Brus)
7/ Pezo, Danilo (M.S.)	Peruvian	Research Assistant
8/ Pineda, Jaime (Ph.D.)	Colombian	Specialist in Cattle Breeding and Production (San Pedro Sula Honduras).

1/ Agreement between CATIE/ROCAP
5/ Agreement between CATIE/Oregon St. Univ.
6/ Agreement between CATIE/ACRI
7/ Agreement between CATIE/IDRC-Canada
8/ Agreement between CATIE/Central Bank of Honduras
13/ CATIE/IICA/MIDA-Panamá

Name:	Nationality:	Position:
Quijandría, Benjamín (Ph.D.)	Peruvian	
8/ Ramírez, Alberto (M.S.)	Colombian	Specialist in Animal Production and Forage Production and Utilization, San Pedro Sula Honduras
Romero, Francisco (M.S.)	Costarican	Technical Assistant (Río Frío)
7/ Ruiz, Arnoldo (M.S.)	Costarican	Research Assistant
Ruiz, Manuel (Ph.D.)	Peruvian	Nutritionist
Villegas, Luis (M.S.)	Costarican	Technical Assistant (Río Frío)
Vohnout, Karel (Ph.D.)	Ecuadorian	Nutritionist

NATURAL RENEWABLE RESOURCES PROGRAM

Budowski, Gerardo (Ph.D.)	Venezuelan	Forester (Ecology, Silviculture, Land Use, Conservation,) Program Head
14/ Combe, Jean (Ing.)	Swiss	Silviculturist and Specialist in Agro-Silvo-Pastoral Systems
10/ De San Román, Manuel (Ing.Quim)	Costarican	Wood Technologist
4/ Dyson, William (Ph.D.)	British	Specialist in Fast Growing Species
10/ Gewald, Nico Jan (Ing. For.)	Netherlands	Specialist in Silviculture
11/ González, Guillermo (M.S.)	Costarican	In charge of Laboratory of Woods

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4/ Agreement between CATIE/ODM (British Government)

7/ Agreement between CATIE/IDRC-Canada

8/ Agreement between CATIE/Central Bank of Honduras

10/ Agreement between CATIE/Netherland Government

11/ Agreement between CATIE/ University of Costa Rica (UCR)/MAG.

14/ Swiss Technical Cooperation.

12/	Hudson, John (B.S.)	British	Specialist in Forest Protection, Control of Forest Fires, Residence in Siguatepeque, Honduras
	MacFarland, Craig (M.A.)	U.S.A.	Specialist in Management of Wildlands
11/	Ramírez, Aldo (I.C.)	Costarican	Specialist in Wood Technology
	Rosero, Pablo (Mag. Agr.)	Ecuadorian	Forester, Forest Management

11/ Agreement between CATIE/Univeristy of Costa Rica (UCR)/MAG.

12/ Agreement between CATIE/ODM (British Government).

JOB DESCRIPTIONS

A. Senior Professional Staff

General

Senior professional staff members should hold the degree of Ph.D. or the degree of MSc. with exceptional capability in his speciality. They should have good command of the Spanish language. They should have had considerable experience in agricultural field work in LSDS, and should have an appreciation of and a commitment to the essential need for interdisciplinary planning, execution and analysis of crop and animal research, not only within the CATIE project group, but also in collaboration with the technical personnel of cooperating institutions. A major part of the activities of the senior professional staff will be in target areas of the six co-operating countries.

Project Leader (Senior Agronomist)

The Project Leader will have responsibility for the overall co-ordination of the planning, management and analysis of the crop, animal and mixed farming systems research work of the project. He will be directly responsible to the Sub-Director of Research, and will conduct his activities in close association with the heads of the crop and animal programs. The project coordinators in the two programs will be responsible to him for the day-to-day planning and conduct of field work, and for the gathering and analysis of research information by the technical personnel in their programs. The project leader will work with the appropriate administrative officers of collaborating national institutions in developing a maximum of participation by technical personnel in implementation of the project at the national level. He will devote his attention principally to Outputs 1 and 2 (Recommendations and Methodology) but will also provide leadership in the coordination of these activities with these of Outputs 3 and 4 (Information Transfer and Training).

Agricultural Economist (Farm Management)

The Agricultural Economist will have overall responsibility for the farm management research of the project, serving as a member of interdisciplinary teams for design, conduct and analysis of the field research and providing economic expertise on the aspects of input-output and cost-benefit, measured both in monetary terms and in terms of resource productivity and family well-being. He will be principally involved in Outputs 1 and 2 but will also take part as needed in work of Outputs 3 and 4.

Horticulturist (Vegetable Crops)

The Horticulturist will have responsibility for the characterization of the vegetable and basic food crops encompassed by the project, in terms of their agro-climatic, biotic and soil adaptabilities and, as a member of inter-disciplinary teams, for the planning, execution and analysis of farming systems trials and experiments in which vegetables are included. Most of his time will be spent in activities of Outputs 1 and 2 but he will also contribute as needed to work of Outputs 3 and 4.

Agronomist (Crop Physiology)

The Crop Physiology Agronomist will take the leadership in planning, execution and analysis of trials and experiements which measure the effects of plant competition, light temperature, nutrient level and water availability on the growth and yield of crops in different cropping and mixed crop-animal systems. He will be involved more with Outputs 1 and 2 than 3 and 4 but will participate in activities of all four.

Pest Management Specialist (Crops)

The Pest Management Specialist will have overall responsibility for the assessment of pest management problems in the target areas of the six countries, for the continuing development of a manual to guide the resident agronomists and the national technical personnel in low-input control measures, and in the conduct of field tests and experiements with insect control measures in the cropping systems under investigation by the inter-disciplinary teams. He will be most deeply involved in work under Outputs 1 and 2 but will cooperate in that under Outputs 3 and 4.

Resident Agronomists for the Six Countries

The six resident agronomists will have primary responsibility for the day-to-day management of the project trials and experiments in their respective countries of assignment. They will work in full cooperation with the national technical personnel of the collaborating national institutions. They will be the point of contact between the CATIE project staff resident at Turrialba and the national technical personnel, developing annual work plans which involve the Turrialba-based staff in the trials and experiments of the project. They will set up meetings at the national level to discuss results and to make plans, as well as to take part in the regional results and planning conferences. They will be deeply involved in the work concerned with all four Outputs, collaborating in organization of the initial studies and the test demonstrations carried on under Output 3 (Information Transfer) and in the selection and follow-up of national technical staff for Output 4 (Training). Their activities in helping to coordinate the cropping, mixed crop-animal, and animal systems work will be carried on at the national level with the cooperation

of the Animal Research Project Representative working in their country.

Small Animal Specialist

The Small Animal Specialist will have overall responsibility for the animal production systems research coordination in the project, with the technical support of CATIE staff and short-term consultants with specialists in small and large animals, pastures, and animal nutrition. Under the leadership of the Project Leader, he will collaborate with the cropping systems coordinator in the planning, execution and analysis of the research work in mixed crop-animal systems. In turn, he will provide leadership in the conduct of initial surveys by the Animal Research Project Representatives for the collaborating countries, and will assure effective cooperation with the appropriate institutions in those countries. His principal concentration will be on activities related to Outputs 1 and 4 in the first year. In the subsequent years his involvement with Outputs 2 and 3 will become more important.

Agricultural Economist (Farm Management and Marketing)

The Agricultural Economist will cooperate with the Farm Management Economist of the Cropping Systems group in formulating and carrying on baseline economic studies of Small Farmer Production Systems including animals in the target areas agreed upon, and on other farm management research within the farming systems trials and experiements. In addition he will take the leadership in local and regional market analysis. His activities will be largely concentrated in Output 1, but he will take part in work under Outputs 2, 3 and 4 as needed.

Veterinarian

The Veterinarian will have general responsibility for assessing the animal disease and parasite problems of large and small animals, including poultry, in the target areas of the project. He will take part in the formulation and conduct of regional baseline surveys, as a member of the project teams, and will make recommendations on animal sanitation practices in the target areas and will cooperate with the animal team members in studying their economic impact.

Animal Research Project Representatives for the Six Countries

Three animal research project representatives will provide CATIE leadership for the animal systems work, at the national level, in the six countries: 1 for Costa Rica and Panama, 1 for Nicaragua and Honduras and 1 for El Salvador and Guatemala. The subject specialties of swine and poultry nutrition, pasture management and forage utilization, and cattle management will be covered by these representatives, as part of the animal systems research team. The representatives will cooperate

with the CATIE resident agronomists in all activities including the conduct of baseline surveys and field trials and experiments of mutual concern. In addition, they will serve in the same capacity as the resident agronomists to develop close cooperation with national technical personnel, as point of contact between national personnel and CATIE project staff, in the planning of work and analysis of results at the national level, and in the management of the field work and training programs related to animals. They will be involved importantly in all activities concerned with four Outputs.

Rural Development Agricultural Information Specialist

The Agricultural Information Specialist will have responsibility for providing leadership in all aspects of the information transfer component of the project. He will take charge of the assessment of national institutional capabilities to transfer systems based technological packages to small farmers (phase 1) and will have leadership in the development of test demonstrations of appropriate information transfer systems for selected tech-packs (stage 2) and in the analysis of the results. He will work with and receive the cooperation of the CATIE resident representatives in the countries as well as the CATIE center staff, and will take personal charge of the arrangements for institutional cooperation in the work at the national level.

B. Junior Professional Staff

Professional Field and Laboratory Assistants

The professional field assistants for the countries will carry on their work under the direction of the resident agronomist and/or appropriate animal research project representative. Their function is to assume responsibility by delegation of part of the field work of the CATIE senior resident. They may take the form of organizing and managing field surveys, supervising and managing field trials and experiments, conducting meetings and training programs, analyzing and reporting results, etc. Most of their work will be carried on at the target areas of the project and they will be principally involved with Output 1 but will contribute to Outputs 2, 3 and 4 as needed.

The professional field and laboratory assistants assigned to CATIE resident staff will be under the direction of specific specialists, and will carry on their work by delegation of responsibility from that person. Some of their work will be carried on at CATIE to provide continuity of research activity in the absence of their superior, and some may be done in the national target areas. They will have the same kinds of responsibilities as those assigned to countries. Their work will be principally concerned with Output 1, but they may contribute to the other three Outputs if needed.

Data Management Officer

The Data Management Officer will be responsible for the continuous banking and processing of pertinent secondary data and primary data from external sources and from project surveys, trials and experiments in the target areas. He will develop and maintain an efficient system of receipt, banking, retrieval and processing by program determined by the biometrician-statistician, placing the processed data in the hands of the appropriate specialists within a reasonable lapse of time. He will work under the direction of the project leader and in cooperation with the biometrician.

Documentation Officer

The Documentation Officer will have responsibility for the acquisition, cataloguing, retrieval, reproduction and dissemination of publications and documents needed by the project staff and cooperating national technical personnel. He will cooperate with PIADIC and CIDIA in providing them with materials and titles, and will cooperate with the documentation officers on the international centers in the exchange of materials and bibliographical materials. His services will contribute to all of the four Outputs.

Rural Social Anthropologist

The Rural Social Anthropologist will take major responsibility for the Phase 1 field activities in the Information Transfer (Output 3) component, as well as in the baseline surveys in the target areas of the countries, working with an inter-disciplinary team and with assigned technical personnel of the national institutions. He will be needed during the first two years of the project and will be concerned mostly with Output 3, but also will contribute to Outputs 1 and 2.

Initial Environmental Examination

Project Title:	Small Farmer Production Systems
Project Location:	Central America
Project Number:	596-0083
Funding	$7.4 million (Grant)
Life of the Project	FY 79-83
IEE Prepared by:	Alejandro Sundermann Date: December 20, 1978

Recommended Threshold Decision: Negative Determination

Mission Director's Concurrence:

Harry Ackerman, Director

Date: Dec. 27, 1978

SMALL FARMER PRODUCTION SYSTEMS

INITIAL ENVIRONMENTAL EXAMINATION

I. Project Description

The project is a follow-on to successful work performed by the Tropical Agricultural Research and Training Center (CATIE) in Costa Rica over the past four years under a previous ROCAP project in the field of intercropping research and development of multidisciplinary small farmer production recommendations for on-farm use. Using the experience gained to date, CATIE will significantly expand its research efforts under the proposed project to incorporate a complete farming systems research approach, i.e., take into account the physical environment and socio-economic conditions in the design of appropriate alternative production systems (including crops, animals, and mixed farming). The project, to begin in 1979 for a four and one-half year period, will include studies and research by CATIE in coordination with the national research institutions of Central America to: 1) identify agricultural production systems used by small farmers, characterize the ecological, climatic, and sound economic factors in small farmer regions, and identify factors limiting production; 2) develop improvements to traditional systems used by small farmers to increase the productivity of the land through improved cropping, animal production and mixed systems which optimize and conserve the resources available; 3) develop the means by which small farmers will use the improved systems; 4) train national technical personnel to conduct multidisciplinary research; and 5) develop a coordinated focus of research at the national level and coordination of activities in all the Central American countries. The major output of the project will be tested and tried recommendations for new small farm crop-animal options which will improve management practices in terms of yield or net income in comparison with traditional systems.

II. Environmental Aspects

A. Direct Environmental Impacts

The project consists of research for the design of economically and environmentally sound integrated small farm agricultural management and production systems. Thus the controlled experimentation to be undertaken is not expected to have any significant direct environmental impact.

The project will include development of techniques in-

volving the use of pesticides. However, the research to be conducted will be oriented towards minimizing their use, and only when absolutely necessary, by utilizing cultural, physical and mechanical control methods to the maximum extent possible. This activity is in accordance with AID's Policy on Pesticide Support to give special consideration to and establish programs aimed at designing and operating sound pest management systems and to promote alternative methods which do not depend on the use of persistent pesticides. The use or application of pesticides under the project will be conducted under strict controls to safeguard the health of research personnel and the ultimate user of the recommendations developed, as well as the quality of the local environment.

Since the proposed project is basically a research activity, the AID Pesticide Procedures and Pesticide Procurement Policies do not apply as per paragraph 216.3(b)(2) (iii) of Regulation 16 and paragraph 4C4d(7), respectively.

B. Indirect Environmental Impacts

Since the project research activity will be focussed to improve and promote the rational use of available economic and natural resources available to small farmers, it is expected that the project will have a positive environmental impact in the long run. The recommended farming systems to be developed, and dissemination and use thereof, are expected to increase the productivity of small farmers within their current cultural and socio-economic environment with the goal of increasing their income and quality of life. The acceptance and use by small farmers of the production systems developed under the project will determine the magnitude and extension of the expected indirect positive environmental impact.

III. Conclusions and Recommendations

From the description and scope of the project and based on the following Discussion of Impacts and above summary of impact considerations, it is determined that the project will not have a significant direct effect on the environment. The application or use of the resulting improved production management systems by the ultimate user, the small farmer, is expected to result in improved soil conservation, rational use of pesticides, and positive changes in the socio-economic environment of the rural poor.

A negative determination is therefore recommended for this project.

SMALL FARM PRODUCTION SYSTEMS

Initial Environmental Examination

Discussion of Impacts

The following are the reasonable forseeable impacts on the environment as a result of the project:

Land Use

Research under the project is expected to result in recommendations for selected combinations of annual and perennial crops, pastures, and animals in the form of an integrated system whose mutually reinforcing elements contribute to soil conservation. This is expected to improve small farmer use and productivity of the land already under cultivation.

Water Quality and Atmospheric

The current contamination of surface or ground water, and the atmosphere, by the use and spraying of pesticides is expected to be reduced through the proposed research leading to recommendations for rational pesticide use and/or alternative pest control measures. Thus the project is expected to promote the reduction of air and water contamination by pesticides.

Cultural and Socioeconomic

The new recommended agricultural production systems to be developed under the project and dissemination and use thereof are expected to result in increased rural productivity and income. The new systems will be adapted to the existing cultural patterns and institutional structures, with an expected positive bearing on the standards and quality of life of the small farmer.

Health

The research to be conducted under the project will address rural family nutrition. The expected new production systems will include recommended cropping patterns to increase the planting of alternative and more nutritious food crops acceptable to existing cultural patterns.

Checklist for Environmental Impact Identification and Evaluation

Legend:

N/A = Not applicable to proposed project
N = No environmental impact
L = Little environmental impact
M = Moderate environmental impact
H = High environmental impact
U = Unknown environmental impact

Impact Area	Level of Impact
A. Land Use	
1. Changing the character of the land through:	
a. Increasing the population	N
b. Extracting natural resources	N
c. Land clearing	N
d. Changing soil character	M+
2. Altering natural defenses	N
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
B. Water Quality	
1. Physical state of water	N
2. Chemical and biological states	M+
3. Ecological balance	N
C. Atmospheric	
1. Air additives	M+
2. Air pollution	M+
3. Noise pollution	N
D. Natural Resources	
1. Diversion, altered use of water	N
2. Irreversible, inefficient commitments	N
E. Cultural	
1. Altering physical symbols	N
2. Dilution of cultural traditions	L
3. Social organization	N
4. Institutional structures	L
5. Quality of life	M+

F. Socioeconomic

1. Changes in economic/employment patterns....	M+
2. Changes in population.....	N
3. Changes in cultural patterns.....	M+
4. Changes in agricultural practices.....	M+

G. Health

1. Changing a natural environment.....	N
2. Eliminating an ecosystem element.....	N
3. Nutrition.....	M+

H. General

1. International impacts.....	N
2. Controversial impacts.....	N
3. Larger program impacts.....	N

I. Other Possible Impacts

1. Environmental consequence of system failure	N

FINANCIAL ANALYSIS 0 IICA/PIADIC (Project 596-004-)

This Annex contains:

1. IICA Revenue Trend Analysis
2. Expenditure Schedule
3. Budget Commentary

An analysis of IICA's financial statements is on file at ROCAP.

1. IICA

REVENUE TREND ANALYSIS

IICA has shown a consistent growth in revenues from member countries as shown in the following table:

Year	Country Quotas Amount (US $000)	% Increase over 1973
1973 Base Year)	$4,779	N/A
1974	$5,540	16%
1975	$6,321	24%
1976	$7,064	32%
1977	$8,191	71%

Exhibit 1, statements of income, expenditures and changes in general working fund, shows that member country quotas accounted for 93%, 99%, 99%, 99%, and 99% of total revenues to this fund during fiscal years 1973 through 1977 respectively.

In addition to the general working fund, IICA administers three other categories of funds as follows: Special Funds, Simon Bolivar Fund and National Funds. A brief description of each fund follows:

Special Funds are those funds established in accordance with agreements, contracts and grants with various institutions or member states for specific purposes. The Simon Bolivar Fund is a voluntary fund created to promote the activities of the Institute toward accelerating the agricultural and rural development of Latin America and the Caribbean. It is principally funded by a special contribution from Venezuela. National Funds, the third class of funds administered by IICA, are related to certain contracts and agreements with institutions or governments of member countries. These funds are deposited in special bank accounts and all receipts and expenditures are separately recorded.

The following table shows the volume of activity associated with these funds during the past four years and the percentage increase over base year 1974.

(U.S. $000)

Year	Receipts Amount	Receipts % Increase	Expenditures Amount	Expenditures % Increase
1974 (Base Year)	$2,160	N/A	$2,266	N/A
1975	3,242	50%	2,556	13%
1976	5,083	135%	3,812	68%
1977	5,355	148%	5,333	135%
Totals	$15,840		$13,967	

If General Working Fund receipts and expenditures are added to the above receipts and expenditures, a total level for IICA's operations can be established. The table below reflects such a consolidation along with percentage growth in activities using 1974 levels as the base.

