PD-AAP-571

AGENCY FOR INTERNATIONAL DEVELOPMENT

PROJECT DATA SHEET

1. TRANSACTION CODE: A (A = Add, C = Change, D = Delete) — Amendment Number

DOCUMENT CODE: 3

2. COUNTRY/ENTITY: HONDURAS

3. PROJECT NUMBER: 522-0249

4. BUREAU/OFFICE: LAC — 05

5. PROJECT TITLE (maximum 40 characters): Agricultural Research Foundation

6. PROJECT ASSISTANCE COMPLETION DATE (PACD): MM 08 DD 30 YY 94

7. ESTIMATED DATE OF OBLIGATION (Under 'B.' below, enter 1, 2, 3, or 4)

A. Initial FY 84 B. Quarter 4 C. Final FY 93

8. COSTS ($000 OR EQUIVALENT $1 =)

A. FUNDING SOURCE	FIRST FY 84 B. FX	C. L/C	D. Total	LIFE OF PROJECT E. FX	F. L/C	G. Total
AID Appropriated Total						
(Grant)	(150)	(80)	(230)	(13,000)	(7,000)	(20,000
(Loan)	( )	( )	( )	( )	( )	(
Other U.S. 1.						
Other U.S. 2.						
Host Country	–	500	500	–	6,000	6,000
Other Donor(s)				1,500	5,500	7,000
TOTALS	150	580	730	14,500	18,500	33,000

9. SCHEDULE OF AID FUNDING ($000)

A. APPROPRIATION	B. PRIMARY PURPOSE CODE	C. PRIMARY TECH. CODE 1. Grant	2. Loan	D. OBLIGATIONS TO DATE 1. Grant	2. Loan	E. AMOUNT APPROVED THIS ACTION 1. Grant	2. Loan	F. LIFE OF PROJECT 1. Grant	2. Loan
(1) ARDN	121	968				230		20,000	
(2)									
(3)									
(4)									
TOTALS									

10. SECONDARY TECHNICAL CODES (maximum 6 codes of 3 positions each): 80, 70

11. SECONDARY PURPOSE COD

12. SPECIAL CONCERNS CODES (maximum 7 codes of 4 positions each)

A. Code	R/AC	BF					
B. Amount	20,000	(20,000)					

13. PROJECT PURPOSE (maximum 480 characters)

To establish the Honduran Agricultural Research Foundation (FHIA), which will expand and improve the agricultural research system in Honduras and enable it to be more responsive to the technological needs of farmers, particularly those producing non-traditional crops for export.

14. SCHEDULED EVALUATIONS

Interim MM 06 YY 86 MM 06 YY 88 Final MM 05 YY 93

15. SOURCE/ORIGIN OF GOODS AND SERVICES: [X] 000 [ ] 941 [X] Local [ ] Other (Specify)

16. AMENDMENTS/NATURE OF CHANGE PROPOSED (This is page 1 of a ____ page PP Amendment.)

17. APPROVED BY

Signature: Anthony J. Cauterucci

Title: Anthony J. Cauterucci, Mission Director

Date Signed: MM 08 DD 06 YY 84

18. DATE DOCUMENT RECEIVED IN AID/W, OR FOR AID/W DOCUMENTS, DATE OF DISTRIBUTION: MM DD YY

AID 1330-4 (8-79)

i

TABLE OF CONTENTS

		PAGE
Face Sheet		
Project Authorization		
Table of Contents		
I.	PROJECT SUMMARY AND RECOMMENDATIONS	1
	A. Recommendations	1
	B. Grantee	1
	C. Project Summary	
	D. Relationship to A.I.D. Strategy and Programs	4
	E. Summary Financial Plan	5
	F. Summary Findings	5
	G. USAID/Honduras Project Development Committee	5
II.	BACKGROUND AND JUSTIFICATION	6
	A. Country Setting	6
	B. Project Setting	6
	1. The Agricultural Sector	6
	2. GOH Policy Orientation	8
	3. Agricultural Research in Honduras	9
	C. Problem Statement	12
	D. Constraints to Effective Agricultural Research	13
	E. Project Rationale	14
III.	PROJECT DESCRIPTION	16
	A. Goal and Purpose	16
	B. End-of-Project Status	17
	C. Project Beneficiaries	18
	D. Project Strategy	18
	E. Description of Project Activities	19
	1. Foundation Organization	19
	2. Research Program	22
	3. Communications, Outreach and Institutional Development	33
	4. Technical Analytical Services	38
	F. AID Monitoring	40
	G. Relationship of FHIA to the Honduran Agricultural Research System	41