(U.S. $000)

	1974 (Base Yr)	1975	1976	1977	Totals
Working Fund Receipts	$5,552	$6,322	$7,072	$8,195	$27,141
All other Funds' receipts	2,160	3,242	5,083	5,355	15,840
Total receipts	$7,712	$9,564	$12,155	$13,550	$42,981
% Increase	N/A	24%	58%	76%	
Working Fund Expenditures	5,602	6,642	7,235	8,063	27,542
All other Funds' Expenditures	2,266	2,556	3,812	5,333	13,967
Total expenditures	$7,868	$9,198	$11,047	$13,396	$41,509
% Increase	N/A	17%	40%	70%	

The above table reveals very clearly that member countries' support to, and demand for IICA's services have increased dramatically over the past three years.

Exhibit 1 shows that for the five years being reviewed, IICA has sustained an operating loss of $227,000 or an average of $45,000 per year. This figure tends to be overstated because IICA follows the practice of expensing all purchases of furnishings and equipment instead of capitalizing and depreciating them over their estimated useful lives. The result is that IICA's financial statements do not reflect the historical value of depreciable assets, and expenses each year are inflated by the net of capital items purchased less current year depreciation on those items. If IICA followed the practice of capitalizing items whose useful lives exceeded one year, they would undoubtedly have shown an overall surplus instead of a deficit for the five-year period.

In conclusion, IICA's revenues reflect a constant pattern of growth tied to healthy increases in member countries' contributions and demand for IICA's services.

EXHIBIT I

INTER-AMERICAN INSTITUTE OF AGRICULTURAL SCIENCES (IICA)

STATEMENTS OF INCOME, EXPENDITURES AND CHANGES IN GENERAL WORKING FUND

(US $000)

	Year Ended June 30,				
	1973	1974	1975	1976	1977
INCOME:					
Income Budgeted from Quotas of Member Countries 1/	$4,779	$5,540	$6,321	$7,064	$8,191
Unbudgeted Quotas From New Members of the Institute 1/	202	11	--	2	1
Other Income	392	1	1	6	3
Total Income	$5,373	$5,552	$6,322	$7,072	$8,195
EXPENDITURES:					
Budgeted Expenditures	$4,597	$5,436	$6,307	$6,745	$8,063
Expenditures Resulting From Special Resolutions	602	166	335	490	--
Total Expenditures	$5,199	$5,602	$6,642	$7,235	$8,063
Excess of Income (Expenditures)	$ 174	($ 50)	($ 320)	($ 163)	$ 132
Appropriation to General Working Fund	65	65	65	16	40
	$ 239	$ 15	($ 255)	($ 147)	$ 172
General Working Fund - Beginning Balance	$2,803	$3,042	$3,057	$2,802	$2,655
General Working Fund - Ending Balance	$3,042	$3,057	$2,802	$2,655	$2,827

Note: 1/ See Exhibit II

EXHIBIT II

INTERAMERICAN INSTITUTE OF AGRICULTURAL SCIENCES (IICA)
ORGANIZATION OF AMERICAN STATES - REGULAR FUND - MEMBER STATES QUOTAS
For the Years Ended June 30, 1975, 1976 and 1977
(US $000)

	FYE 6/30/77		FYE 6/30/76		FYE 6/30/75		FYE 6/30/74	
	Amount	%	Amount	%	Amount	%	Amount	%
Argentina	572	6.9%	493	6.9%	442	7.0%	365	6.6%
Barbados	6	---	---	---	---	---	---	---
Bolivia	15	.2	13	.2	11	.2	17	.3
Brazil	572	6.9	498	7.0	446	7.0	343	6.2
Canada	525	6.4	452	6.4	405	6.4	356	6.4
Colombia	119	1.5	104	1.5	93	1.4	82	1.5
Centro America and Panama:								
Costa Rica	15	.2	13	.2	11	.2	17	.3
El Salvador	15	.2	13	.2	11	.2	17	.3
Guatemala	22	.3	19	.3	17	.3	22	.4
Honduras	15	.2	13	.2	11	.2	17	.3
Nicaragua	15	.2	13	.2	11	.2	17	.3
Panama	15	.2	13	.2	11	.2	17	.3
Chile	104	1.3	91	1.3	82	1.2	85	1.5
Dominican Republic	15	.2	12	.1	11	.2	17	.3
Ecuador	15	.2	13	.2	11	.2	17	.3
Guyana	14	.2	13	.2	12	.2	11	.2
Haiti	14	.2	13	.2	12	.2	17	.3
Jamaica	14	.2	13	.2	12	.2	17	.3
Mexico	639	7.8	557	7.9	499	7.9	377	6.8
Paraguay	14	.2	12	.1	12	.2	17	.3
Perú	52	.6	45	.6	41	.6	42	.8
Trinidad Tobago	15	.2	--	--	--	--	--	--
United States	5,106	62.3	4,405	62.4	3,939	62.3	3,475	62.6
Uruguay	45	.5	39	.6	35	.6	30	.5
Venezuela	238	2.9	207	2.9	186	2.9	176	3.2
Total Quotas	$8,191	100.0%	$7,064	100.0%	$6,321	100.0%	$5,551	100.0%
Total Collections (Includes Prior Years)	$8,603		$6,361		$6,691		$5,710	

2. EXPENDITURE SCHEDULE

April, 1979 through June 30, 1981

(27 Months)

AID CONTRIBUTION

	ROCAP Procurement	FY 79[2]		FY 80[3]		FY 81[4]		TOTAL	
		MM	$000	MM	$000	MM	$000	MM	$000
	Technical Assistance								
	Long Term (PASA)								
1.	Principal Advisor/ROCAP Project Manager (Murphrey)	8	48	13	78	6	36	27	162
2.	Agr./Rural Sector Statistics-Spec. (Area Frame Sampling) (Wallace)	9.5	57	13	78	5	30	27.5	165
3.	Bio/Agronomist (Crop Prod./Mkt Data Spec. (To be recruited)	-0-	-0-[1]	12	72	5	30	17	102
4.	Agricultural Information/technology Spec (McColaugh)	8	48	13	78	5	30	26	156
5.	Short Term	10	50	8	40	2	10	20	100[5]
	Subtotal	35.5	203	59	346	23	136	117.5	685
	IICA Procurement (Local Contracts)								
1.	Ag Statistics/Area Frame - Sampling Spec.	8		13		2		23	
2.	Ag. Climatologist data Spec.	8		13		2		23	
3.	Soil-Water Data Spec.	8		13		2		23	
4.	Ag Research data Spec.	8		13		2		23	
5.	Ag. Econ.-Farm Mgt. Spec.	8		13		2		23	
6.	Rural Sociologist	8		13		2		23	
7.	Rural Anthropologist	8		13		2		23	
8.	Info Centers/Network Spec.	8		13		2		23	
	Subtotal	64	77	104	125	16	19	184	221

5/ Approx. 2/3 of the short term technical assistance budget will be used in support of developing and using the Area Sampling Frame.

		FY 79		FY 80		FY 81		TOTAL	
		MM	$000	MM	$000	MM	$000	MM	$000
	IICA Procurement								
9.	Travel and Per Diem		45		70		10		125
10.	Training, meetings, techn. exchange		45		70		30		145
11.	National Surveys and Studies add-ons in Biology/Production Technology & Socio/Economic level of life indication data		70		80		0		150
12.	Short-Term Contracts		20		32		5		57
13.	Evaluations		5		5		5		15
14.	Commodities		15		0		0		15
15.	Supplies and materials		20		30		5		55
	Sub-Total		220		207		55		412
	GRAND TOTAL (AID)	99.5	500	163	758	39	210	301.5	1468

1/ Funded Jan. 79 through Dec. 1979 under PIO/T No. 2-80010 from FY 78 funding

2/ To provide funding until Nov. 30, 1979

3/ To provide funding until Dec. 31, 1980

4/ To provide funding until June 30, 1981. (Note: Project funding for local contracts and some PASA terminate prior to 30 June 81)

EXPENDITURE SCHEDULE

IICA CONTRIBUTION

	FY 79		FY 80		FY 81		TOTAL	
1. Technical Assistance	MM	$000	MM	$000	MM	$000	MM	$000
a. Full-Time								
(1) Project Manager (Damtoft)	6	21	12	42	9	31.5	27	94.5
(2) Centers/Systems/Info-Specialist (Avear)	6	21	12	42	9	31.5	27	94.5
(3) Ag. Statistics Spec. (Quiroga)	6	21	12	42	9	31.5	27	94.5
(4) Agricultural Information & Technology Transfer Spec. (C.Arias)	6	21	12	42	9	31.5	27	94.5
Sub-Total	24	84	48	168	36	126	108	378
b. Half-Time								
(1) Research Info Spec. (Bazán-Segura-Miranda)	3	10.5	6	21	4.5	15.8	13.5	47.3
(2) Agric. Planning Spec. (Hond.)	3	10.5	6	21	4.5	15.8	13.5	47.3
(3) Documentary Info Spec. (CIDIA)	1.5	5.2	4	14	4.5	15.8	10.0	35.0
Sub-Total	7.5	26.2	16	56	13.5	47.4	37.0	129.6
c. Short Term								
(Ag Eco/Mkt & other)	8	28	16	56	12	42	36	126
Total Technical Assistance	39.5	138.2	80	280	61.5	215.4	181.0	634.6
2. Operating Expenses								
a. National/Regional Agencies/Committees Coordination	6	8.2	12	16.4	9	12.2	27	36.8
b. Facilities Maintenance, supplies & services		13.6		27.3		20.4		61.3
Total Operating Expenses		21.8		43.7		32.6	27	98.1
3. Facilities and Equipment		54		109		82		245
GRAND TOTAL (IICA)	39.5	214	80	433	61.5	330	181	977

NATIONAL AND REGIONAL AGENCIES CONTRIBUTION

National Program Coordinators	$150,000
Regional Agency Program Coordinators	50,000
National & Regional Agencies TOTAL	$200,000 6/

6/ Includes only the national and regional agencies contribution for planning and coordinating the program, but does not include the agencies related activities that this project is assisting.

BUDGET COMMENTARY

ROCAP Contribution

1. Principal Advisor/ROCAP Project Manager. This position is presently filled and will be continued through the life of the project. Costs are calculated on current USDA PASA rates and support costs. Prior funding will permit continuation of this position through the first half of FY 1979, thus only six months are budgeted for that year in this expenditure schedule. This key position is budgeted through the life of the project until June 30, 1981.

2. Agricultural Rural Sector Statistics (Area Frame Sampling Specialist). This position is presently filled and is budgeted to continue until May 30, 1981. It is anticipated that the present technician will continue throughout the life of the project. The position is presently funded until Feb. 15, 1979 with cost calculated at current USDA rates and support cost.

3. Bio/Agronomist - Data Bases Content Specialist. The present technician in this position will terminate his work on Jan. 19, 1979. The replacement will be sought through the same USDA PASA channel at the same budgeted costs. This technician carries principal responsibility for assistance in information, priority data selection, readily useful data bases development and in first approximation recommendations packaging. Prior funding covers this position through the first quarter of FY 1980. This position is budgeted until May 30, 1981.

4. Agricultural Information Specialist. This is an ongoing position. The technician assists C.A. national Ag information institutions in small farmer information management procedures for data priority selection, area specific profiling/control, multi-developing first approximation preparation of production recommendation to be tested, verified or modified by research organization and transfer methodologies. This technician assists the national information systems in data use to identify major small farm problems and in determining present levels of technology use. This position is presently funded until March 31, 1979 and is budgeted to continue until May 30, 1981. Costs are calculated at present USAID/PASA rates and support cost.

5. Short Term Technical Assistance. These services will be provided from PASA or other sources as appropriate and available. The services will correspond to identified needs in agricultural statistics (approximately 2/3), data bases development, computer programming, data processing, information packaging, transfer, and other relevant areas.

IICA Procured Positions

1. Agricultural Statistics/Area Frame Sampling Specialist. The specialist will assist appropriate national institutions in applying Area Frame Sampling methods in the collection of socio-economic and current technology use data. The specialist will provide assistance and training to improve data collection methods, reliability, relevance, and timeliness of data to establish improvement socio-economic/rural sector data bases as part of the national agricultural information system. Serving all six countries, this technician will be based in San Salvador, and will work in direct cooperation with USDA/PASA Statistics advisor and IICA's Statistics Specialist. The technician will collaborate with other Government technicians in the project, and will serve as the project technical coordinator in El Salvador.

2. Agricultural Climatic Data Specialist. The technician will assist CA national institutions in adopting and applying methodologies and procedures for assembling, processing and analyzing climatic information into more useful climatic data bases supportive to agricultural research and rural sector planning activities. The technician will be based in Tegucigalpa, Honduras. The technician will work in cooperation with project short term climatic data specialist and with IICA's statistician who is responsible for this technical area. He specifically will collaborate with USDA/PASA Bio-Agronomist data base specialist as well as other project technicians. He will serve as the Project technical cooperator in Honduras.

3. Soil/Water Data Specialist. This technician will be based in Managua, Nicaragua. The technician will work with appropriate national organizations, in concert with IICA's Statistician, Soils Research Specialist and the USDA/PASA Bio-Agronomist, in developing and teaching methodologies for handling sources of soils and water agricultural data, its acquisition and integration into data bases within the National Agricultural Information Systems. He will serve as the project's technical coordinator in Nicaragua.

4. Ag Research Data Specialist. This national technician will be based in San José, Costa Rica. The technician will assist in helping national research organization to manage agricultural research results in a manner to have area specific recall/memory for use in future research planning and for developing specific use packages of technology. This technician will work in association with IICA's documentary information specialist, the USDA/PASA Data Bases and Agricultural Information Specialist, and will serve as the technical coordinator in Costa Rica.

5. Ag Economics/Farm Management Specialist. This technician is scheduled to be based in Panama. This technician will assist IICA's statistician and the PASA Bio-Agronomist in the development of production and marketing information data bases including data related to crop and livestock input requirements/outputs, cost and returns for small farm production. The technician will assist in getting the data into data bases for the National Ag Information Systems. The technician will assist with training of staff in appropriate institutions. This technician will serve as technical coordinator in Panama.

6. Rural Sociologist. This technician will be based in Guatemala. The technician will work to assist appropriate national agencies to develop data bases of information on small farmers' level of life indicators, customs, and present technologies use for the purpose of identifying major problem, constraints, and possible opportunities for solving problem.

This national technician will work in cooperation with the IICA specialist in statistics, the USDA/PASA statistician; Information Specialist and the PASA Bio-Agronomist in the development of the data bases in the area of work. This technician will serve as the technical coordinator in Guatemala.

7. Rural Anthropologist. This technician will be based in either Guatemala or Costa Rica and will work in close coordination in the same manner as the Rural Sociologist.

8. Information Systems and Data Bank Specialist. This technician will be based in San José, Costa Rica. The technician will work in close cooperation with IICA's data processing computer specialist and with the IICA Project Manager, in the development of data base centers and networks for the National Agricultural Information Systems.

All of the national contract technicians are budgeted for 23 P/M each beginning April 1, 1979.

NOTE: Location for these technicians could change depending on availability and recruitment at the country level.

9. Travel and Per Diem. Costs are projected on the basis of one trip per month within the region for each member of the core project staff. While some will need to travel more frequently and others less, experience has shown this to be an appropriate average for cost calculations. The cost of one trip is estimated at $380 including air fare, per diem, and ground transportation.

10. Training, Meetings, Technical Exchange. This item covers the following activities:

a. National Training. 36 national-level training courses (6 per participating country) in the various technical disciplines addressed by the project are programmed over the 27 month period. This training will include courses presented by project staff in Ag statistics, data base development and use packaging, small farm technology/quality of life indication data development, and information centers development and management. Each course is budgeted at $1,000.

b. Regional Training. 11 regional-level training workshops, sessions are programmed in the technical areas noted above. A total of 110 participants are estimated at a cost of $375 each.

c. Production Technology Exchange. 60 technicians at an estimated cost of $375 each are programmed for special regional training and technician exchange among national and regional agencies.

d. Committee meetings. Four meetings of the regional advisory and coordinating committees are scheduled with a projected participation of a total of 120 committee members at a cost of $275 each.

e. Orientation courses. These sessions are designed to keep agency heads and supervisory personnel abreast of the project training and activities of those technicians for whose work they are responsible. One course in each country in seven technical disciplines is programmed at an average cost of slightly over $500 per course.

11. Surveys and Studies. Short-term contracts will utilize ongoing country surveys and studies to obtain specialized information on small farmers. In those countries where the area frame sample is operational, that survey method will be employed. Contracted services will include limited assistance in analysis of data collected to suggest problems and their solutions to national planning agencies. These data and analyses also will be passed to those regional agencies which may usefully employ them (especially ICAITI and CATIE). Approximately two to three exercises in each participating country.

12. Short Term Contracts. This item covers projected costs of necessary additional support services in such areas as computer time, editing and preparing publications and training materials, short-term secretarial services, etc.

13. Evaluations. Three in-house evaluations are budgeted, one in June 1979, June, 1980, and another in May-June, 1981. Estimated expenditures cover travel, salaries and per diem of evaluators.

14. Commodities. Included here are the procurement costs of one utility vehicle for general project support and one duplicating machine (photocopy). This equipment will become the property of IICA and will be used in continuing support of the program after the completion of the project.

15. Supplies and Materials. Budgeted here are the estimated costs of the routine office supplies and related materials needed in support of the activities of the project staff.

IICA Contribution

1. Technical Assistance. (This portion of the budget reflects IICA's calculation of an average monthly salary of $3,500 for professional staff personnel.)

a. Full Time

(1) Project Manager. This is a continuing position.

(2) Agricultural Information Center System Specialist. This is a continuing position providing professional assistance to participating country agencies in developing improved standardized procedure for managing both numerical and document information data.

(3) Agricultural Statistics Specialist. This is a continuing position. The incumbent works with the national information agencies to help further development and use of the area frame, develop data processing centers with better data storage,retrieval and analysis capacities and coordinate with the USDA/PASA technical assistance.

(4) Agricultural Information and Technology Transfer Specialist. This is a continuing position. The technician provides assistance in data base development and use to prepare area profiles leading to development of first approximation recommendations.

b. Half time. These are ongoing positions whose incumbents will devote half their time to the project:

(1) Research Information Specialists. These technicians will provide assistance to appropriate agencies in C.A. country as time permits.

(2) Agricultural Planning Specialist. Based in Honduras, this technician will assist that country and others in packaging of use of agricultural information.

(3) Documentary Information Specialist. This technician is based at IICA headquarters in San Jose. The incumbent works with national agencies in standardizing methods of handling and controlling documents.

c. Short term. This item reflects the part-time assistance of other IICA professional staff. Included in this category are the principal IICA representatives in each of the six participating countries as well as specialists in agricultural research, planning, market information and other areas of project interest.

2. Operating Expenses

a. National/Regional Agencies/Committees Coordination. This is an ongoing activity previously funded by AID for the project. IICA will assume the responsibility during the budgeted period. They will provide continuous leadership and liaison with the six regional advisory committees and the six national coordinating committes.

b. Facilities Maintenance, Supplies and Services. Budgeted here are IICA's costs for upkeep of the facilities used by the project staff (see following item), and the associated supplies and services as well as administrative expenses entailed in operation of those facilities.

3. Facilities and Equipment. This item reflects the costs of those IICA facilities and the related operational equipment which are used by the project staff. This includes use of the headquarters facility at San José, Costa Rica, as well as the North Zone (Central America Regional) headquarters in Guatemala and the IICA offices in each of the countries where the project is active.

National and Regional Agencies Contribution

1. National Program Coordinators. This item includes one full time professional in each of the six participating countries to oversee and coordinate project activities. The coordinator will be assigned by one of the participating agencies and will help coordinate project activities both among the various information centers in his country as well as between them and appropriate regional agencies.

2. Regional Agency Program Coordinators. This item refers to one individual in each of the participating regional agencies

who will act as contact and coordinator of project activities as related to the individual's agency and between his agency and project activities. Costs of this project contribution are calculated on part time (approx. 15 to 25%) project support. Regional agencies participating to improve information services and to develop information centers are: CABEI, ICAITI, CATIE, INCAP, OIRSA, and SIECA. The regional agency specialist will assist in planning for PIADIC agency activities to strengthen and standardize information handling methodologies and to improve transfer linkages with national information centers, other regional and international agricultural information sources.

SMALL FARM PRODUCTION SYSTEMS PROJECT

DETAILED PROJECTED BUDGET - ROCAP/CONTRIBUTION

FOR THE PERIOD APRIL 1979 - THROUGH SEPTEMBER 30, 1983

Personnel Grade	No.	Category	Person/ Months	(US $000) Total	Fiscal Years 1979	1980	1081	1982	1983
		A. Project Direct Cost - Scientific							
		1. Professional Staff							
		a. Crop Specialists - Long Term							
PhD	1	Horticulturalist (Holle)	48	127	11	29	30	30	27
PhD	1	Crop Management (Burgos)	48	130	11	30	30	31	28
PhD	1	Pest Management (Saunders)	48	132	11	31	31	31	28
PhD	2	Resident Agronomist	96	270	23	63	64	64	56
PhD & MS	4	Resident Agronomist (Koss, De Lucia, Arze, Palencia)	192	438	37	101	104	104	92
AE	3	Analog Resident	144	168	14	39	40	41	34
		Total	576	1,265	107	293	299	301	265
		b. Animal Specialists - Long Term							
PhD	1	Small Animals	52.5	145	12	33	34	35	31
MS	1	Animal Health	48	116	10	27	28	28	23
MS	3	Resident Animal Specialists Sr.	144	348	30	81	82	82	73
AE	3	Resident Animal Specialist Jr.	144	168	14	39	40	40	35
		Total	388.5	777	66	180	184	185	162
		c. Other Specialists - Long Term							
PhD	1	Data Management Officer	48	135	11	31	31	32	30
PhD	1/2	Anthropolo ist	24	68	6	16	16	16	14
PhD	1	Agricultural Micro-Economist (Navarro)	48	112	10	26	27	27	22
MS	1	Scientific Documentation Officer (Jiménez)	48	109	9	26	26	26	22
AE	2	Micro Economic Assistants	96	112	9	26	26	26	25
MS	1	Production & Marketing Economist	48	116	10	27	27	27	25
MS	1	Climatic Characteristics Spec.	18	36	3	8	9	9	7
MS	1	Soil Characteristics Spec.	18	36	3	8	9	9	7
		Total	348	724	61	168	171	172	152
		d. Agric. Info. & Utilization							
PhD	1	Rural Dev. Agr. Information	48	135	11	31	32	32	29
MS	1	Info. Materials Specialist	48	116	10	27	27	28	24
PhD	1/2	Anthropologist	24	67	6	15	16	16	14
AE	3	Transfer Research Resident	192	168	14	39	40	40	35
		Total	312	486	41	112	115	116	102
		e. Consultants - Short Term							
PhD	1	Agroclimatologist	4	20	2	5	5	5	3
PhD	1	Utilization Research Advisor	9	45	4	10	11	11	9
PhD	1	Small Ruminants	10	50	4	11	12	12	11
PhD	1	Apiculture	2	10	1	2	2	2	3
PhD	1	Utilization Evaluation	4	20	2	5	5	5	3
PhD	1	Biometrics/Modeling Specialist	5	25	2	6	6	6	5
PhD	1	Documentation	2	10	1	2	2	2	3
PhD	1	Mass Media Specialist	5	25	2	6	6	6	5
PhD	1	Other Technical Advisor	4	20	1	5	4	4	6
PhD	1	Soil Characteristics Specialist	8	40	3	9	10	10	8
		Total	53	265	22	61	63	63	56
		Total Professional Staff	1,677.5	3,517	297	814	832	837	737

SMALL FARM PRODUCTION SYSTEMS PROJECT
-DETAILED PROJECTED BUDGET - ROCAP/CONTRIBUTION
FOR THE PERIOD APRIL 1979 - THROUGH SEPTEMBER 30, 1983

Personnel Grade	No.	Category	Person/ Months	(US $000) Total	Fiscal Years 1979	1980	1981	1982	1983
		2. Non-Professional Staff							
		a. Crop - Long Term							
9		Auxiliary Assistants	432	173	15	40	41	41	36
3		Secretaries	145	93	7	21	22	22	21
		Total	577	266	22	61	63	63	57
		b. Animals - Long Term							
2		Auxiliary Assistants	96	40	3	9	10	10	8
1		Secretary	48	32	3	8	7	7	7
		Total	144	72	6	17	17	17	15
		c. Other - Short & Long Term							
8		Field Laborers/Research Supp.	384	107	9	25	25	25	23
		Typist Data Clerks	18	64	5	15	16	16	12
		Contract Support Personnel	34	123	11	28	29	29	26
		Total	436	294	25	68	70	70	61
		Total Non-Professional Staff	1,157	632	53	146	150	150	133
		Total Personnel Costs	2,834.5	4,149	350	960	982	987	870
		3. Commodities							
		a. Crops							
8		Vehicles		64	40	16	8	—	—
		Laboratory & Scientific Equip.		52	37	5	5	5	—
		Office Furniture & Equipment		15	15	—	—	—	—
		Total		131	92	21	13	5	—
		b. Animals							
9		Vehicles		72	56	16	—	—	—
		Laboratory and Scientific Equipment		25	25	—	—	—	—
		Animal Demonstration Facilities		40	30	10	—	—	—
		Office Furniture and Equipment		20	20	—	—	—	—
		Total		157	131	26	—	—	—
		c. Other Specialists							
6		Vehicles		40	40	—	—	—	—
		Office Furniture and Equipment		8	8	—	—	—	—
		Total		48	48	—	—	—	—
		d. Agricultural Info. and Utilization							
		Office Furniture and Equipment		21	21	—	—	—	—
		Total Commodities		357	292	47	13	5	—

SMALL FARM PRODUCTION SYSTEMS PROJECT
DETAILED PROJECTED BUDGET - ROCAP/CONTRIBUTION
FOR THE PERIOD APRIL 1979 - THROUGH SEPTEMBER 30, 1983

Personnel Grade	No.	Category	Person/ Months	(US $000) Total	Fiscal Years 1979	1980	1981	1982	1983
4. Travel and Per Diem									
a. Crops									
		In-Country		50	4	12	12	12	10
		Regional (C.A. countries)		301	25	69	71	72	64
		International		22	3	5	5	5	4
		Total		373	32	86	88	89	78
b. Animal									
		In-Country		30	3	7	7	7	6
		Regional (C.A. countries)		184	15	42	44	44	39
		International		12	1	3	2	3	3
		Total		226	19	52	53	54	48
c. Other Specialists									
		In-Country		30	3	7	7	7	6
		Regional (C.A. countries)		106	9	25	25	25	22
		International		10	—	2	3	3	2
		Total		146	12	34	35	35	30
		Total Travel and Per Diem		745	63	172	176	178	156
5. Training									
		Conferences and Workshops		120	10	28	28	28	26
		Post-Graduate Scholarships		160	14	37	38	38	33
		Publications and Reprints		48	4	11	12	12	9
		Total Training		328	28	76	78	78	68
6. Operation and Maintenance of Equipment									
		Transportation Equipment		271	23	63	64	64	57
		Other Equipment		16	1	3	4	4	4
		Total Operation & Maint. of Equipment		287	24	66	68	68	61
7. Research Materials/Supplies & Data Processing									
		Laboratory and Scientific		10	1	3	2	2	2
		Research Animals		30	3	7	7	7	6
		Plant Materials		12	1	3	4	4	—
		Analyses and Tests		54	5	12	13	13	11
		Data Processing		75	6	17	18	18	16
		Secondary Data Processing		23	2	5	5	5	6
		Other		52	4	12	13	13	10
		Total Materials, Supplies and Data Processing		256	22	59	61	61	53
8. Other Costs									
		Communications		32	3	7	8	8	6
		Office Supplies and Materials		48	4	11	11	11	11
		Reporting Costs		16	1	4	4	4	3
		Total Other		96	8	22	23	23	20
		Total Project Direct Cost - Scientific		6,219	787	1,402	1,401	1,400	1,229

SMALL FARM PRODUCTION SYSTEMS PROJECT
DETAILED PROJECTED BUDGET - ROCAP/CONTRIBUTION
FOR THE PERIOD APRIL 1979 - THROUGH SEPTEMBER 30, 1983

(US $000)

Personnel Grade No.	Category	Person/ Months	Total	Fiscal Years 1979	1980	1981	1982	1983
9.	Management Support - CATIE							
	a. Personnel - Non-Professional		266	23	62	63	63	55
	b. Travel and Per Diem		22	2	5	5	5	5
	c. Commodities		51	43	3	3	2	---
	d. Maint. & Per. Equip - Infras.		72	6	17	17	17	15
	e. Other Costs		24	2	6	6	6	4
	Total Management Support - CATIE		435	76	93	94	93	79
	Total Project Cost Reimbursable to CATIE		6,653	863	1,495	1,495	1,493	1,307
10.	Management Office - ROCAP							
	a. Personnel (Apr. 1, 1979) Local Contract		116	10	27	27	28	24
	PASA		270	30	60	60	60	60
	b. Travel and Per Diem		56	12	11	11	11	11
	c. Evaluations		58	5	13	14	14	12
	Total Costs Paid Directly by ROCAP		500	57	111	112	113	107
	Total Project Costs		7,153	920	1,606	1,607	1,606	1,414
B.	Contingency		250	20	59	58	59	54
	PROJECT TOTAL	2,834.5	7,403	940	1,665	1,665	1,665	1,468

SMALL FARM PRODUCTION SYSTEMS PROJECT

DETAILED COST BREAKDOWN BY COUNTRY - ROCAP/CONTRIBUTION

(US $000)

	COST INCURRED BY CATIE								
		OUTSIDE OF CATIE							
	At CATIE	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama	ROCAP	Total
A. Project Direct Cost -Scientific									
1. Professional Staff									
a. Crop Specialists - Long Term									
Horticulturalist	85	7	7	7	7	7	7	-	127
Crop Management	88	7	7	7	7	7	7	-	130
Pest Management	90	7	7	7	7	7	7	-	132
Resident Agronomist	-	118	118	118	118	118	118	-	708
Analog Resident	-	-	56	56	56	-	-	-	168
Total	263	139	195	195	195	139	139	-	1265
b. Animal Specialists - Long Term									
Small Animals	103	7	7	7	7	7	7	-	145
Animal Health	80	6	6	6	6	6	6	-	116
Resident Animal Specialist									
Specialist Sr.	-	116	-	116	-	-	116	-	348
Specialist Jr.	-	-	56	-	56	56	-	-	168
Total	183	129	69	129	69	69	129	-	777
c. Other Specialists - Long Term									
Data Management Officer	135	-	-	-	-	-	-	-	135
Anthropologist 1/2 Time	47	3	3	3	4	4	4	-	68
Agricultural Micro-Economist	102	-	-	3	3	4	-	-	112
Scientific Documentation Off.	109	-	-	-	-	-	-	-	109
Micro Economic Assistants	-	-	56	56	-	-	-	-	112
Production and Marketing Econ.	80	6	6	6	6	6	6	-	116
Climatic Characteristics Spec.	36	-	-	-	-	-	-	-	36
Soil Characteristics Spec.	36	-	-	-	-	-	-	-	36
	545	9	65	68	13	14	10	-	724
d. Agric. Info. & Utilization									
Rural Div. Agr. Info.	123	-	-	4	4	4	-	-	135
Info. Materials Specialist	104	-	-	4	4	4	-	-	116
Anthropologist 1/2 Time	46	-	-	7	7	7	-	-	67
Transfer Research Resident	-	-	-	56	56	56	-	-	168
Total	273	-	-	71	71	71	-	-	486
e. Consultants - Short Term									
Agroclimatologist	5	-	5	5	5	-	-	-	20
Utilization Research Advisor	-	-	-	15	15	15	-	-	45
Small Ruminants	8	7	7	7	7	7	7	-	50
Apiculture	2	2	1	1	1	1	2	-	10
Utilization Evaluation	-	-	-	7	7	6	-	-	20
Biometrics/Modeling Spec.	25	-	-	-	-	-	-	-	25
Documentation	3	-	-	3	2	2	-	-	10
Mass Media Specialist	7	-	-	6	6	6	-	-	25
Other Technical Advisor	3	3	3	3	3	3	2	-	20
Soil Characteristics Spec.	40	-	-	-	-	-	-	-	40
	93	12	16	47	46	40	11	-	265
TOTAL PROFESSIONAL STAFF	1357	289	345	510	394	333	289	-	3517

(US $000)

	COST INCURRED BY CATIE								
		OUTSIDE OF CATIE							
	At CATIE	Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama	ROCAP	Total
2. Non-Professional Staff									
a. Crop - Long Term									
Auxiliary Assistants	59	19	19	19	19	19	19	-	173
Secretaries	93	-	-	-	-	-	-	-	93
Total	152	19	19	19	19	19	19	-	266
b. Animals - Long Term									
Auxiliary Assistants	40	-	-	-	-	-	-	-	40
Secretaries	32	-	-	-	-	-	-	-	32
Total	72	-	-	-	-	-	-	-	72
c. Other - Short & Long Term									
Field Laborers/Research supp.	107	-	-	-	-	-	-	-	107
Typist Data Clerks	64	-	-	-	-	-	-	-	64
Contract Support Personnel	34	15	15	15	15	15	14	-	123
Total	205	15	15	15	15	15	14	-	294
TOTAL NON-PROFESSIONAL STAFF	429	34	34	34	34	34	33	-	632
TOTAL PERSONNEL COSTS	1786	323	379	544	428	367	322	-	4149
3. Commodities									
a. Crops									
Vehicles	16	8	8	8	8	8	8	-	64
Laboratory & Scientif.Equip.	52	-	-	-	-	-	-	-	52
Office Furniture & Equip.	11	-	-	-	-	-	4	-	15
Total	79	8	8	8	8	8	12	-	131
b. Animals									
Vehicles	24	8	8	8	8	8	8	-	72
Laboratory	25	-	-	-	-	-	-	-	25
Animal Domest. Facilities	40	-	-	-	-	-	-	-	40
Office Furniture & Equip.	-	4	4	3	3	3	3	-	20
Total	89	12	12	11	11	11	11	-	157
c. Other Specialists									
Vehicles	16	-	-	8	8	8	-	-	40
Office Furniture & Equip.	2	-	-	2	2	2	-	-	8
Total	18	-	-	10	10	10	-	-	48
d. Agricultural Info & Utiliz.									
Office Furniture & Equip.	6	-	-	5	5	5	-	-	21
TOTAL COMMODITIES	192	20	20	34	34	34	23	-	357
4. Travel and Per Diem									
a. Crops									
In Country	5	5	10	10	10	5	5	-	50
Regional (CA countries)	-	49	52	52	52	48	48	-	301
International	7	2	3	3	3	2	2	-	22
Total	12	56	65	65	65	55	55	-	373
b. Animal									
In-Country	6	4	4	4	4	4	4	-	30
Regional (CA countries)	-	31	31	31	31	30	30	-	184
International	5	3	-	2	-	-	2	-	12
Total	11	38	35	37	35	34	36	-	226

(US $ 000)

COST INCURRED BY CATIE

	At CATIE	OUTSIDE OF CATIE							
		Guatemala	El Salvador	Honduras	Nicaragua	Costa Rica	Panama	ROCAP	Total
c. Other Specialists									
In-Country	16	-	-	5	5	4	-	-	30
Regional (CA countries)	-	5	4	31	31	31	4	-	106
International	10	-	-	-	-	-	-	-	10
Total	26	5	4	36	36	35	4	-	146
TOTAL TRAVEL & PER DIEM	49	99	104	138	136	124	95	-	745
5. Training									
Conferences and Workshops	30	15	15	15	15	15	15	-	120
Post-Graduate Scholarships	-	16	32	32	32	16	32	-	160
Publications and Reprints	24	4	4	4	4	4	4	-	48
Total Training	54	35	51	51	51	35	51	-	328
6. Operation & Maint. of Equip.									
Transportation of Equipment	84	24	24	38	38	39	24	-	271
Other Equipment	12	-	-	1	1	1	1	-	16
Total Operation & Maint. of Equipment	96	24	24	39	39	40	25	-	287
7. Research Materials/Analysis and Data Processing									
Laboratory & Scientific	4	1	1	1	1	1	1	-	10
Research Animals	30	-	-	-	-	-	-	-	30
Plant Materials	2	2	2	2	2	1	1	-	12
Analysis and Tests	33	4	4	4	3	3	3	-	54
Data Processing	75	-	-	-	-	-	-	-	75
Key Punch Data	-	4	4	4	4	4	3	-	23
Other Materials/Supp.	8	8	8	7	7	7	7	-	52
Total Res.Mat/Analysis and Data Processing	152	19	19	18	17	16	15	-	256
8. Other Costs									
Communications -Off. Sup & Mat.	20	2	2	2	2	2	2	-	32
Sr. Technician	12	1	1	1	1	1	1	-	18
Jr. Technician	1	1	1	1	1	1	1	-	7
Info Transfer	6	-	-	6	6	5	-	-	23
Reporting Costs	16	-	-	-	-	-	-	-	16
Total	55	4	4	10	10	9	4	-	96
9. Management Support - CATIE									
a. Personnel - Non-Professional	126	19	21	32	21	19	18	-	266
b. Travel & Per Diem	11	2	2	3	2	1	1	-	22
c. Commodities	26	3	4	6	4	4	4	-	51
d. Maint & Oper. Equip. - Inf.	37	5	5	9	6	5	5	-	72
e. Other Costs	12	2	2	3	2	1	2	-	24
Total Management Supp. CATIE	212	31	34	53	35	30	30	-	435
TOTAL PROJECT COST REIMBURSABLE TO CATIE	2606	555	635	887	750	635	565	-	4833
10. ROCAP EXPENSES (PERSONNEL, TRAVEL, EVALUATIONS)	-	-	-	-	-	-	-	500	500
11. Contingency	98	20	25	32	28	25	22	-	250
PROJECT TOTAL	2704	575	660	919	778	660	587	500	5,083

Small Farm Production Systems Project
Detailed Projected Budget CATIE/Contribution
For the Period Apr. 1979 to Sep. 30, 1983

(U.S. $000)

Personnel Grade	No.	Category	Person Months	Total Budget	Fiscal Years 1979	1980	1981	1982	1983
		4. Maintenance & Operation of Equipment							
		Vehicle Maintenance & Oper.		52	6	13	13	13	7
		Other Equipment		12	1	3	3	3	2
		Total Maintenance and Oper. of Equip.		64	7	16	16	16	9
		5. Research Mtls. and Related Costs							
		Animal Feeds, Minerals, etc.		32	4	8	8	8	4
		6. Other Direct Project Costs							
		Field Research Land Equipment		150	19	38	38	38	17
		Communications		8	1	2	2	2	1
		Other Supplies and Services		80	10	20	20	20	10
		Total Other Direct Project Costs		238	30	60	60	60	28
		7. Travel and Per Diem		26	3	7	7	6	3
		Total Project Cost-Scientific		1,797	227	453	449	445	223
		B. Project Cost Management							
		1. Professional Staff							
PHD	1/3	Director of CATIE (Fonseca)	16	51	6	13	13	13	6
PHD	3/4	SubDirector Research (Muñoz)	36	97	11	26	26	26	8
PHD	1/3	SubDirector Train.&Tech Coop. (Locatelli)	20	57	9	14	14	14	6
ADM	1/2	SubDirector Admin. (Delfino)	24	52	7	13	13	13	6
PHD	1/3	Prog. Head Crops (Ofaro)	13	47	3	13	13	13	3
PHD	1/3	Prog. Head Animals (Cubillas)	18	47	5	13	13	13	3
MS	1/4	Training Officer (Leon)	12	27	4	7	7	7	2
PHD	1	Project Assistance Research Officer 1/	48	135	24	29	32	30	20
		Total	192	513	71	128	131	129	54
		2. Non-Professional Staff							
	2	Secretaries	36	52	7	16	16	16	7
	12	Other Admin. Staff	576	230	28	58	58	58	28
		Total	672	292	35	74	74	74	35
		Total Personnel Costs	364	305	106	202	205	203	89
		3. Travel and Per Diem		18	1	5	5	5	2
		4. Commodities							
		Data Management Equip.		18	2	5	5	5	1
		Vehicles		22	2	6	6	6	2
		Office Furniture & Equip.		20	3	5	5	5	2
		Total		60	7	16	16	16	5
		5. Maintenance and Operation of Equipment							
		Vehicle		60	8	15	15	15	7
		Other		60	8	15	15	15	7
		Total		120	16	30	30	30	14

1/ Based on P40 level of Exhibit II for New Hire.