PAGE

IV. PROGRAM FACTORS 42

A. Relationship to A.I.D. Programs 42
1. Relationship to A.I.D. and Mission Strategy 42
2. Relationship to USAID Projects 42
3. The A.I.D. Science and Technology Bureau Office of Agriculture (S&T/AGR) 43
B. Relationship to Other Donor Programs 45

V. PROJECT ANALYSES 47

A. Technical Analysis Summary 47
1. Research 47
2. Dissemination Channels for Research 51
B. Administrative Feasibility 55
1. Responsiveness of Organizational Structure 55
2. Ability to Keep Skilled Staff 56
3. Level of Operations 57
4. Financial Viability 57
C. Financial Analysis Summary 58
1. Project Funding 58
2. Financial Analysis of the Foundation 61
D. Economic Analysis Summary 64
E. Social Analysis Summary 68
1. Introduction 68
2. Target Groups 68
3. The Transfer of Technology: Notes on the Honduran Experience 72
4. Implications of the Target Group Characteristics for the Foundation 75
F. Environmental Concerns 76

VI. PROJECT IMPLEMENTATION 76

A. Host Country Arrangements (Foundation) 76
1. Selection and Hiring Director General for Foundation 77
2. Naming of Final Board of Directors 77
3. International Agreement 77
4. Interinstitutional Project Implementation Agreement 77
B. A.I.D. Arrangements 78
1. Disbursement Procedures 78
2. Procurement Procedures 78
3. Project Monitoring 79
C. Implementation Plan 79
D. Evaluation Plan 79

PAGE

VII. CONDITIONS, COVENANTS AND NEGOTIATION STATUS 81

A. Conditions and Covenants 81
B. Negotiation Status 81

ATTACHMENTS TO THE PROJECT PAPER

I. PROJECT EXHIBITS

A. Logical Framework
B. PID Guidance Cable
C. Summary Response to PID Guidance Concerns
D. Initial Environmental Evaluation
E. Implementation Plan and Schedule

II. LEGAL EXHIBITS

A. 611(e) Certification
B. Grant Application
C. Draft Authorization
D. Statutory Checklist
E. P.D. 71 Waiver

III. TECHNICAL EXHIBITS

A. Technical Analysis for Research
B. Technical Analysis for Dissemination Channels
C. Administrative Analysis
D. Economic Analysis
E. Institutional Development and Demand for Services
F. Social Soundness Analysis
G. Financial Analysis Tables
H. Foundation Legal Documents
   1. FHIA
   2. Friends of Central American Research Foundation
I. Relationship Between FHIA and Export Development and Services Project (522-0207)
J. Expression of Interest
K. Description of Facilities and Equipment and Summary of Value Assessment

I. PROJECT SUMMARY AND RECOMMENDATIONS

A. Recommendations

USAID/Honduras recommends authorization of a $20,000,000 Development Grant for a Honduran Agricultural Research Foundation Project. Given the long-term commitment required for effective agricultural research, it is recommended that the Project be incrementally funded over a ten-year period.

B. Grantee

The Grantee will be the Honduran Agricultural Research Foundation (FHIA).

C. Project Summary

1. Problem and Rationale. An important impediment to expanded agricultural output and increased rural sector income in Honduras is the low level of agricultural productivity. This constraint affects not only production of Honduras' food staples, but the production of traditional export crops and efforts to diversify its export base as well. As the country begins to take advantage of the Carribbean Basin Initiative (CBI) and other incentives, it is clear that developing Honduran competitiveness will depend not only on penetrating new markets but also on finding the most efficient production systems and resolving production constraints such as pests, diseases, product quality, and related problems. Although the GOH realizes the importance of diversifying its export base, its main objective is improving basic foods production and research. Given the magnitude of problems faced by government programs, the GOH is hardly in a position to provide the technological base that is needed for an expanded agricultural diversification program. Despite considerable assistance from other donors, including AID, GOH research efforts are afflicted by many of the constraints which affect public sector research efforts worldwide. Research activities are hampered by tight budgetary restrictions, high personnel turnover, weak linkages between research and extension, and lack of qualified personnel.

In light of this experience, a general consensus has been created among Honduran, AID, and other experts who have concluded that, while an expanded research program in Honduras is a necessity, the current system precludes the possibility of effectively carrying out this objective. With this premise, USAID/Honduras and GOH thinking turned to the creation of alternative models to undertake the needed effort. The United Brands Company, for a variety of reasons, decided to close down its world-recognized research facility located in La Lima, Honduras, and offered to donate those facilities to a private organization.

After intensive review of different options, we have concluded that the establishment of an independent private research foundation, to be located in La Lima and headquartered at the donated facilities, is the most effective way

to overcome the aforementioned administrative and political deficiencies of previous research programs, to involve the private sector in supporting its own technological needs, and to support the public sector research agenda. Free of political machinations and supported with appropriate funding, the Foundation will be in a position to attract and keep the best human resources available in Honduras and abroad, and provide the long-term research outlook which has been missing in Honduras and elsewhere.

2. Project Description. The goal to which this Project contributes is to increase incomes for farmers and generate additional employment in Honduras. The purpose of the Project is to establish the Honduran Agricultural Research Foundation (FHIA), which will expand and improve the agricultural research system in Honduras and enable it to be more responsive to the technological needs of farmers, particularly those producing non-traditional crops for export. The Foundation will be governed by a number of guiding principles that are illustrative of its operational strategy. These include:

- The Foundation will remain politically and administratively independent. Its research priorities will be determined by its clients, and by its Director General and Board of Directors.

- Honduran development needs and the needs of its producers will be FHIA's primary concern. Nonetheless, research findings will be available to all Central American nations and regional and international research centers. In particular, the banana breeding program, although administered by FHIA, will be managed and financed separately and will be completely open for the benefit of other producers.

- Agricultural technologies must be developed within the context and setting that analyzes all constraints faced by its users. In recent years, there has been a tendency to oversimplify the dichotomy between "basic" and "adaptive" research. In fact, they are both necessary for the development and effective dissemination of appropriate technologies. The extent that one is emphasized depends on the specific crop involved and the problems being addressed. Nonetheless, a guiding principle of the Foundation will be that any specific research program is complete only when the product is tested in the field under "real life" conditions. This will require a multidisciplinary team approach involving plant scientists, agronomists, economists, soil scientists, pathologists and others in the research program.

- Increased attention must be given to international and national research networks in order to not duplicate research efforts and to maximize research impact. One of the most important constraints affecting agricultural research worldwide is weak linkages between the International Agricultural Reserch Centers and national programs. FHIA will develop strong linkages with the IARCs, particularly those involved in basic foods. In those cases, the Foundation will act as a conduit of information between the centers and the GOH. Collaboration with local institutions is equally important. Numerous national agencies have active dissemination programs, including the

MNR, INA, other official agencies, private volunteer organizations, federations, associations, cooperatives, input supply concerns and others. The Foundation will work with these agencies in disseminating research information through in-service training demonstrations, on-farm trials, printed materials, etc. Similar linkages will be established with U.S. universities, USDA and other institutions involved in non-traditional export crops. The Foundation will hold frequent short courses for farmers, extension agents and others, and otherwise collaborate in the information dissemination process.

- Agricultural research, extension and training are interdependent and need to be closely coordinated. Any research program should take into account the interrelationships of these three vital services and must be organized accordingly. FHIA will be organized to do research, train its personnel through in-service and other training, and collaborate with extension organizations responsible for dissemination of research results.

The Project consists of four interrelated components addressing constraints related to the development and dissemination of appropriate agricultural technologies, the provision of needed analytical and technical services, and the long-term financial viability of a research institution.

a. Establishment of FHIA. Project funds will contribute to the permanent establishment of FHIA, including initial capital investments (land, agricultural, laboratory, data processing and communications equipment), technical assistance, and core administrative staff support.

b. Research Programs. FHIA will undertake research programs aimed at improving the productivity of non-traditional export crops, traditional export crops, and basic food crops.

(1) Non-traditional crops. The expanded production of non-traditional export crops will be FHIA's principal priority. In line with the commodity systems that will be developed under the Export Development and Services Project, initial emphasis will be given to research in citrus, winter vegetables, and cocoa.

(2) Traditional export crops. Given the importance of banana and plantain production to the economies of Honduras and other area countries, and given the importance of the banana and plantain breeding program that has been carried out by United Brands Company, FHIA will concentrate its initial traditional export crop efforts on managing the continuation of this world-renowned program. However, since producing countries and multinationals will benefit from the program, Project funds will not directly be used to support the program. Research on coffee and other traditional export crops will be undertaken after FHIA is firmly established.