Small Farm Production Systems Project
Detailed Projected Budget CATIE/Contribution
For the Period Apr. 1979 - to Sep. 30, 1983

Personnel Grade	No.	Category	Person Months	Total Budget	(U.S. $000) Fiscal Years 1979	1980	1981	1982	1983
		A. Project Cost - Scientific							
		1. Professional Staff							
		a. Crop Specialists Long Term							
PHD	1	Agron/Prog Head (OAoro)	26	70	11	16	16	16	11
PHD	1	Plant Pathologist (Moreno)	48	122	16	30	30	30	16
PHD	1	Agron/Systems (Hart)	48	116	15	29	29	29	14
PHD	1	Soil Specialist (Bazan)	36	33	13	23	23	23	11
PHD	1	Physiologist (Fargas)	24	57	7	14	14	14	8
MS	1	Soil Laboratory Head (Diaz)	24	47	6	12	12	12	5
MS	1	Agron/Systems (Meneses)	42	49	6	13	13	11	6
		Total	248	554	74	137	137	135	71
		b. Animal Specialists Long Term							
PHD	1	Past & Forage/Prog Head (Cubillas)	26	70	11	16	16	16	11
PHD	1	Animal Systems (Vohnout)	48	125	16	31	31	31	16
PHD	1	Animal Nutrition (Ruiz)	48	116	15	29	29	29	14
PHD	1	Animal Production (Deaton)	24	63	8	16	16	16	7
AE	1	Farm Manag. Assist. (Fuentes)	24	24	3	6	6	6	3
		Total	170	398	53	98	98	98	51
		Total Professional Staff	418	952	127	235	235	233	122
		2. Non-Professional Staff							
		a. Crops							
	5	Auxiliary Assistants	240	96	12	24	24	24	12
	2	Secretaries	96	62	7	16	15	16	7
	10	Field Laborers	480	76	9	19	19	19	10
		Total	816	234	28	59	59	59	29
		b. Animals							
	2	Auxiliary Assistants	96	38	4	10	10	10	4
	1	Secretaries	48	31	3	8	8	8	4
	6	Field Laborers	288	46	5	12	12	12	5
		Total	432	115	12	30	30	30	13
		Total Non-Professional Staff	1,248	349	40	89	89	89	42
		Total Personnel Costs	1,666	1,301	167	324	324	322	164
		3. Commodities							
		a. Crops							
		Office Furniture & Equipment - New		55	7	14	14	14	6
		Laboratory Equipment		10	1	3	3	2	1
		Vehicle Replacement		24	3	6	6	6	3
		Total		89	11	23	23	22	10
		b. Animals							
		Office Furniture & Equip.		30	4	8	8	8	3
		Laboratory Equipment		5	1	4	-	-	-
		Vehicle Replacement		12	1	3	3	3	2
		Total		47	5	15	11	11	5
		Total Commodities		136	16	38	34	33	15

Small Farm Production Stystems Project
Detailed Projected Budget CATIE/Contribution
For the Period Apr. 1979 - to Sep. 30, 1983

Personnel Grade	No.	Category	Person Months	(U.S. $000) Total Budget	Fiscal Years 1979	1980	1981	1982	1983
		6. Other							
		Communications		16	2	4	4	4	2
		Other Supplies and Services		120	15	30	30	30	15
		Total		136	17	34	34	34	17
		Total Project Cost Management		1,139	147	287	290	288	127
		Total Project Direct Cost Scientific and Management		2,936	374	740	739	733	350

Small Farm Production Systems Project
Detailed Projected Budget - Other Donors Contribution
For the Period Apr. 1979 - to Sep. 30, 1983

Personnel Grade	No.	Category	Person Months	(U.S. $000) Total Budget	Fiscal Years 1979	1980	1981	1982	1983	Remarks
		A. Project Cost								
		1. Professional Staff								
		a. Crop Specialists								
PHD	1	Entomologist - ODM	48	152	19	38	38	38	19	Committed
PHD	2	Weed Man & Control IICA/AID	96	304	38	76	76	76	38	Committed
PHD	1	Agron/Systems -OAS	24	76	19	38	19	--	--	Committed
PHD	1	Crop Physiologist-ODM	48	152	19	38	38	38	19	Proposed
AE	3	Agron/Systems 2 Nic, 1 Hond.	72	126	31	63	32	--	--	Committed
		Total	288	810	126	253	203	152	76	
		b. Animal Specialists								
PHD	1	Pasture & Forage ODM	48	152	19	38	38	38	19	Proposed
MS	1	Animal Production IDRC	24	66	17	33	16	--	--	Committed
MS	1	Animal Nutrition IDRC	24	66	17	33	16	--	--	Committed
		Total	96	284	53	104	70	38	19	
		c. Other Specialists								
PHD	1	Economist - IDRC	24	76	19	38	19	--	--	Committed
PHD	1	Marketing Specialist DSB/AID	48	152	19	38	38	38	19	Proposed
PHD	1	Agric Economist DSB/AID	48	152	19	38	38	38	19	Proposed
		Total	120	380	57	114	95	76	38	
		d. Consultants - Short Term								
PHD	1	Agro Climatologist ODM	12	60	10	15	15	15	5	Proposed
PHD	1	Biometrist - ODM	12	60	10	15	15	15	5	Proposed
		Total	24	120	20	30	30	30	10	
		2. Non-Professional Staff								
		Auxiliary Assistance	192	78	13	26	13	13	13	
		Total Personnel Cost	720	1,672	269	527	411	309	156	
		3. Commodities								
		10 Vehicles		60	60	--	--	--	--	
		Office Furniture & Equipment		19	6	4	4	4	1	
		Total		79	66	4	4	4	1	
		4. Travel and Per Diem								
		In-Country and Regional		76	11	24	22	14	5	
		Outside Region		16	2	4	4	4	2	
		Total		92	13	28	26	18	7	
		5. Training								
		Scholarships-Netherlands		320	40	80	80	80	40	
		Scholarships - Others		64	8	16	16	16	8	
		Short Courses OAS		120	15	30	30	30	15	
		Total		504	63	126	126	126	63	
		6. All Other Project Costs								
		Other Supplies & Services		46	7	13	11	10	5	
		Total Project Cost		2,393	418	698	578	467	232	

SMALL FARM PRODUCTION SYSTEMS PROJECT
Detailed Projected Budget-National Institutions
For the Period April 1, 1979 to Sep. 30, 1983

(US $000)

	Total Budget	Fiscal Years 1979	1980	1981	1982	1983
Project Cost Elements						
1. Personnel Cost						
Costa Rica	565	113	113	113	113	113
El Salvador	625	125	125	125	125	125
Guatemala	1,475	295	295	295	295	295
Honduras	660	132	132	132	132	132
Nicaragua	510	102	102	102	102	102
Panama	540	108	108	108	108	108
Total	4,375	875	875	875	875	875
2. Commodities						
Costa Rica	185	37	37	37	37	37
El Salvador	85	17	17	17	17	17
Guatemala	1,040	208	208	208	208	208
Honduras	300	60	60	60	60	60
Nicaragua	150	30	30	30	30	30
Panama	440	88	88	88	88	88
Total	2,200	440	440	440	440	440
3. Other						
Costa Rica	60	12	12	12	12	12
El Salvador	85	17	17	17	17	17
Guatemala	520	104	104	104	104	104
Honduras	125	25	25	25	25	25
Nicaragua	95	19	19	19	19	19
Panama	345	69	69	69	69	69
Total	1,230	246	246	246	246	246
4. Project Total						
Costa Rica	810	162	162	162	162	[illegible]
El Salvador	795	159	159	159	159	[illegible]
Guatemala	3,035	607	607	607	607	607
Honduras	1,085	217	217	217	217	217
Nicaragua	755	151	151	151	151	151
Panama	1,325	265	265	264	265	265
Total	7,805	1,561	1,561	1,561	1,561	1,561

C A T I E
GENERAL WORKING FUND
COMPARATIVE STATEMENT OF ASSETS & LIABILITIES
AS OF JUNE 30, 1974, 1975, 1976 AND 1977

(U.S. $000)

ASSETS	1974	1975	1976	1977
Cash	$121	$110	$106	$194
Investments	53	51	29	144
Accounts Receivable	124	98	157	309
Inventories:				
Coffee	43	29	14	100
Supplies & Materials	65	61	48	36
Total Assets	$406	$349	$354	$783
LIABILITIES				
Bank Notes	$ 15	$ 20	$ 4	
Accounts Payable	13	8	12	$ 23
Third Party Funds	49	117	112	297
Revolving Funds	16	7	9	18
Reserves & Provisions	99	33	52	109
Total Liabilities	$192	$185	$189	$447
Net Assets	$214	$164	$165	$336
Net Assets Represented by:				
GOCR Contribution	$ 50	$ 55		
Excess Assets Over Liabilities Transferred by IICA	136	99	$ 99	$ 99
GENERAL WORKING FUND	28	10	66	237
	$214	$164	$165	$336

CATIE

General Working Fund

Comparative Consolidated Income & Expense Statements
For Years Ending June 30, 1974, 1975, 1976 and 1977

(US $000)

	Fiscal Year Ending June 30,			
	1974	1975	1976	1977
Basic Budget Income (Exhibit III)	$1,054	$ 870	$ 985	$1,336
Other Income	135	83	22	5
Total Income	$1,189	$ 953	$1,007	$1,341
Basic Budget Expenses (Exhibit VI)	$ 695	$ 724	$ 910	$ 910
Other Expenses	280	163	30	193
Total Expenses	$ 975	$ 887	$ 940	$1,103
Excess of Income Over Expenses	$ 214	$ 66	$ 67	$ 238

CATIE

Detail of Basic Budget Income and Other Restricted Resources

(US $000)

	Fiscal Year Ending June 30,			
	1974	1975	1976	1977
Member Quotas				
IICA Annual Contribution	$ 695	$ 616	$ 537	$ 500
IICA Extraordinary Contribution	--	--	20	--
Costa Rica	50	50	100	50
Panama	--	--	50	50
	$ 745	$ 666	$ 707	$ 600
Commercial Operations (Net) (Exhibit IV)				
Cattle & Milk Operation	$ 41	$ 26	$ 23	$ 6
Turrialba Farm	79	72	114	425
La Lola Farm	29	19	14	82
	$ 149	$ 117	$ 151	$ 513
Administration of Goods and Services				
Residence, Guest Room Rental	$ 56	$ 63	$ 67	$ 100
Difference in Exchange Rate	91	--	--	--
Cattle Sale	--	--	26	--
Working Fund - Directorate Revenues	--	10	10	67
Other Revenue Producing Services	4	4	4	11
Various Unrestricted Agreements	9	10	20	45
	$ 160	$ 87	$ 127	$ 223
Total Basic Budget Income	$1,054	$ 870	$ 985	$1,336
Other Restricted Resources (Exhibit V)				
Governments Contributions	$ 118	$ 214	$ 280	$ 145
Regional and International Organizations	72	50	250	478
Public Sector	48	65	47	80
Private Sector	109	98	124	178
	$ 347	$ 427	$ 701	$ 881
Total Sources	$1,401	$1,297	$1,686	$2,217

CATIE

Income and Expenses by Commercial Operation
Fiscal Year Ending June 30, 1974, 1975, 1976 and 1977

(US $000)

	Income	Expenses	Net Income
Cattle & Milk Operations	$ 158	$ 117	$ 41
Turrialba Farm	206	127	79
La Lola Farm	61	32	29
Total 1974	$ 425	$ 276	$ 149
Cattle & Milk Operations	$ 157	$ 131	$ 26
Turrialba Farm	207	135	72
La Lola Farm	48	29	19
Total 1975	$ 412	$ 295	$ 117
Cattle & Milk Operations	$ 118	$ 95	$ 23
Turrialba Farm	275	161	114
La Lola Farm	56	42	14
Total 1976	$ 449	$ 298	$ 151
Cattle & Milk Operations	$ 106	$ 100	$ 6
Turrialba Farm	623	198	425
La Lola Farm	124	42	82
Total 1977	$ 853	$ 340	$ 513

CATIE

Other Restricted Resources
Fiscal Year Ending June 30, 1974, 1975, 1976 and 1977
(US $000)

	Fiscal Year Ending June 30,			
	1974	1975	1976	1977
Government Contributions				
Gov. of Holland	$ 98	$ 31	--	--
Gov. of Great Britain	20	20	$ 75	--
Scholarships Gov. of Holland, Germany and Others	--	163	205	$ 145
Totals	$ 118	$ 214	$ 280	$ 145
Regional & International Organizations				
ROCAP	$ 2	--	$ 177	$ 457
OEA - Org. of American States	35	$ 20	23	--
FAO	33	--	--	--
IICA - MIDA Panama	--	10	40	21
Hypsipila Project & Other	2	20	10	--
Totals	$ 72	$ 50	$ 250	$ 478
Public Sector				
Univ. of Costa Rica	$ 22	$ 39	$ 47	$ 50
State Univ. of N. Carolina	26	26	--	--
Central Bank of Honduras	--	--	--	30
Totals	$ 48	$ 65	$ 47	$ 80
Private Sector				
Nuclear Energy Program(NEP)	$ 75	$ 65	$ 76	--
National Science Foundation	22	22	25	--
American Crop Res. Inst(ACRI)	--	--	5	25
Tennessee Valley Authority	5	7	5	--
Costa Rican Coffee Office	4	4	7	$ 7
ALCOA & IDRC	3	-	-	8
Int. Potato Ag. (CIP)	-	-	6	19
German Technical Society(GTZ)	-	-	-	94
Rockefeller Brothers Fund(RBF)	-	-	-	25
Totals	$ 109	$ 98	$ 124	$ 178
Total-Other Restricted Resources	$ 347	$ 427	$ 701	$ 881

CATIE
COMPARATIVE BASIC BUDGET EXPENSES
FOR YEARS ENDING JUNE 30, 1974, 1975, 1976, AND 1977

(U.S. $000)

Description	Fiscal Years Ending June 30, 1974	1975	1976	1977
Crop and Tropical Soils Dept:				
International Professional Personnel	$ 142	$ 150	$ 173	$ 138
Local Professional and Auxiliary Personnel	14	23	23	22
Field and Laboratory Personnel	33	30	44	39
Operating Expenses	45	43	61	53
Total Crop and Tropical Soils Dept.	$ 234	$ 246	$ 301	$ 252
Forestry Science Dept:				
International Professional Personnel	$ 52	$ 83	$ 91	$ 97
Local Professional and Auxiliary Personnel	16	7	6	7
Field and Laboratory Personnel	13	9	10	9
Operating Expenses	46	30	26	29
Total Forestry Science Dept.	$ 127	$ 129	$ 133	$ 142
Tropical Cattle Dept:				
International Professional Personnel	$ 103	$ 125	$ 137	$ 140
Local Professional and Auxiliary Personnel	13	12	15	15
Field and Laboratory Personnel	5	5	4	2
Operating Expenses	9	14	24	18
Total Tropical Cattle Dept.	$ 130	$ 156	$ 180	$ 175
Secretarial and Teaching	$ 26	$ 27	$ 25	-
Directorate	30	35	55	70
Administration	36	36	41	48
Auxiliary, Laboratory and Public Relations	41	48	38	26
General Services:				
Central Files	9	11	11	4
Maintenance	21	22	85	82
Transportation	9	11	24	21
Other 1/	4	3	17	90
Total General Service	$ 43	$ 47	$ 137	$ 197
General Working Fund	$ 28	-	-	-
Total	695	724	910	910

1/ Includes Dining, Room, Vigilance, Building Maintenance, Electricity, Dorms and Laundry.

IMPLEMENTATION PLAN - CATIE (Project 596-0083)

Part I. CATIE Project Management and Activities Structure

The SFPS project will be administered through CATIE's general managerial, technical, and administrative structure, and with the specific delegations described below and shown on Chart ____.

(1) Director. The Director of CATIE will ultimately be responsible for the entire project and for coordinating the actions of the Sub-Directors and Associate Director, including the necessary corresponding relations at the ministerial level in the countries involved.

(2) Sub-Director for Research. The Sub-Director for Research will:

(i) Work with the Regional Rural Development Office of ROCAP (or a designee) to coordinate all project actions among the three Sub-Directorates; and

(ii) Have overall responsibility for the integrated implementation of the entire project and for the direct supervision and coordination of the research activities to be developed in the Annual Crops and the Cattle and Small Animals programs, as well as for the relations of the project with the regional committee, national institutions, and other participating institutions.

A coordination unit will be created under the Sub-Director for Research to monitor and coordinate CATIE's research projects, including the Small Farm Production Systems project. A person will be assigned to this unit with full-time responsibility to monitor all project activities and to assure that reports are prepared and resources are utilized in the most effective manner toward the achievement of project objectives.

The activities of the project will be carried out by the Annual Crops and the Cattle and Small Animals programs and the Sub-Directorate for Training and Technical Cooperation, separately or integrated as required, and will be implemented under the operational guidance of the program heads.