(3) Basic food crops. While the Ministry of Natural Resources will maintain primary responsibility for basic food crops research, FHIA will establish links with the International Agricultural Research Centers (IARCs) to assist in the adaptation of technologies developed by them.

c. Communications, Outreach, and Institutional Development Programs. FHIA will establish a small but effective Communications and Development Directorate which will establish links to: (a) national and international agricultural research centers and educational institutions; (b) producer, processing, trade, and other private sector organizations; (c) the National Extension Service; and (d) potential sources of research grants, contracts, endowments and other sources of funding. Modern communications technology will be used to produce materials in various media, improve the quality of training provided for extensionists, and maintain research data and information.

d. Multidisciplinary Research and Technical Services Program. FHIA will continue and expand the important services provided for many years by United Brands Company laboratory testing services, including diagnostic, analytical, and testing services for public and private sector groups. These income-generating services can provide one of the quickest and most economic increases in crop yields.

D. Relationship to AID Strategy and Programs

Given their importance to Honduras and its people, agriculture and rural development have been and will continue to be AID's most important priorities in Honduras. USAID/H efforts in the sector aim to promote equity, promote private sector-led growth, apply these to the overall strategy of export diversification, and assist Honduras in maintaining a reasonable level of food security and improved nutrition. The establishment of FHIA through the Project plays a key role in the Mission's long-term development strategy by providing the technological base for increased and sustained production of non-traditional and traditional export crops and basic food crops, and by enhancing existing mechanisms to disseminate available production technologies which will improve productivity, incomes, and nutrition in the rural sector.

The Project coincides with AID's priority areas of promoting the involvement of the private sector in development, supporting the transfer of technology, and strengthening indigenous institutions. Ongoing discussions between the GOH, FHIA and AID will also provide a useful mechanism to engage the GOH in policy dialogue on policy obstacles to the effective utilization of research findings. The Project is in line with the Agency's overall research priorities. The Project also complements, and is complemented by, a number of new and ongoing USAID Projects, particularly the Export Development and Services Project (522-0207).

E. Summary Financial Plan
(US $000)

Component/Activity	AID	GOH	PRIVATE SECTOR/OTHER DONORS	TOTAL
I. Administrative/Operating Costs				9,190
A. Salaries/other operating exp.	6,185	1,175	1,180	8,540
B. Technical assistance	650	-	-	650
II. Capital Investments	1,060	1,385	675	3,120
III. Experimental Substations	220	150	-	370
IV. Research Programs				12,975
A. Non-traditional export crops	3,470	-	4,420	7,890
B. Traditional export crops	-	775	250	1,025
C. Basic food crops	1,200	1,455	475	3,130
D. Other research operations	770	160	-	930
V. Communications and Development	2,790	900	-	3,690
VI. Technical Analyticial Services	2,700	-	-	2,700
VII. Evaluation	200	-	-	200
VIII. Project Liaison Officer	375	-	-	375
IX. Contingency	380	-	-	380
TOTAL	20,000	6,000	7,000	33,000

F. Summary Findings

The Project Development Committee has reviewed all aspects of the proposed Honduran Agricultural Research Foundation Project and concluded that the Project is institutionally, financially, economically, technically, socially, and environmentally sound, and consistent with the development objectives of the GOH and with USAID strategy and objectives.

G. USAID/Honduras Project Development Committee

Gordon Straub	Agricultural Officer
Danilo Cruz-DePaula	Capital Development Officer
Steven Wingert	Agricultural Officer
Mario Contreras	Research and Extension Advisor
Orlando Hernandez	Social Analysis & Evaluation Officer
Reyes Herrera	Financial Analyst
Edgardo Fu	Financial Analyst
William Goodwin	Agricultural Economist
James Walker	S&T/Agriculture

Winrock International

U.J. Grant (Chief of Party)
Martin Gonzalez
Ted Williams
Alex Beeler
Catherine Balsis
Russell Dorrasier
George Norton

Academy for Educational Development

Howard Ray

II. BACKGROUND AND JUSTIFICATION

A. Country Setting

Honduras is one of three functioning democracies and the poorest country in Central America. Of its 4.1 million people, 2.6 million live in rural areas. Per capita income in 1981 was estimated at $675. The economy's real GDP growth rate dropped from an average of 7% during the late 1970's to a negative rate of over 1% in each of the past three years. Average real per capita income has declined by almost 14% from 1981. In 1978, the average annual per capita income was $155 in the countryside and $496 in the urban areas. In the same year, the estimated annual poverty line based on income per person was $230. Some 77% of rural residents and 34% of urban residents had per capita earnings below that level.