The program heads will:

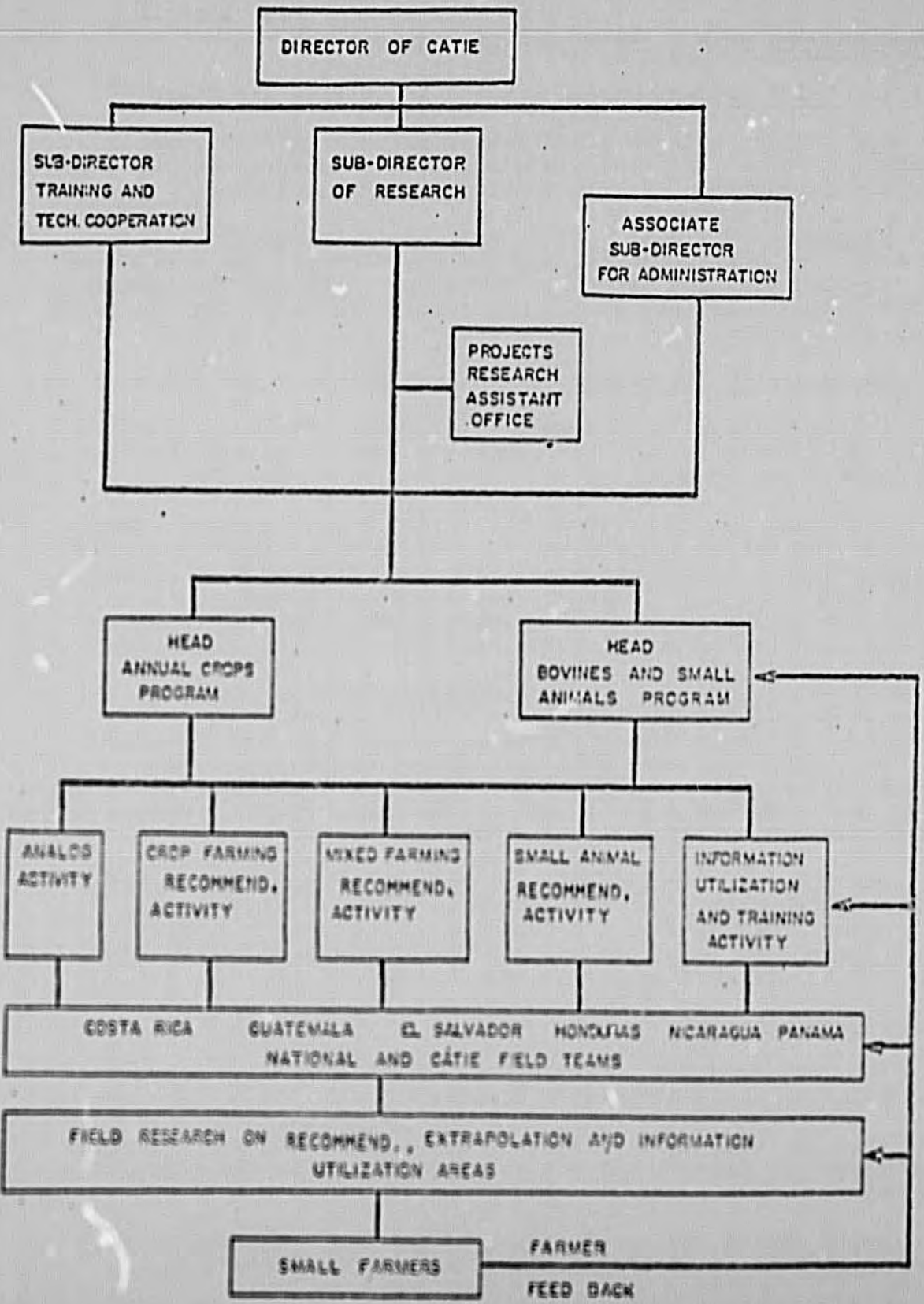
(i) Act as CATIE's operational coordinators for project activities in their respective fields;

(ii) Be responsible for the planning, execution and regular supervision of project activities at CATIE and in the cooperating countries;

(iii) Insure the coordination of the basic actions of each program as well as its relationship with other supporting

CHART _____

PROJECT MANAGEMENT AND ACTIVITIES STRUCTURE



projects (IDRC/CATIE, IDIAP/CATIE, etc.,) as they contribute to the accomplishment of the overall project objectives; and be responsible for administering the human, logistic, and financial resources assigned to their element of the project and for the development of each of the assigned outputs;

(iv) Be responsible for determining the cooperative actions to be conducted with the national research programs through committees or other organisms to be created under the project, assigning work responsibilities to their technical staffs, coordinating preparation of reports, and allotting assigned financial resources;

(v) Work closely with the ROCAP liaison officer, the national programs and the national committees.

Under the Sub-Director for Research, the Annual Crops and the Cattle and Small Animals program heads will consult on policies and problems and guide their interdisciplinary staffs and assigned consultants in the execution of the time-phased research activities. They will approve expenditures, refine work plans and deploy their staffs in the most effective manner to reach their research goals and collaborate with other CATIE Divisions as well as national and regional institutions on activities requiring coordination.

(a) Annual Crops, and Cattle and Small Animals Programs.

The heads of program will have the ultimate responsibility for all technical project design and implementation decisions. There will be a core staff located at CATIE and a resident technical staff in each cooperating country. Surveys, research plans, and analysis of data will take place either in the countries or at CATIE. The heads will be responsible for the development of all technical aspects of the production of tech-packs. The design of all research will involve this core staff, resident coordinators in each country, their counterparts, and consultants as appropriate. The staff assigned to carry out activities will consist of a core team located at CATIE. A resident technical coordinator will be located in each country to administer project field activities, except for the Cattle and Small Animals program which will only have one resident for each two contiguous countries.

The head will nominate new technical staff members to be appointed by CATIE's Director with ROCAP approval. The head will deploy the assigned staff in the most effective manner both at CATIE and in the countries.

The head will be responsible for meeting deadlines, assigning and revising technical reports, manuscripts, etc., and establishing activity operational norms. The Annual Crops, and Cattle and Small Animals heads will collaborate with their staffs in the conduct of the mixed-farming systems activities and the preparation of recommendation documents (i.e., tech-packs).

A Technical Information Utilization (TIU) staff will be located at CATIE and in (at least) three countries. A senior information specialist, under the head of the program, will be responsible for this activity and will coordinate the services of the anthropologist, statistician, and information transfer technican at CATIE. Short-term consultants and the three country TIU residents will work with their national information technical counterparts to design and test alternate methods of transfer, train national technicians, and otherwise implement the project.

The TIU activity staff will have the technical assistance of the Crops and Cattle and Small Animals research group for training purposes and for verification of the technical aspects of materials prepared from each cropping system tech-pack tested. The TIU staff will work closely with PIADIC and will call upon that project's mass media and other advisors as required for the preparation of materials, securing of cooperation of the mass media system, carrying out mass media actions, etc. They will, as appropriate, utilize the Basic Village Education project expertise (Guatemala) in preparing information for dissemination, and will utilize relevant research data developed by that project.

(3) Sub-Director for Training and Technical Cooperation. The Sub-Director for Training and Technical Cooperation, in coordination with the Sub-Director for Research and the heads of programs, will plan the training and the research transfer and utilization activities of the project, both at headquarters and in the countries.

(4) Associate Sub-Director for Administration. The Associate Sub-Director for Administration will respond to the Director of CATIE and will report to the ROCAP controller, or a designee, on financial and budgetary matters, coordinating project actions with the Sub-Director for Research and his staff, and will be responsible for assuring the proper expenditure of funds, for bookkeeping and reporting on the expenditures incurred in accordance with A.I.D. procedures, and for providing all support that the technical activities require in the administrative field, both at CATIE and in the countries.

This office will prepare appropriate monthly report on budgetary status for the information of CATIE and ROCAP officers involved. An annual report of financial obligations and disbursements will be prepared in a form acceptable to ROCAP. An independent audit report, made yearly, will be submitted through the Director of CATIE for ROCAP information.

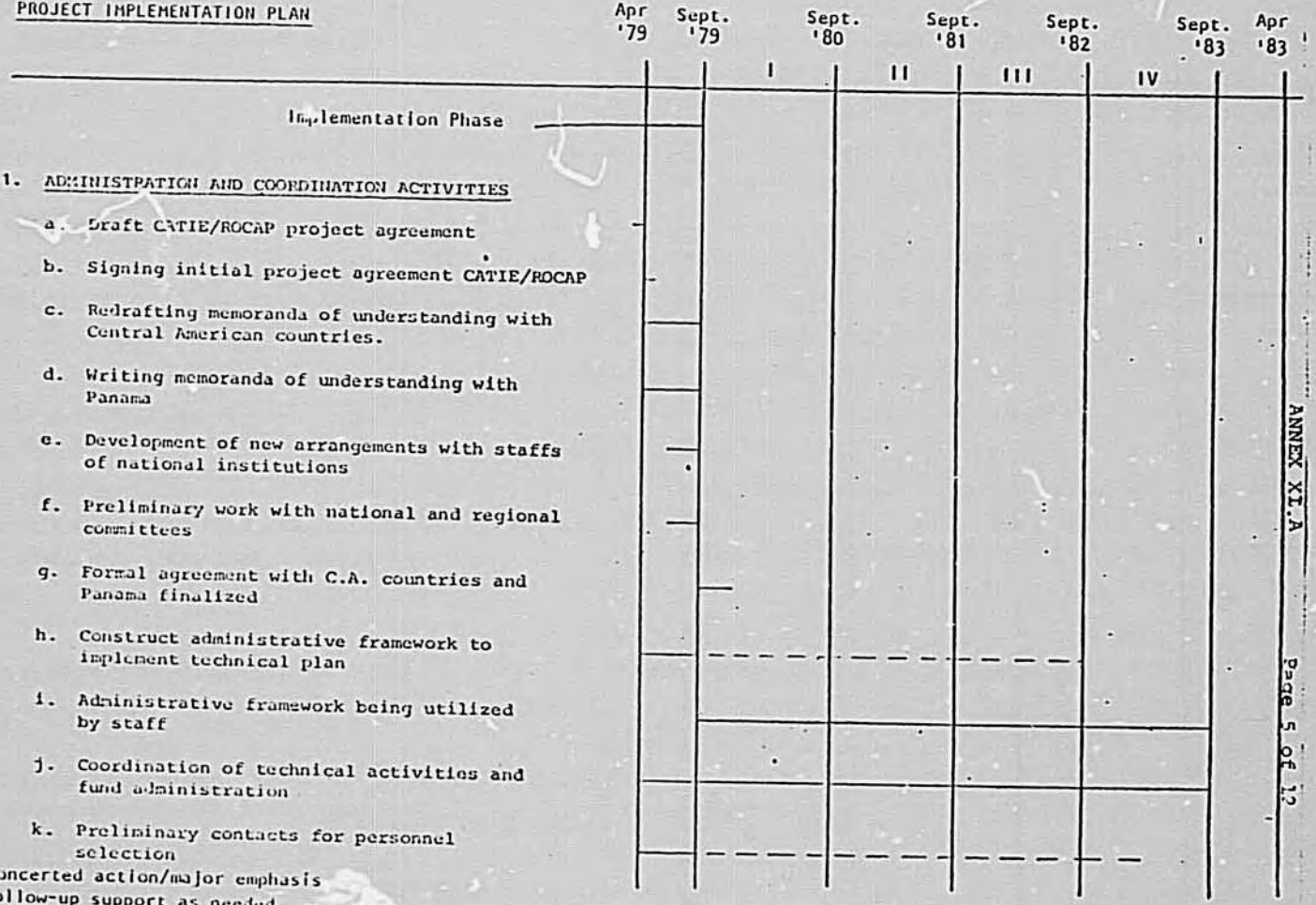
By written agreement with the ROCAP Office of Controller, the financial management guidelines will be coordinate to ensure that the necessary A.I.D. monitoring and project control requirements are met.

Part II. CATIE Detailed Implementation Plan

The following chart describes in graphic form the sequence and period of major events under Project 596-0083. An event-by-event explanation is on file at ROCAP.

CATIE - Project 596-0083

PROJECT IMPLEMENTATION PLAN



l. Final selection and travel arrangements of personnel and dependants

m. Budgetary transfer of technical staff for cropping system project to new

n. Resident coordinators in countries and technical staff in CATIE

o. Purchase of equipment and vehicles

p. Development of animal facilities

q. Purchase of research animals

r. Quarterly meetings national committees

s. Quarterly progress reports

t. Annual review and programming meeting with regional committee

u. Annual report

v. Compilation of results to farm project outputs

w. Plan and execute final report

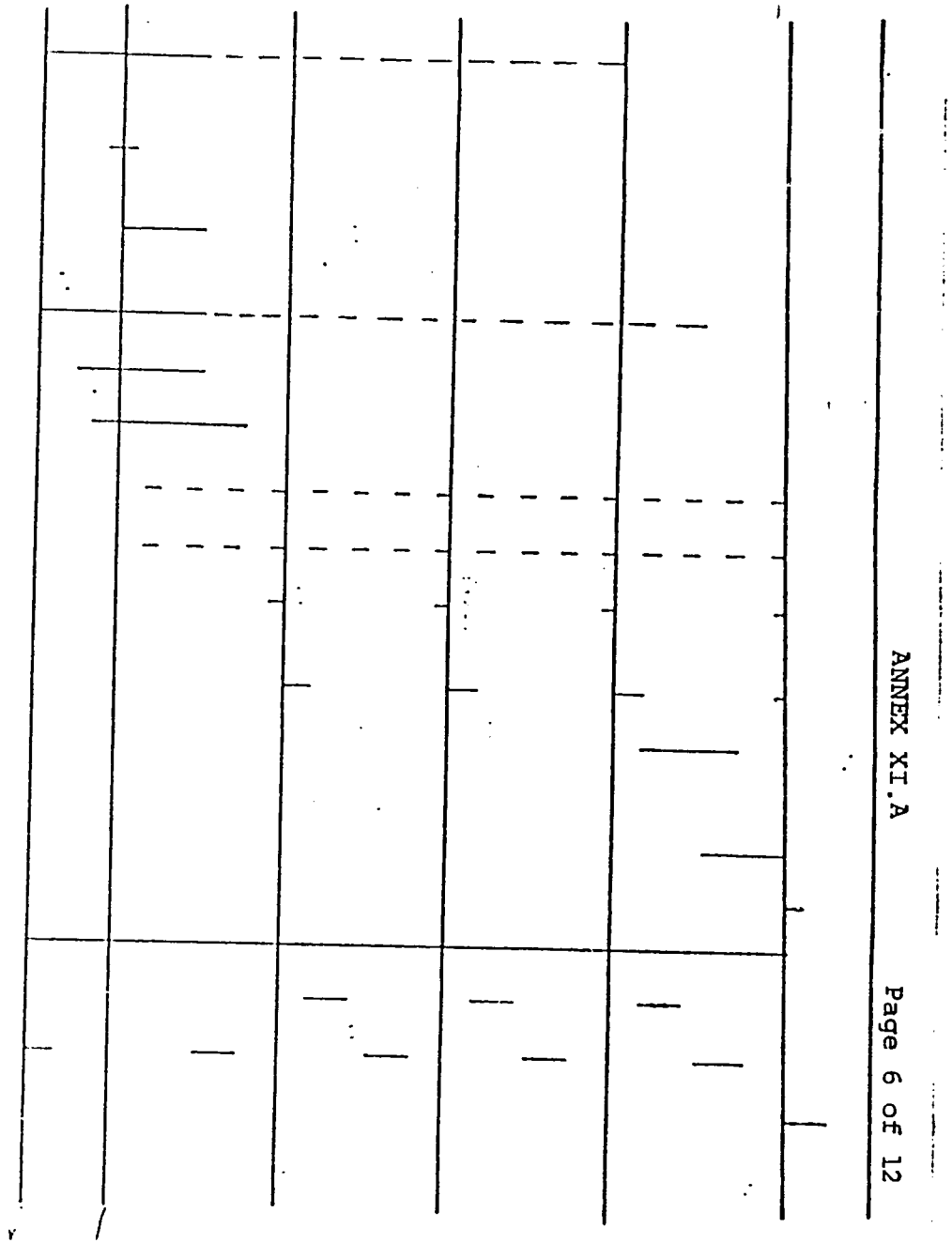
x. Demobilization of staff

y. Project monitoring by ROCAP

z. Annnual project evaluation by ROCAP

Annual ROCAP obligation of funds

Final project evaluation by ROCAP



2. FARMER RECOMMENDATION - CROPPING SYSTEMS

a. Gathering of soil analog data - CATIE-PIADIC

b. Gathering of climatological data from secondary sources - CATIE-PIADIC

c. Gathering of census, socio-economical and market data, secondary sources

d. Refinement of criteria for selection of primary target areas with National Institutions

e. Selection of target areas for cropping systems Tech-Packs

f. Environmental, socio-economic and technical baseline study

g. Formal report on baseline study

h. Technical planning meeting to program research activities

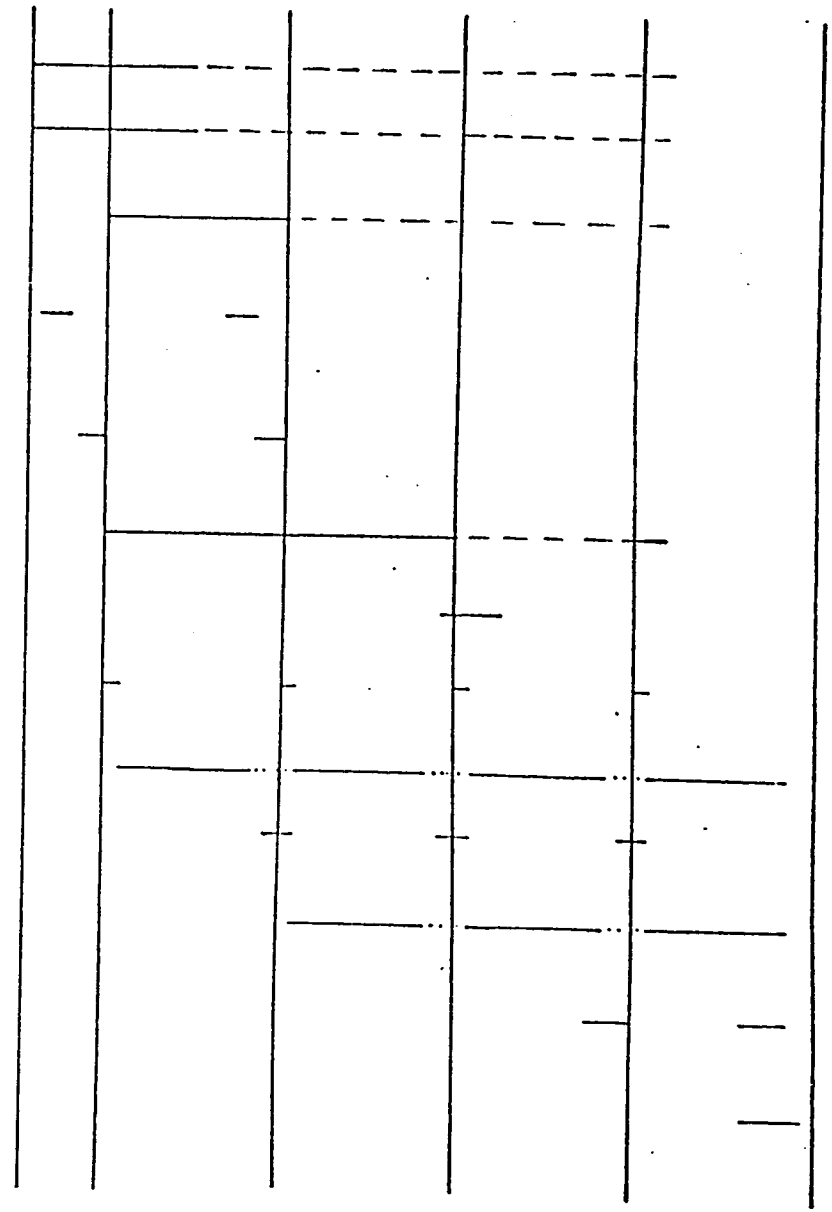
i. Conduct field research on cropping systems

j. Workshop for research evaluation and design of first approximation Tech-Pack

k. Conduct field - research on evaluation of first approximation Tech-Pack

l. Workshop to produce Tech-Packs in final form

m. Make available to national institutions the cropping systems



n. Make available to national institutions Tech-Pack development methodology guidelines

3. FARMER RECOMMENDATION - ANIMAL SYSTEMS

a. Gathering of climatological data from secondary sources - CATIE-PIADIC

b. Gathering of census, socio-economic and market data from secondary sources

c. Development of criteria for selection of primary target areas.