Honduras' poverty is evidenced by most of the characteristics normally associated with underdevelopment. The literacy rate is 60%, life expectancy is 57 years, infant mortality is 87 per thousand, the population is growing at 3.4% yearly, and the average age is 16 years. Approximately 70% of the population suffers from some degree of malnutrition. The human resource base is weak and infrastructure and public services are inadequate. Unemployment is estimated at 25%, and underemployment at an additional 30-35%.

The country's long-term social and economic development is impeded by a rugged and mountainous terrain often unsuited for cultivation, use of a high percentage of the most fertile and tillable land for cattle raising, a fragile and deteriorating natural resource base, an economy largely based on tropical export agriculture subject to wide fluctuations in world market prices, the second highest population growth rate in the Western Hemisphere, a weak and unagressive private sector, and government institutions with limited ability to formulate and execute effective policies and programs.

B. Project Setting

1. The Agricultural Sector. The agricultural sector plays a crucial role in the national economy of Honduras. Agriculture production provides more than 90% of all foodstuffs consumed in the country. It contributes roughly 30% of the GDP and nearly 70% of all export earnings. It provides employment, however meager, to over 60% of the economically active population.

Honduras has a wide range of climatic conditions which permit production of most warm and cool climate crops. It produces most staple food crops, except for wheat, which is produced only in very small quantities. Virtually all types of fruits and vegetables can be grown. Major export crops have traditionally included bananas, coffee, sugar, tobacco, cotton, beef and lumber. Livestock and forestry production are also important in Honduras.

Some 750,000 hectares of land are dedicated to annual and perennial crops and another one million hectares are used for grazing. Available information suggests that only about 20% of the land suitable for crop production is used for that purpose. Much of the unused agricultural land is located in the largely unsettled areas of the East and Northeast. About one half the land in crops is in basic grains, while the remainder is used for the major export crops, fruits, vegetables and palm oil.

a. Export Crops. Agricultural production for export accounts for two thirds of the country's foreign exchange earnings. About 80% of this total is derived from traditional crops and other traditional export products.* The remaining 20% is in non-traditional crops, which include citrus, pineapple, annual fruits, vegetables (melons, cucumbers, onions, peppers, etc.), cassava, and African palm oil.

The inherent limitation of such a narrow export base is amply illustrated by current conditions. General deterioration in the world economy has caused low prices and stagnant demand for wood products and meat. The price of bananas has declined and world coffee and sugar supplies are overabundant. The weak demand and prices for these crops have resulted in reduced foreign exchange earnings, lower farm incomes and increased unemployment.

New diseases and insects are also causing major production problems. Coffee rust has forced many small farmers to abandon production without a viable crop substitute. Black sigatoka continues to cause losses for plantain and banana growers, including not only commercial growers but also the backyard grower throughout the areas below 1000 feet elevation, where bananas and plantain are so ubiquitously grown that they are widely called "poor man's bread." Blue mold on tobacco and the Mediterranean fruit fly on citrus are emerging as major production problems. Other commercial crops, such as cocoa, melons and citrus, have had consistently low per hectare yields.

---

* Traditional exports are defined as those products accounting for more than 20% of total exports in 1982 and/or those products listed as traditional exports under the GOH's 1983 Export Incentive Law. These groupings are consistent except for some minor products and generally include bananas, coffee, metal ores, beef, shrimp and lobster, and sugar.

b. Basic Food Crops. The basic food crops in Honduras are corn, beans, sorghum and rice. The first three are grown primarily by small farmers, while rice is produced on larger, commercial farms. Corn is grown by more farmers and uses more land (about 400,000 hectares) than any other cultivated crop. Production has declined in recent years and Honduras has been forced to import corn, recently in relatively large quantities. Beans (primarily red) are the second most important food in the diet. Although Honduras was a net exporter for many years, production (on about 75,000 hectares) now is rarely sufficient to meet domestic needs. Sorghum is used for both human and animal consumption and is grown on about 70,000 hectares. Honduras no longer exports the small quantities of sorghum it did in the past. Rice is relatively less important as a foodstuff. Grown on about 21,000 hectares, production since 1978 has increased eonough to meet domestic demand and limited quantities are exported.

The severity of this situation is aggravated by the annual 3.4% population growth rate. The poorer half of the population consumes only 60%-70% of the minimum daily requirement of calories and protein. In part, this is due to deficiencies in the internal grain marketing and distribution network, but it also reflects the relatively low level of productivity.