d. Selection of target areas for animal systems Tech-Packs

e. Environmental, socio-economic and technical baseline study

f. Formal report on baseline study

g. Technical planning meeting to program research activities

h. Conduct field research on components of animal systems

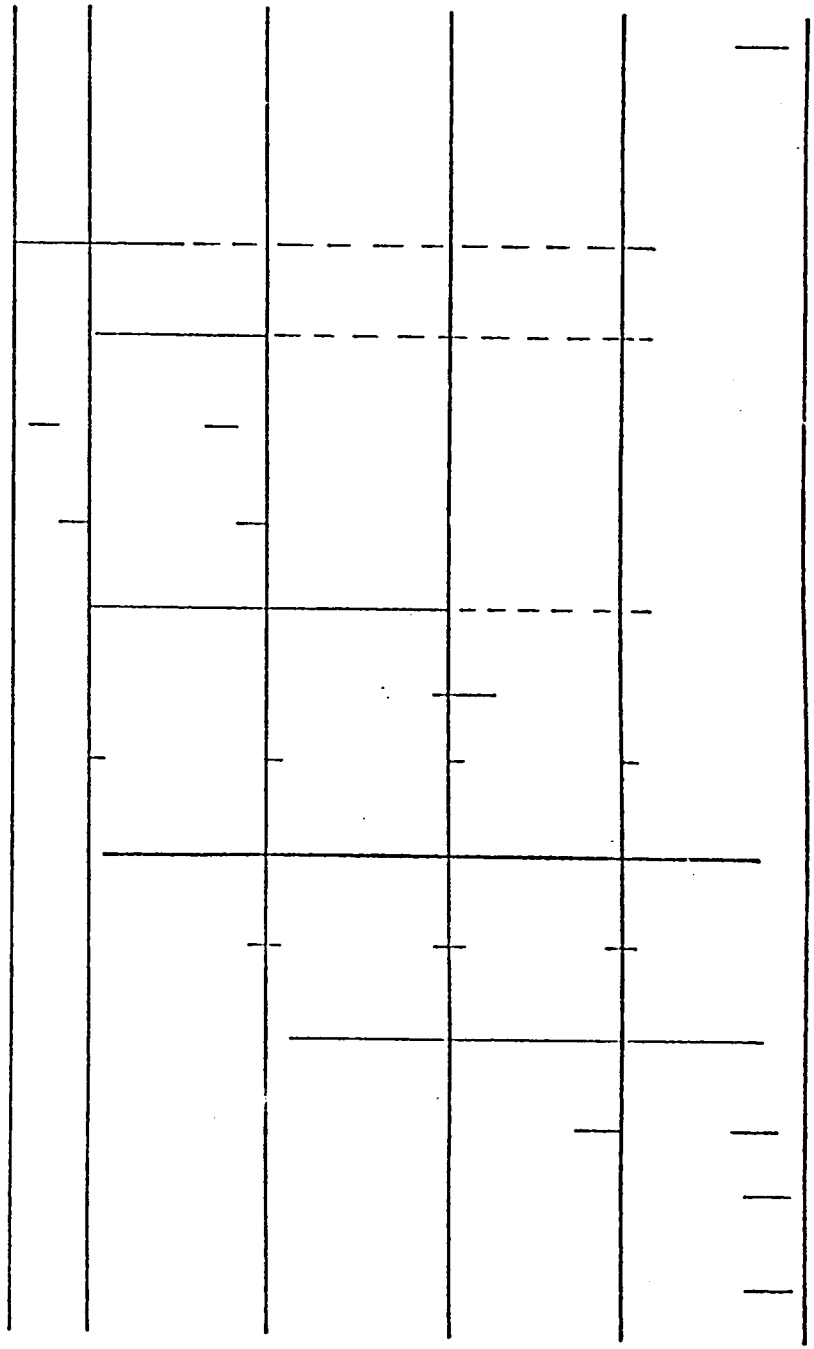
i. Workshops for research evaluation and first approximation Tech-Packs

j. Conduct field research on evaluation of first approximation Tech-Packs

k. Workshops to produce Tech-Packs in final

l. Make available to national institution the animal systems

m. Make available to national institutions Tech-Pack development methodology guidelines



4. FARMER RECOMMENDATION - MIXED SYSTEMS

a. Gathering of soil analog data CATIE-PIADIC

b. Gathering climatological data from secondary sources CATIE-PIADIC

c. Gathering of census, socio-economic and market data from secondary sources

d. Development of criteria for selection of primvary target area

e. Selection of target areas for mixed systems Tech-Packs

f. Environmental, socio-economic and technical baseline study.

g. Formal report on baseline study

h. Technical planning meeting to program research activities

i. Conduct field research on components of mixed systems

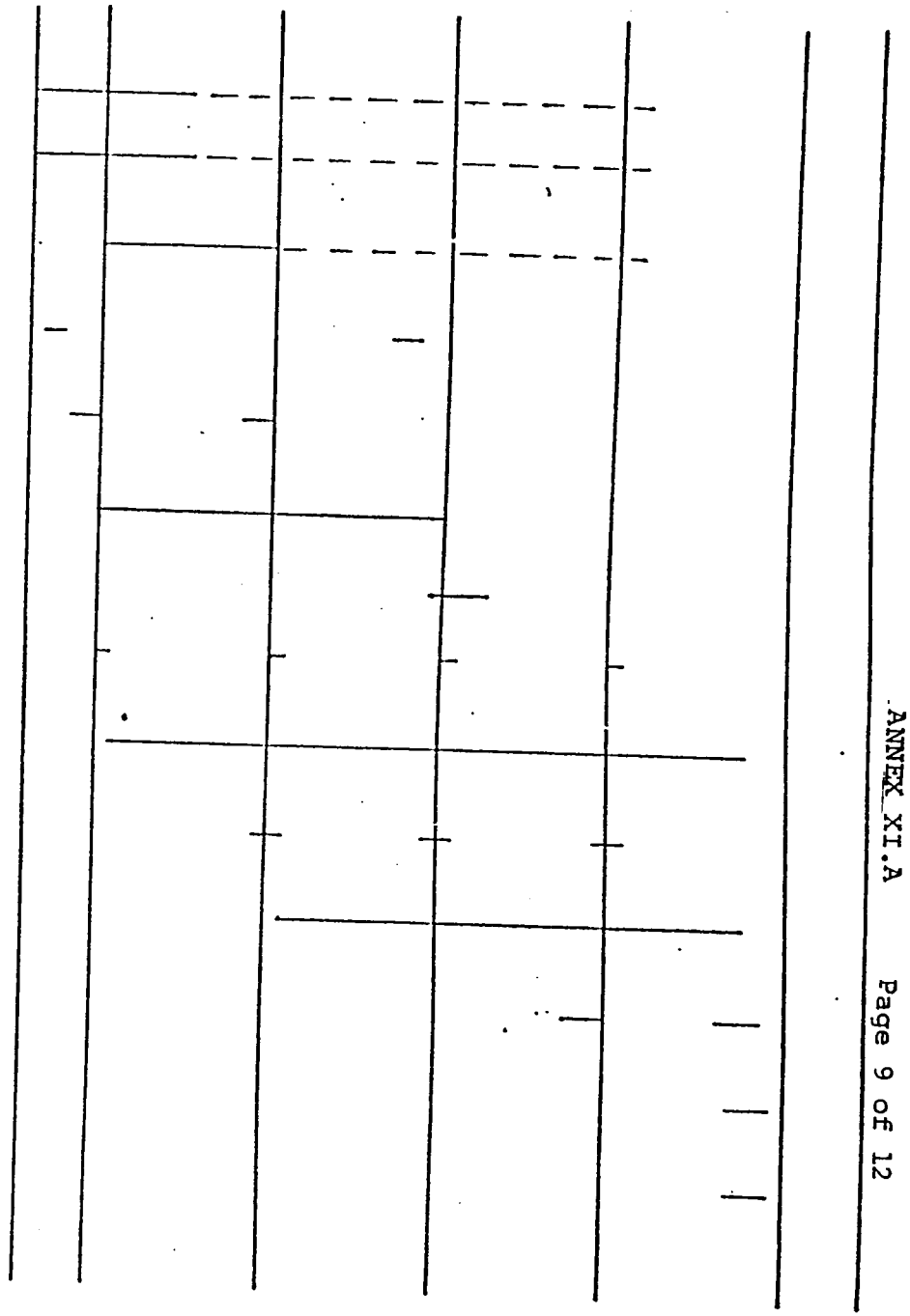
j. Workshop for research evaluation and design of first approximation Tech-Packs

k. Conduct field research on evaluation of first approximation Tech-Packs

l. Workshop to produce Tech-Packs in final form

m. Make available to national institutions the mixed systems

n. Make available to national institutions Tech-Pack development methodology guidelines



5. EXTRAPOLATION METHODOLOGY

a. Gathering soil analog data from secondary sources CATIE-PIADIC

b. Gathering climatic data from secondary sources CATIE-PIADIC

c. Gathering of census, socio-economic and marketing data from secondary sources

d. Development of criteria for selection of primary target areas.

e. Selection of primary target areas

f. Analyzing enfironment of primary target areas

g. Meeting for planning research on primary target areas.

h. Selecting sites within primary target areas

i. Conduct field research on primary target areas

j. Selection of secondary target areas.

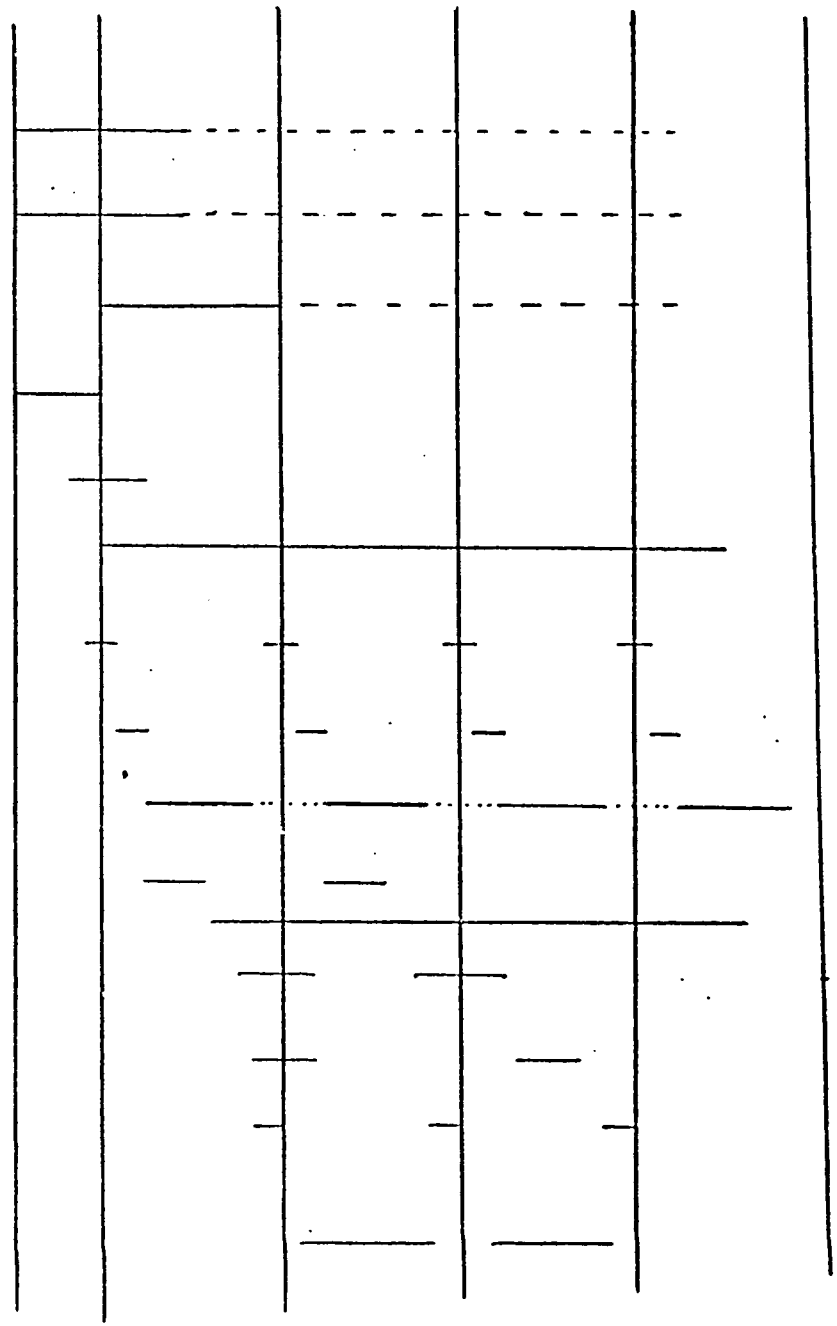
k. Analyzing environment of secondary target area

l. Analyzing environment- cropping system performance data relationships

m. Analyzing location to location relationship between primary and secondary target areas

n. Planning research action at secondary target area

o. Testing predictability of cropping system performance on secondary target area



p. Evaluation of the potential of approaches for extrapolation research

q. Final field evaluation of extrapolation methodology

r. Summarizing and making available extrapolation methodology to national institutions

6. TRAINING

a. Divulgation of availability of scholarships to national institutions

b. Reception of admission applications to the graduate school

c. Final selection of candidates

d. First group undertake graduate courses

e. Second group undertake graduate work

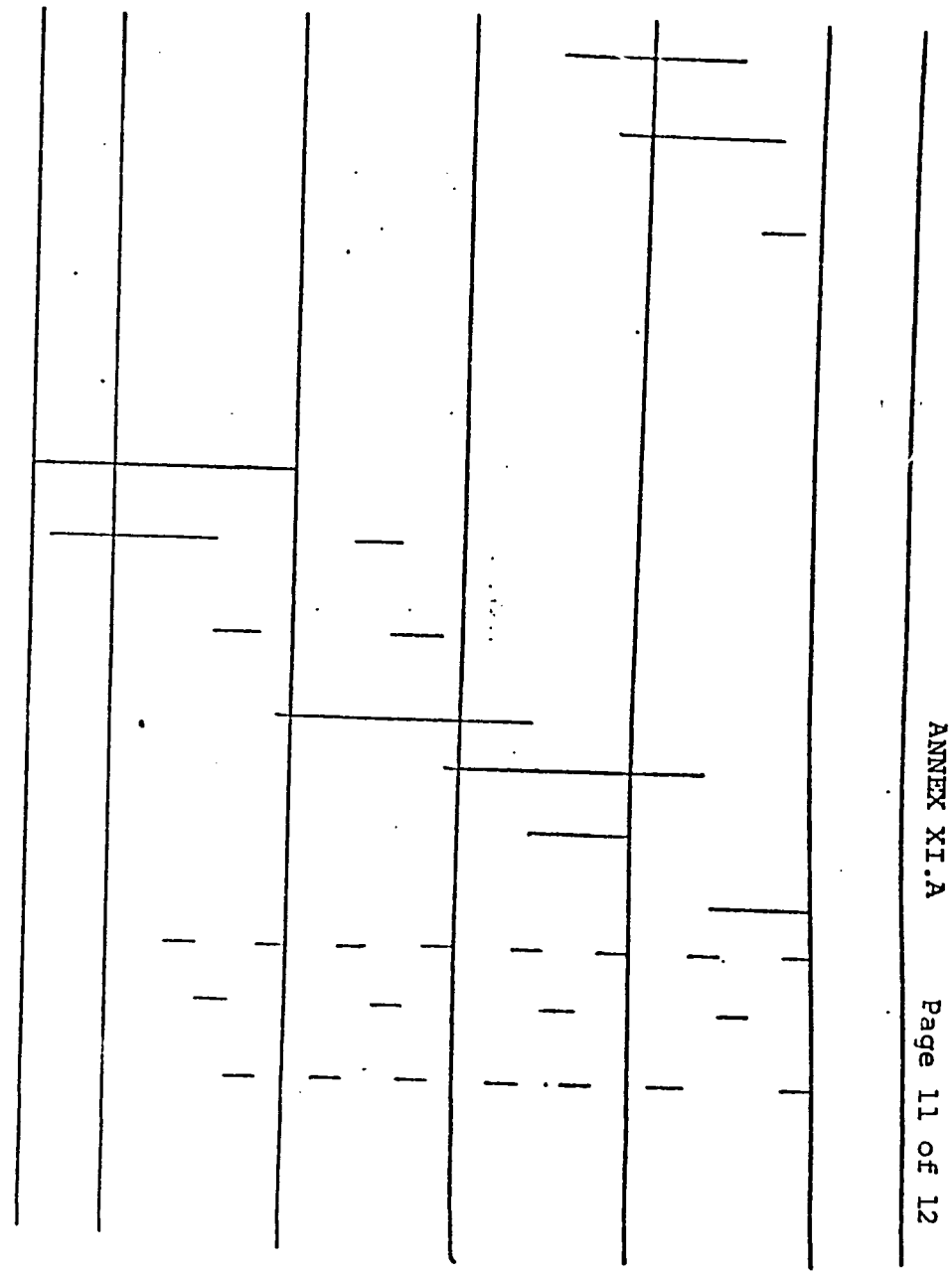
f. First group conduct and complete thesis work

g. Second group conduct and complete thesis work

h. Short courses on cropping systems research

i. Short courses on animal systems research

j. Short courses on information transfer



7. RESEARCH/TRANSFER UTILIZATION

a. Contacts with national institutions

b. Site selection

c. Identification of collaborating transfer institutions

d. Organization

e. Planning for implementation

f. Training and staff development

g. Local contacts

h. Initial baseline survey

i. Message development

j. Scheduling of message content

k. Preparation and production of materials

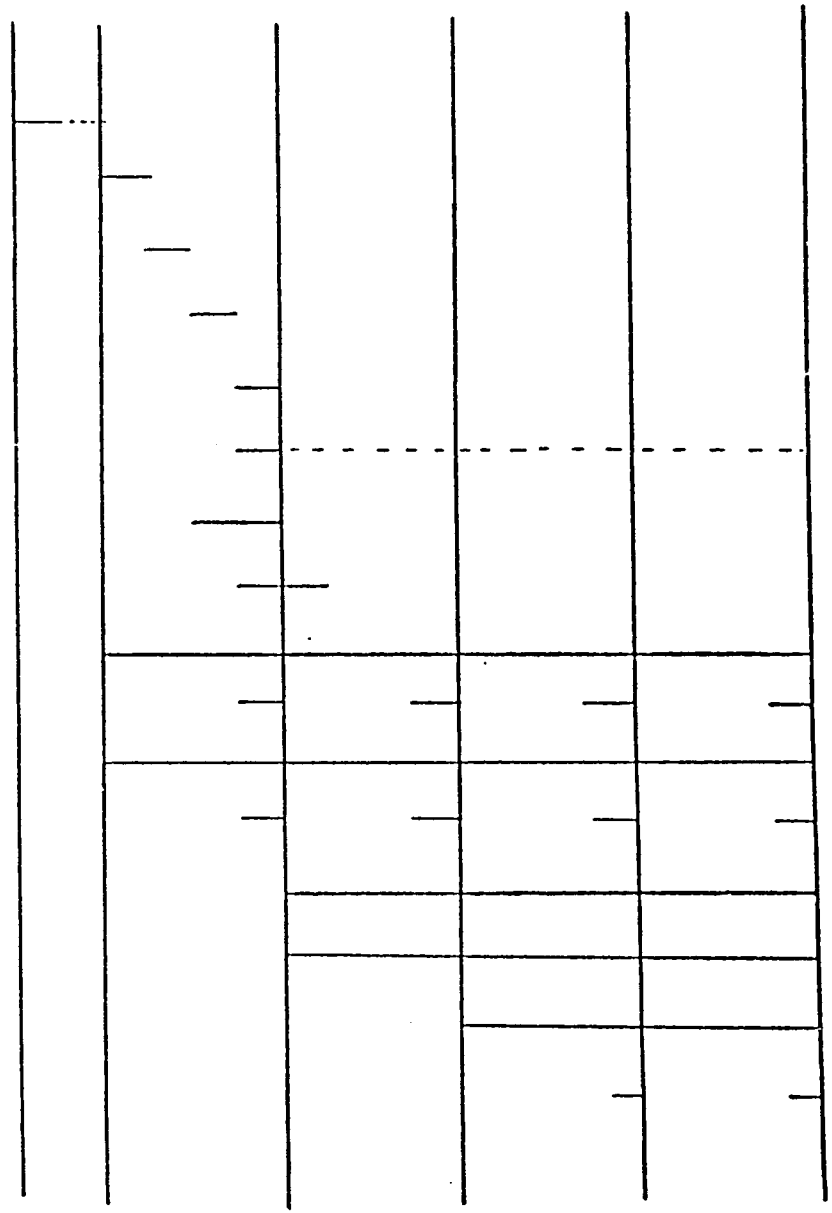
l. Initial information campaign

m. Demonstration and reinforcement

n. Feedback

o. Follow-on

p. Re-survey



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August 1, 1978

IICA/PIADIC - Project 596-0048

SUMMARY IMPLEMENTATION PLAN

———— Special emphasis (training and technical assistance)
---------- Follow-up or start-up assistance

SUMMARY OF PIADIC/CA USAID RELATIONSHIPS

In varying degrees, all missions expressed support of proposed PIADIC activities during the "Extended" phase of the project. RDO's expressed opinions that PIADIC design assures technical assistance, methodologies, standardized formats and systems can be provided to support and strengthen national and regional programs, supported or planned by USAID projects, that will use the services of, or provide input into, the National Agricultural Information Systems being promoted in each country. The following table lists USAID projects where PIADIC outputs are relevant to their needs.

Using the FY 80 ABS submission, each USAID project was analyzed in terms of a user of information services or a producer of data/information that should be banked for analysis and recall. ROCAP discussions with the RDO's confirmed the general validity of our diagnostic treatment of their ABS submissions.

From a regional standpoint the following statistics come forth:

1. Area Frame Use

23 USAID projects will need commodity production data

33 can use socio-economic information that could be obtained through this methodology.

2. A. Data Base Development and Use

20 projects in the region need or will produce natural production determinants.

27 will produce information for or call on the services of biological and production technology data bases.

29 USAID projects will deal with socio-economic data bases, as major components of their programs.

?0 will depend upon market intelligence service or produce data that should be stored in these bases.

B. Data Interpretation and Use

34 USAID projects could use specific small farmer profiles or will produce data that should be coded into these.

23 projects in the region profess the need to develop farmer recommendations.

3. Specialized Information Centers

39 projects in Central America and Panama will use these links to known national and world information; most of the 39 will produce biological or technical information that should be banked at centralized points for ready recall and use.

4. Information Management Projects

Several USAID projects carry components for information management but not on the scale to properly handle the information needed or that will be produced in the above USAID projects. Special information management systems need to be developed for each country to move this information in a uniform efficient manner. This can only be done with active USAID and other donor support. For the country level state-of-the-art it is not an exaggeration to suggest that at least one half of all project funds should be spent for purely information management processes. Each year this amount could be reduced and greater cost/benefits received from these investments. Information management is a science, and must be treated as one of the several research efforts within the ag sector. Very few will return a higher return for dollar spent.

USAID PROJECTS IN RELATION TO PIADIC OUTPUTS

	PIADIC AREAS	Costa Rica	El Salvador	Guatemala	Honduras	Nicaragua	Panama	Number of CA/USAID Projects
1.	AREA FRAME USE							
	Production	4	4	3	4	4	4	23
	Soc/Econ.	6	8	5	4	6	4	33
2.	DATA BASES							
	A. Development							
	Nat. Prod. Determin	2	4	4	4	3	3	20
	Sci/Tech.	4	4	5	4	6	4	27
	Soc/Econ.	5	8	4	3	6	3	29
	Mkt/Comm.	2	4	4	1	4	5	20
	B. Use							
	Profiles	6	9	6	4	6	3	34
	First Approxi-mation Farmer Recommendations	4	5	5	3	3	3	23
3.	INFO CENTERS	6	10	7	4	6	6	39
4.	INFO MANAGEMENT	In Panama, Honduras and Nicaragua specific support projects have been written for USAIDs. In Costa Rica and Guatemala first draft copies have been developed for the CNC's. USAID/El Salvador will ask for assistance next year.						

COUNTRY OVERVIEWS

PIADIC ACTIVITIES UNDER PROJECT 596-0048

1. General

In addition to the Regional Interinstitutional Advisory Committee composed of representatives of eight principal regional organizations, six regional committees representing all the countries are active in agricultural research and extension, agricultural sector planning, marketing, statistics, and the regional information system. Additionally, national coordinating committees are active within each country. Represented on the country committees are responsible officials from those agencies concerned with agricultural research, marketing, financing, production, and planning information. IICA's country representatives sit on the committees in their respective countries. Vis-a-vis the specific technical areas dealt with by the project, each country has its own priorities which the project both influences and accomodates itself to. Furthermore, each country is at a different level of development in each technical area so that project assistance has varied from country to country, tailored to the particular needs and priorities of the country (for example, at the time Panama joined the project, that country already had an area sampling frame sample for rural surveying so the project has concentrated on improving that frame and assisting in its use; conversely, Honduras had never developed a sampling frame, so the project there has been working on basic training of technicians to begin construction of a frame). Thus, while there has been progress in all countries in all technical areas, the current status of any country depends on its original starting point, the capacities of its technical staffs, availability of requisite facilities, budget support for priority project activities, organization for project work, and the priorities it established for its own needs. Presented below is a country-by-country summary of project activity and progress to date.

2. Costa Rica

Project activities have been guided and coordinated by the national committee representing eight key national agencies concerned with agricultural research, planning, credit,

statistics, technology, and production. Participation in the project has gone beyond the sector level to include the office of the President which has taken an active interest. The project staff has assisted national technicians in constructing the area sampling frame which is ready for field testing. This will be done through a pilot survey covering the Central Pacific zone. The Central Bank has approved funding for this test survey and questionnaires have already been developed and field tested. The project-promoted concept of multi-disciplinary, area-specific farmer recommendations tailored for small farmers has been accepted by the national committee. A plan for the national agricultural information system has been developed identifying participating agencies and defining coordinated roles. Some twenty technicians have received training in operation of a national information centers network and are currently engaged in establishing such a network. Participants in the network include the National Production Council and the Agricultural Sector Planning Office (marketing information), the two national universities and the Ministry of Agriculture (research and technological information), the Bureau of the Census and the University of Costa Rica's Economic Faculty with the Agricultural Planning Office (statistical data), and the Polytechnic-Cartago (national reference center). The Ministry of Agriculture's Sector Planning Office will serve as the central data bank. Special training has been provided in standardized methods of managing and controlling documentary information. The basic manual for numerical data processing, storing, retrieval, analysis, and packaging has been prepared and is now undergoing operational testing. And recommendations have been prepared for specific technical projects to be developed by Costa Rican technicians with the assistance of project staff. The project staff is currently working with USAID/Costa Rica in developing a bilateral project dealing with basic rural sector information needs. That project will address parallel concerns including rural statistics, national information centers, and the analytical use of data for assessing the impact of developmental efforts.

PIADIC efforts during the extension period (79-81) in Costa Rica will concentrate on those activities that most directly support research and investigation activities. PIADIC will continue to work with OPSA, CNC and the Director General de Estadísticas y Censos to make the sample frame functional. PIADIC and third country technicians will be available to assist this source of valid data gathering. CIDIA personnel will continue efforts with the CNC to form a national agricultural information (sector data bank) system.

CIDIA and PASA technicians will assist OPSA, CONICIT, UCR, MAG and UNA in their efforts to form sector or special area information networks. Considerable effort has gone into making these into technical information centers (1) through providing world-wide connections, (2) promoting Ing. Agronoms to be assigned to assist users, and (3) encouraging an active outreach program based upon user profiles. This effort will continue; special financial assistance is, however, called for.

CNP has not finished its information inquest in order to "capture" information and get it into the specialized information center/system. PIADIC efforts will continue with other specific data bases such as climate, soils, and technology levels, using PASA, university contracts, IICA staff and third-country professionals.

Detailed work plans and outputs are on file at ROCAP.

3. El Salvador

Representatives of seven agencies with responsibilities in the agricultural field constitute the national coordinating committee which is guiding project activities. El Salvador is the most advanced of the countries in the area frame sample surveying for collection of socio-economic data at the small farm level, and generally has been more active in other project areas than most of the other countries. The frame has been completed and is regularly employed in the surveying upon which national estimates are based. The coordinating committee has accepted the project's methodologies and, with the technical assistance of the project staff, national technicians have documented farmer recommendation requirements and priorities. Development of the national information center network is underway with the participation of the Directorate of Agricultural Economics, the Institute of Food Supplies, and the Directorate of Trade Promotion (marketing information), the National Center for Appropriate Technology and the university's Faculty of Agronom (research and technology), the Ministry of Agriculture and the Directorate of Agricultural Economics (statistical data), the Science and Technology Program (national reference center), and with the Directorate of Agricultural Economics functioning as the national data bank for agricultural information. Twenty technicians from these participating agencies have been trained in information centers networks and are working to develop the system. Special training has been provided in numerical and

documentary information control, and descriptor lists for the national thesaurus have been developed. The thesaurus is th essential compendium of coding and classification information permitting rational and retrievable storage of information in a standard manner. As such it is a basic tool of data control technicians. Working with the project staff national technicians have identified priority project needs and have prepared proposals for those projects.

PIADIC efforts during the extension period (79-81) in El Salvador, will concentrate on those activities that most directly support research and investigation activities. PIADIC will continue to work with Dirección General de Economía Agrícola and Instituto Regulador de Abastecimientos, to make the sample frame functional. PIADIC and third country technicians will be available to assist this source of valid data gathering. IICA staff and CIDIA personnel will continue efforts with the CNC to form a National Agricultural Information (sector data bank) system. The first approximation has not been written for financial assistance.

Considerable emphasis is being placed on the use of the area frame and other known methods to assist local agencies in gathering technology use indicators, and identifying levels of live benchmarks. PIADIC is now being staffed to guide these activities, with assistance from IICA, and local hires.

CIDIA and PASA technicians will assist CENTA, Recursos Naturales, Escuela de Agronomía, CENAP, Ministerio de Planificación in their efforts to form sector or special area information networks. Considerable effort has gone into making these into technical information centers, (1) through providing world-wide connections, (2) promoting Ing. Agronoms to be assigned to assist user, (3) and encouraging an active outreach program based upon user profiles. This effort will continue special financial assistance is, however, called for.

IRA is expected to receive PIADIC assistance to "capture" the information and get it into the specialized information center/system. PIADIC efforts will continue with other specific data bases such as climate, soils, and technology levels, using PASA, University contracts, IICA staff and third-country professionals.

4. Guatemala

Guatemala's program was slow getting started, the national committee taking about a year to properly focus project

activities and effect the necessary institutional coordination. Guatemala's national coordinating committee is jointly headed by the Vice-Minister of Agriculture and the Vice-Minister of Economy, with representatives of six additional agencies concerned with agricultural research and information. National technicians have been trained in and are establishing a national network including the Agricultural Trade Institute (marketing), the National Planning Ministry (the national reference center), the Ministry of Agriculture's Sector Planning Unit (statistics), and the Institute of Agricultural Science and Technology and the University's Faculty of Agronomy (research and technology -- ICAITI and INCAP, both headquartered in Guatemala, also contribute to the national system with technological information). The Agricultural Sector Planning Unit serves as the sector data bank. A national team has been formed to develop the area sampling frame. The team has been given basic training by the project staff and is proceeding with construction of the frame. Questionnaires are now being developed for a pilot survey in Region 1. The national committee has endorsed the multidisciplinary farmer recommendation methodology for implementation. Descriptor lists for the national thesaurus have been prepared and national technicians have been trained in project-fostered standard methods of data management and control.

PIADIC efforts during the extension period (79-81) in Guatemala will concentrate on those activities that most directly support research and investigation activities. PIADIC will continue to work with UPSA, the Ag. Commission on Statistics, and Census to make the sample frame functional. PIADIC and third country technicians will be available to assist this source of valid data gathering. IICA staff and CIDIA personnel will continue efforts with the CNC to form a national Agricultural Information (sector data bank) system. A proposal to support such a system has been written and financial assistance is being sought.

Considerable emphasis is being placed on the use of the area frame and other known methods to assist local agencies in gathering technology use indicators and identifying levels of life benchmarks. PIADIC is now being staffed to guide these activities, with assistance from IICA, and local hires.

CIDIA and PASA technicians will assist ICTA, DECA, INDECA, USC, INTECAP in their efforts to form sector or special area information networks. Considerable effort has gone into making

these into technical information center, (1) through providing world-wide connections, (2) promoting Ing. Agronoms to be assigned to assist users, and (3) starting active outreach programs based upon user profiles. This effort will continue, special financial assistance is, however, called for.

INDECA has finished its information inquest and will receive assistance to "capture" the information and get it into the specialized information center/system. PIADIC efforts will continue with other specific data bases such as climate, soils, and technology, levels, using PASA, University Contracts, IICA staff and third-country professionals.

5. Honduras

Honduras' program was delayed initially by a dirth of competent technicians as well as by limitations on national budget support for key activities addressed by the project. Ten national agencies now are contributing to the development of Honduras' national program through representation on the national coordinating committee. The committee is chaired by the Director of the Sector Planning Directorate in the Ministry of Natural Resources with members from the Economic Planning Council, the Forestry Development Corporation, the National Development Bank, the national Coffee Institute, the Directorate of Census and Statistics, the Cooperatives Development agency, the Honduras Banana Corporation, and the National Agrarian Institute. Honduras has organized a special team to develop the area sampling frame; the team is being assisted by project technicians in the first stages of constructing the sampling frame for Honduras. The national committee has adopted project methodologies for farmer recommendations and collection of basic descriptive data for area-specific profiles is underway through the South Border Development Project. The national information centers network is being developed by project-trained technicians with the participation of the University's Faculty of Agronomy and the Honduran-based Pan American School (research and technological information), the Honduran Agricultural Marketing Institute (market information), and the Secretariat of Natural Resources (statistics and sector data bank -- the Secretariat contributes also to marketing and technological information). The Central Bank serves as the national reference center. Recommendations for specific projects have been prepared by national technicians with project staff assistance, descriptor lists for the national thesaurus have been completed, and basic training in standard control procedures for documentary information have

been provided by project technicians. USAID/Honduras currently is considering expanding or refocusing its bilateral efforts to augment project-supported endeavors; initial consultations between the Mission and project staff have tentatively identified agricultural statistics and appropriate farm technology as areas of possible interest.

PIADIC efforts during the extension period (79-81) in Honduras will concentrate on those activities that most directly support research and investigation activities. PIADIC will continue to work with Ministerio de Recursos Naturales and the Director General de Estadísticas y Censos to make the sample frame functional. PIADIC and third country technicians will be available to assist this source of valid data gathering. IICA staff and CIDIA personnel will continue efforts with the CHC to form a national agricultural information (sector data bank) system. A proposal to support such a system has been written and financial assistance is being sought.

Considerable emphasis is being placed on the use of the area frame and other known methods to assist local agencies in gathering technology use indicators and identifying levels of life bechmarks. PIADIC is now being staffed to guide these activities, with assistance from IICA, and local hires.

CIDIA and PASA technicians will assist Recursos Naturales, EAP, Banco Central, UNAH, and the Ministerio de Exterior in their efforts to form sector or special area information networks. Considerable effort has gone into making these into technical information centers (1) through providing world-wide connections, (2) promoting Ing. Agronoms to be assigned to assist users, and (3) starting active outreach programs based upon user profiles. This effort will continue, special financial assistance is, however, called for.

IHMA has finished its information inquest and will receive PIADIC assistance to "capture" the information and get it into the specialized information center/system. PIADIC efforts will continue with other specific data bases such as climate, soils, and technology levels, using PASA, University contracts, IICA staff and third-country professionals.

6. Nicaragua

The project activities in Nicaragua are guided by the national coordinating committee representing the Ministry of Agriculture, the Agricultural Technology Institute, the Office of Surveys and Census, and the Central Bank (along with

the head of IICA's Nicaraguan office). The committee has accepted the tech pac methodology and priority regions for area-specific tech pacs have been selected. A preliminary proposal for a national market news service has been prepared and the Institute of Internal and External Commerce will be responsible for developing and operating that information service. The area frame is not completed for all parts of the country but has been constructed for the country's major areas of agricultural production. Questionnaires have been developed and tested, and pilot surveys are being carried out. National technicians have received project training in documentary information management and have developed the basic classification lists for the national thesaurus. Special project needs have been identified and project proposals prepared. The Agricultural Sector Planning Directorate has been given principal responsibility for developing the national information centers network and the concerned personnel in participating agencies have received project training in network operations. Nicaragua's network includes the Nicaraguan Institute of Agricultural Technology, the Institute of Rural Welfare, the Agrarian Institute, and the Central Bank (research and technological information), and the Institute of Commerce market information). The Agricultural Sector Planning Directorate is responsible for statistical data and for the national reference center and sector data bank. National turmoil on the national scene delayed project activities during CY 1978. Project staff is consulting with USAID/Nicaragua on how the project can best fit into on-going USAID activities in that country.

As appropriate, PIADIC efforts during the extension period (79-81) in Nicaragua will concentrate on those activities that most directly support research and investigation activities. PIADIC will continue to work with DIPSA and OEDEC to make the sample frame functional. PIADIC and third country technicians will be available to assist this source of valid data gathering IICA staff and CIDIA personnel will continue efforts with the CNC to form a National Agricultural Information (sector data bank) System. A proposal to support with a system has been written and financial assistance is being sought.

Considerable emphasis is being placed on the use of the area frame cries, and other known methods to assist local agencies in gathering technology use indicators and identifying levels of life benchmarks. PIADIC is now being staffed to guide these activities, with assistance from IICA, and local hires.

CIDIA and PASA technicians will assist DIPSA, INTA, INCEI, Banco Central, UCA in their efforts to form sector or special area information networks. Considerable effort has gone into making these into technical information center, (1) through providing world-wide connections, (2) promoting Ing. Agronoms to be assigned to assist users, and (3) starting active outreach programs based upon user profiles. This effort will continue, special financial assistance is, however, called for.

INCEI will soon start its information inquest and will receive PIADIC assistance to "capture" the information and get it into the specialized information center/system. PIADIC efforts will continue with other specific data bases such as climate, soils, and technology levels, using PASA, University Contracts, IICA staff and third-country professionals.

7. Panama

Although Panama joined the project about a year after the other countries, it was already more advanced in developing an agricultural information system than some of them and the project has assisted in promoting further development in accordance with the standard methodologies which will facilitate Panama's agricultural information exchange with the other Central American countries. Panama's program was given special emphasis by the assignment of a full-time coordinator from the project staff for a year to help bring Panama on stream with other participants. Six principal agencies are represented on Panama,s national coordinating committee which is promoting tech pac production pursuant to project-promoted methodologies. Work is underway to develop the data base material and the area profiles for tech pacs. A project-trained technical team is now preparing preliminary recommendations for two regions; in one, needs are being defined and analyzed, and in the other adapted technologies are being explored. Panama has a completed area sampling frame sample which project technicians are working to improve; a project has been developed to update the frame and enlarge its scope. Training and assistance have been provided in use of the frame for surveying. Basic work is underway to determine information needs at both the national and small farm levels. National technicians have been trained in network operations among the Census Department (statistical data), the Pan American Institute for Agricultural Research and the national University's Faculty of Agronomy (research and technological information), and the Institute of Agricultural Marketing

(market intelligence). The Census Department will be responsible for sector data banks and the Ministry of Planning will serve as the national reference center. Training has been given to selected technicians in the participating network agencies in standardized management and control methods and national thesaurus lists have already been developed. Preliminary work has started on upgrading and standardizing numerical data processing, control, analysis, and packaging. Project staff is consulting with USAID/Panama in the development of a bilateral project to improve information in the agricultural sector including rural statistics, use of research data, and the operations of national information centers.

PIADIC efforts during the extension period (79-81) in Panama will concentrate on those activities that most directly support research and investigation activities. PIADIC will continue to work with Ministerio de Desarrollo Agrícola, Contraloría de la República and Dirección de Estadísticas y Censos to make their sample frame more functional. PIADIC and third country technicians will be available to assist this source of valid data gathering. IICA staff and CIDIA personnel will continue efforts with the CNC to form a National Agricultural Information System. A proposal to support such a system has been written and financial assistance is being sought.

Considerable emphasis is being placed on the use of the area frame and other known methods to assist local agencies in gathering technology use indicators, and identifying levels of life benchmarks. PIADIC is now being staffed to guide these activities, with assistance from IICA, and local hires.

CIDIA and PASA technicians will assist IDIAP, UNAP, DEC, IMA, Ministry of Planning & CEDILAN in their effort to form sector or special area information networks. Considerable effort has gone into making these into technical information center, (1) through providing world-wide connections, (2) promoting Ing. Agronoms to be assigned to assist users, and (3) an encouraging active outreach program based upon user profiles. This effort will continue, special financial assistance is, however, called for.

IMA has finished its information inquest and will receive assistance to "capture" the information and get it into the specialized information center/system. PIADIC effort will continue with other specific data bases such as climate, soils, and technology levels, using PASA, University contracts, IICA staff and third-country professionals.

LIST OF ACRONYMS

AID	-	Agencia para el Desarrollo International
BID/IDB	-	Banco Interamericano de Desarrollo
BIRF/IBRD	-	Banco Internacional de Reconstrucción y Fomento
CABEI	-	Central American Bank for Economic Integration
CAN	-	Consejo Agropecuario Nacional (Costa Rica)
CATIE	-	Centro Agronómico Tropical de Investigaciones y Enseñanza
CENTA	-	Centro Nacional de Tecnología Agrícola (El Salvador)
CIAT	-	Centro Internacional de Investigación Agrícola Tropical
CIDA	-	Canadian International Development Agency
CIDIA	-	Centro Interamericano de Documentación e Información Agrícola (IICA)
CIGRAS	-	Centro para Investigaciones en Granos y Semillas
CIMMYT	-	Centro Internacional de Mejoramiento de Maíz y Trigo
CIP	-	Centro Internacional para la Papa
DEA	-	Director de Extensión Agrícola (Costa Rica)
DGIEA	-	Dirección General de Investigación y Extensión Agrícola (El Salvador)
DGOA	-	Dirección General de Operaciones Agrícolas (Honduras)
DIA	-	Director de Investigación Agrícola (Costa Rica)
DIGESA	-	Dirección General de Servicios Agrícolas (Guatemala)
EAP	-	Escuela Agrícola Panamericana (Honduras)
ENA	-	Escuela Nacional de Agricultura
ETA	-	Escuela Técnica Agrícola (Costa Rica)
FAO	-	Organización de las Naciones Unidas para la Agricultura y Alimentación (Food and Agriculture Organization
FECOAGROH	-	Federación de Cooperativas Agrícolas Hondureñas
FEDAGRO	-	Federación de Cooperativas Agrícolas (Costa Rica)
FEDECOAG	-	Federación de Cooperativas Agrícolas Guatemaltecas
GDP	-	Gross Domestic Product
GOCR	-	Government of Costa Rica

IADS	-	International Agricultural Development Service
IAN	-	Instituto Agrario de Nicaragua
ICAITI	-	Instituto Centroamericano de Investigación de Tecnología Industrial
ICRISAT	-	International Crop Research Institute for the Semi-Arid Tropics
ICR	-	Instituto de Colonización Rural (El Salvador)
ICTA	-	Instituto de Ciencia y Tecnología Agrícola
IDIAP	-	Instituto de Investigación Agropecuaria de Panama
IICA	-	Instituto Interamericano de Ciencias Agrícolas
INA	-	Instituto Nacional Agrario (Honduras)
INCAP	-	Instituto de Nutrición de Centro America y Panama
INDECA	-	Instituto de Comercialización Agrícola (Guatemala)
INTA	-	Instituto Nacional de Transformación Agraria (Guatemala)
INTA	-	Instituto Nacional de Tecnología Agropecuaria (Nicaragua)
INVIERNO	-	Instituto de Bienestar Campesino (Nicaragua)
IRRI	-	International Rice Research Institute
ISTA	-	Instituto Salvadoreño de Transformación Agrícola
ITA	-	Instituto Tecnológico Agrícola (Guatemala)
ITCO	-	Instituto de Tierras y Colonización (Costa Rica)
MAG	-	Ministerio de Agricultura y Ganadería
MIDA	-	Ministerio de Agricultura (Panama)
MRN	-	Ministerio de Recursos Naturales
OAS	-	Organización de Estados Americanos
OIRSA	-	Organismo Internacional Regional de Sanidad Agropecuaria
OPSA	-	Oficina de Planificación Sectorial Agropecuaria (Costa Rica
PIADIC	-	Programa de Información Agropecuaria del Istmo Centroamericano
PCCMCA	-	Programa Cooperativo Centroamericano para el Mejoramiento de Cultivos Alimenticios

PNIA	-	Programa Nacional de Investigación Agropecuaria (Honduras)
ROCAP	-	Regional Office for Central American Programs, U.S. Agency for International Development
SIATSA	-	Servicio Investigación Agrícola Tropical Sociedad Anónima (Honduras
SIECA	-	Secretaría Permanente del Tratado General de Integración Económica Centroamericana
STAN	-	Servicios Técnicos Agrícolas de Nicaragua
STICA	-	Servicio Técnico Interamericano de Cooperación Agrícola
UCR	-	Universidad de Costa Rica
UNDP	-	United Nations Development Program (PNUD)
USAID	-	United States Agency for International Development
USDA	-	United States Department of Agriculture
VITA	-	Volunteers for International Technical Assistance

DEFINITIONS OF TERMS

1. Cropping pattern. The crop and/or combination of crops on a field for one year.

2. Field. A single, uniform piece of land which has a single crop pattern. It is a single management unit and the smallest unit for which economic data can be collected on farmer management.

3. Cropping pattern potential. The potential, as determined by the physical environment for growing a cropping pattern, measured by crop yield. It includes crop growth as well as evaluation of the ability to manage (plant, harvest) the pattern using reasonable technology.

4. Cropping system. A single crop pattern together with its component technology alternatives (variety, fertilizer options, weed or insect management options, etc.). Allowance is made in the cropping system for variability in management of component parts.

5. Cropping system environment. The total of the physical, biotic and socio-economic factors which influence a cropping system.

6. Cropping system target area. A geographical area across which one or more cropping patterns, including their management options, can be grown at yield levels which are economical for that area.

7. Determinant variables. Those environmental factors having gradients over time or space which influence specific portions of the cropping system.

8. Farming systems research site. An operational center, usually a village around which research plots or experiments are clustered in a target area. Several sites may be located in a target area, with the target area itself named after one of them.

9. Primary target area. One in which initial pattern potential research is conducted. It is a cropping system target area limited by administrative boundaries, accessibility or other considerations relevant to agricultural development research and extension.

10. Secondary target area. One for which the pattern potential and environment-technology interactions have been researched elsewhere and applied to the secondary area by extrapolation.

11. Extrapolation of technology. The process of predicting, from given production performance in a defined physical environment, the production performance of a crop or animal system in a similar physical environment located in a different geographical area. Further development of this capability leads to description of technology-environment interactions and permits the extrapolation of production potential from a given area to one of different environment.

12. Production complex. A primary target area together with secondary target areas which have similar cropping pattern potential belonging to the same production complex.

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INCOMING
DEPARTMENT OF STATE

TELEGRAM

AMERICAN EMBASSY GUATEMALA

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ACTION TAKEN:
DATE:
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VV ESA683MGA693
RR RUESGT
DE RUESMG #0062 0042045
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R 042036Z JAN 79
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TO AMEMBASSY GUATEMALA 3159
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UNCLAS MANAGUA 0062

4 JAN 79 21. 06z

ACTION: HECHTMAN
INFO: ACKERMAN
VENEZIA

AIDAC

E.O. 12065: N/A
SUBJECT: AG RESEARCH AND INFO PP

REF: ACKERMAN-SIDMAN LETTER OF 12/27/78

FOR ROCAP

1. USAID/N ENDORSES ROCAP AG RESEARCH AND INFO PROGRAM PP. IT SUPPORTS GON ACTIVITIES AND USAID PROGRAMS.

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AMERICAN EMBASSY GUATEMALA

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P 091435Z JAN 79
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TO AMEMBASSY GUATEMALA PRIORITY 5089
BT
UNCLAS SAN JOSE 0110

ACTION: HECHTMAN
INFO: VENEZIA
FIESTER

AIDAC

GUATEMALA FOR ROCAP

EO 12065: N/A
SUBJ: ROCAP PROJECT PAPER-REGIONAL CENTRAL AMERICAN AGRICULTURAL RESEARCH AND INFORMATION PROGRAM

REF: ACKERMAN TO KNAEBEL LETTER OF 12/27/78

1. MISSION HAS RECEIVED AND REVIEWED ROCAP PP AND SUPPORTS ITS APPROVAL.

2. TECHNICAL ASSISTANCE AVAILABLE UNDER AGRICULTURAL INFORMATION PORTION OF PP IS HIGHLY SUPPORTIVE OF PROPOSED MISSION ACTIVITIES IN AREA FRAME CONSTRUCTION, DOCUMENTATION CENTERS AND DATA MANAGEMENT. PIADIC PERSONNEL HAVE CONTRIBUTED TO DEVELOPMENT OF MISSION PROJECT AND ARE NECESSARY FOR ITS EXECUTION.

3. CATIE PROJECT AS WELL AS PIADIC IS SUPPORTIVE OF OUR COMMODITY SYSTEMS PROJECT (515-T-027), AND WE EXPECT THE INVOLVEMENT OF BOTH CATIE AND PIADIC IN EXECUTION OF OUR UPCOMING FY'79 AND 80 PROJECTS IN NATURAL RESOURCE CONSERVATION AND AGRARIAN RESTRUCTURING. PIADIC MARKETS NEWS AND FORECASTING COULD HAVE MADE MEANINGFUL CONTRIBUTIONS TO SUCCESS OF COMMODITY SYSTEMS PROJECT (027). WE PLAN WORK CLOSELY WITH CATIE TO DEVELOP STRATEGY FOR INCREASING PLANNED CATIE PARTICIPATION IN THIS (027) AND OTHER PROJECTS. ALSO PLAN TO WORK WITH ROCAP TO OBTAIN INCREASED PARTICIPATION OTHER REGIONAL ORGANIZATIONS IN 027 AND UPCOMING PROJECTS.

WEISSMAN

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JAN 9 10 53 AM '79

PAGE 01 TEGUCI 00151 101725Z 7819
ACTION AID-31

INFO OCT-01 ARA-15 /047 W

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P 101706Z JAN 79
FM AMEMBASSY TEGUCIGALPA
TO AMEMBASSY GUATEMALA PRIORITY
INFO SECSTATE WASHDC PRIORITY 2787

UNCLAS TEGUCIGALPA 0151

AIDAC

GUATEMALA FOR ROCAP

EO 12065 N/A
SUBJECT: REVIEW OF ROCAP PP PROPOSAL - PROJECTS NOS. 596-5048 & 596-0083

USAID/HONDURAS HAS COMPLETED REVIEW OF ROCAP PP PROPOSING ASSISTANCE TO REGIONAL AGRICULTURAL RESEARCH AND INFORMATION PROJECTS. THE PAPER ACCURATELY REFLECTS THE DISCUSSIONS AND CONCLUSIONS BETWEEN OUR RESPECTIVE MISSIONS, AND, TO THE BEST OF OUR KNOWLEDGE BETWEEN THE RELEVANT HONDURAN GOVERNMENT MINISTRIES AND THE RELATED REGIONAL AGENCIES. AS WE HAVE PREVIOUSLY DISCUSSED, SUCCESS OF THIS PROJECT WILL REQUIRE CONTINUED CLOSE COORDINATION BETWEEN OUR RESPECTIVE MISSIONS DURING THE IMPLEMENTATION PHASE TO ASSURE POTENTIAL BENEFITS AVAILABLE FROM REGIONAL ECONOMIES OF SCALE ARE TRANSLATED TO THE NATIONAL TARGET GROUPS. ROCAP AND THE MWGISSION HAVE CLEAR UNDERSTANDINGS IN THIS RESPECT. MISSION ENDORSES THE PP AND RECOMMENDS AID/W APPROVAL.
JARAMILLO

UNCLASSIFIED

Department of State

INCOMING TELEGRAM

PAGE 01 PANAMA 00381 1621597

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ACTION AID-31

ANNEX XVIII C.
Page 4 of 7

INFO OCT-01 SSO-00 /032 W

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O 162036Z JAN 79
FM AMEMBASSY PANAMA
TO SECSTATE WASHDC IMMEDIATE 0647
INFO AMEMBASSY GUATEMALA

UNCLAS PANAMA 00381

AIDAC

GUATEMALA FOR ROCAP

E.O. 12065: N/A
SUBJECT: ROCAP: REGIONAL C.A. AGRICULTURAL RESEARCH AND INFORMATION SYSTEM PROJECT PAPER

REF: ACKERMAN/CULBERTSON LETTER 12/27/78

1. DURING INTENSIVE REVIEW PHASE USAID/P AND GOP NATIONAL AGENCIES WERE VISITED TWICE BY ROCAP TEAMS. THE FIRST HEADED BY H. ACKERMAN AND THE SECOND BY R. VENECIA. ON BOTH OCCASIONS USAID/P AND GOP ISSUES WERE DISCUSSED AND INCORPORATED INTO PP.

2. PROJECTS PROPOSED IN PP ARE SUPPORTIVE OF USAID/P ACTIVITY IN INTEGRATED RURAL DEVELOPMENT AND APPLIED AGRICULTURAL RESEARCH PROPOSED IN DEVELOPMENT STAGE.

3. USAID/P HAS REVIEWED PROJECT PAPER AND IS IN COMPLETE AGREEMENT WITH PROPOSAL. MOSS

UNCLASSIFIED

P 111538Z JAN 79
FM AMEMBASSY GUATEMALA
TO SECSTATE WASHDC PRIORITY 3032

UNCLAS GUATEMALA 0198

AIDAC

ROCAP

FOR LAC/CEN FARLEY AND VENEZIA

FOLLOWING SENT ACTION GUATEMALA JAN. 10 BEING REPEATED.

LA
C-1

QUOTE
UNCLAS SAN SALVADOR 0176

AIDAC

ROCAP

EO 12065: N/A
SUBJECT: ROCAP PP ON PROJECTS 0048 (PIADIC) AND 0083 (SFPS).

REF: (A) ACKERMAN/RUIZ LETTER OF 12/27/78, (B) MOFFETT/VENEZIA TELCON 1/4/79, (C) 78 SAN SALVADOR 5462

1. RECEIPT OF THIS LENGTHY DOCUMENTATION COINCIDED WITH LOCAL HOLIDAYS AND THE LIMITED TIME AVAILABLE FOR RESPONSE HAS PRECLUDED A REVIEW AND DISCUSSION WITH MAG, CENTA AND OTHER RELATED GOES PERSONNEL. WE DO NOT DOUBT THEIR SUPPORT FOR THE PIADIC EXTENSION BUT ARE UNEASY ABOUT FULL CONCURRENCE WITH THE CATIE PROPOSAL. WE WOULD TRUST HOWEVER THAT A SATISFACTORY ACCORD ON DETAILS OF A COLLABORATIVE CATIE/CENTA ENDEAVOR COULD BE DEVELOPED WITHOUT SERIOUS DIFFICULTIES.

2. WHILE WE FULLY SUPPORT THE PROPOSED EXTENSION OF THE PIADIC PROJECT WE ARE CONCERNED ABOUT THE STRONG INFERENCE THAT THE CATIE PROJECT ACTIVITIES WILL BE THE MAJOR RESEARCH ACTIVITIES UNDERTAKEN BY THE RESPECTIVE COUNTRIES IN THE REGION TO RESOLVE THE TECHNOLOGICAL PROBLEMS IN THE THREE TYPES OF BASIC SMALL FARMER PRODUCTION SYSTEMS. IN SOME COUNTRIES THIS MAY BE TRUE. EVEN AS AMBITIOUS AS THE PROJECT PROPOSAL IS, WE COULD NOT ENVISION THIS AS BEING THE CASE IN EL SALVADOR. WE DO CONCUR WITH THE BASIC THRUST OF THE PROJECT, HOWEVER, AND DO FEEL THAT CATIE COULD AND SHOULD BE SUPPORTED TO PROVIDE REGIONAL GUIDANCE IN THIS CRITICAL AREA OF RESEARCH AND THAT THROUGH AN ACTIVE OPERATIONAL AND TRAINING PROGRAM HELP REFINE A REGIONAL METHODOLOGY AND SUPPORT THE DEVELOPMENT OF RELATED IN-COUNTRY CAPABILITIES.

3. RE SECTION C. (PAGE 12) RELATIVE TO CA USAID PLANNING FOR RESEARCH PROJECTS. ALTHOUGH IT DOES NOT APPEAR IN YOUR PP, IT SHOULD BE NOTED USAID/ES PROPOSED A PROJECT FOR FY 80 IN ITS RELATED ABS WHICH WOULD HAVE A RESEARCH COMPONENT (SMALL FARM TECHNOLOGY, PROJECT 519-02). THE MAJOR FOCUS OF THIS PROJECT, HOWEVER, WOULD BE ON EXTENSION. CURRENT FUNDING PROJECTIONS NOW SUGGEST A POSSIBLE DEFERRAL. IN NEXT TO LAST PARAGRPAH ON THIS SAME SECTION WE WOULD ALSO WELCOME INCLUSION AMONG COUNTRIES WHERE PROJECT RESEARCH WOULD ENCOMPASS THE TECHNOLOGY TRANSFER PROCESS.
DEVINE UNQUOTE
ACKERMAN. BOSTER

AGENCY FOR INTERNATIONAL DEVELOPMENT
UNITED STATES A. I. D. MISSION TO GUATEMALA
AMERICAN EMBASSY
GUATEMALA CITY, GUATEMALA, C. A.

January 9, 1979

Mr. Harry Ackerman
Director
ROCAP
Guatemala City, Guatemala

Dear Harry:

We have gone over the Regional Central American Agricultural Research and Information Program PP with considerable interest in view of our own related bilateral activity in the area of agricultural research. Our Office of Rural Development and Program Office staffs were especially forthcoming with comments. We would like to offer you the following distillation of our impressions:

We see the proposed activity as complementary to our effort in agricultural research, i.e., our support for the Guatemalan agricultural research institution, ICTA. Cropping systems research at the regional level is expected to become increasingly useful to ICTA as that institution moves from its present emphasis on biological research using the single cropping methodology toward research involving interplanting of two or more crops. Your project will also affect, to a degree not yet determined, the scope and focus of the USAID proposed Small Farmer Diversification Systems project.

The existence of an on-going program in Guatemala into which the proposed activity can tie augurs well for the project's impact in this country. We see the existence of such programs with substantial country or other donor contributions as vital if the project is to impact significantly in the individual countries.

Similarly, information flow between countries is heavily dependent upon capacities of country-level institutions to utilize information as well as upon

their capabilities of contributing information to the system. In view of these factors extraneous to the project, we think that project outputs in this area may be overly optimistic.

On the balance, we view the proposed activity as potentially beneficial to Guatemala. We would hope that emphasis on the development of technology with wide replicability throughout the region will not work toward the exclusion of the Guatemalan Highlands, which are unique in microclimatic and other factors, and would therefore require rather specific technology.

Sincerely,

Frederick W. Schieck
Director