2. GOH Policy Orientation. GOH agricultural policies are generally sound and have improved since 1982 under the Suazo administration. The U.S. Presidential Agricultural Task Force (PATF), which visited Honduras in the fall of 1982, made a series of policy recommendations aimed at increasing production, stimulating private sector investment, devising more appropriate organizational structures, and creating viable markets for agricultural commodities. The government has begun to implement many of these recommendations.

Nonetheless, policy improvements are required. The legal basis for defining riparian rights and providing incentives for the establishment of private irrigation systems needs to be developed. The opening of Central Bank discount facilities to responsible non-bank lenders, where such lenders accept a reasonable degree of regulation from the Central Bank, would help to achieve broader target group access to credit. In addition, rationalization of basic grains support pricing is needed (the GOH presently subsidizes production heavily but farmers do not necessarily benefit) in order to minimize the cost of the system to the state and improve market functioning. On the export promotion side, numerous disincentives exist which must be corrected, particularly foreign exchange restrictions.*

* The Export Development and Services Project (522-0207) contains a detailed discussion of these constraints and the Mission/GOH strategy for overcoming them.

These and other issues make up the Mission's policy agenda with the GOH. During the past two years, considerable progress has been made in establishing a sound policy framework. Our experience to date, as well as discussions and negotiations with the GOH on a new stream of Mission projects related to the objectives of expanding the export base and improving agricultural productivity indicate that continued progress is a reasonable assumption.

In particular, the GOH recognizes the country's dangerous dependency on a relatively small number of traditional export crops and is committed to diversifying its economic base. CBI legislation has encouraged private sector producers and entrepreneurs to develop new agricultural enterprises based both on a redirection of the traditional export crops and the production and processing of non-traditional crops for export.

3. Agricultural Research in Honduras

a. Public Sector. Research efforts in the public sector began in the early 1950's with the Interamerican Technical Service for Agricultural Cooperation (STICA), which was responsible for both research and extension. STICA was superseded by DESARRURAL (Cooperative Service for Rural Development) and later by the National Program for Agricultural Investigation (PNIA). These early research efforts emphasized increased production of basic foodgrains, and concentrated primarily on crop-oriented research conducted under controlled conditions.

In the early 1970's, the Interamerican Development Bank (IDB) assisted the Honduran Government to strengthen both its research and extension progams. This activity brought about substantial improvements in the facilities and equipment of the six PNIA experimental stations and the professional level of the research staff. The MNR began limited diversification efforts during the loan period, including some research work on oilseed crops, vegetable crops, and other cereal crops, including wheat.

The 1978 AID-financed Honduran Agricultural Sector Assessment, which identified problems in both research and extension services, was followed by an in-depth study on PNIA and its activities. The study, executed by the International Agricultural Development Service (IADS), concluded that: (1) the GOH program was restricted largely to station-based varietal testing and agronomic trials; (2) the basic network of research stations was in need of further improvement; (3) the system had a serious shortage of trained manpower; (4) linkages with other foreign and domestic research institutions were limited; and (5) PNIA lacked administrative control over the budget. It further concluded that the research system had had insufficient impact on farmers' yields and national production, and virtually no effect on small farmers' practices.

The IADS study became the basis for a $1.9 million AID grant (later expanded to $2.7 million), the Agricultural Research Project (522-0139). Authorized in 1978 and scheduled to end in December 1984, the purpose of the project is to expand the GOH agricultural research service and make it more responsive to

the needs of small farmers through a multidisciplinary, farming-system based research approach. Considerable progress has been made in institutionalizing an on-farm research methodology within the MNR system, and approximately 75% of GOH agricultural research is now conducted on-farm. Three AID-sponsored CRSP activities which have also supported GOH research in recent years, Sorghum/Millet, Bean/Cowpea, and Aquaculture, are discussed fully in Section IV.A.

The National Agrarian Institute (INA) also conducts a number of smaller research programs. Perhaps the most significant of these is the cocoa hybrid seed project at La Masica with current production of seedlings estimated at 300,000 per year. The program, however, has suffered from management difficulties as well as inadequate funding. INA has also carried out numerous pasture improvement projects in the past.

The Agricultural Research Department of the Honduran Coffee Institute (IHCAFE), a producer-supported institution, has an active program in progress. Research includes agronomic practices (planting density, pruning systems, etc.), optimal fertilizer use, plant improvement (testing of selections and varieties for quality, yield and disease resistence), plant pathology and entomology. These activities are conducted on five research stations throughout coffee producing areas. Since early 1982, approximately 104 experiments have been undertaken.

In addition to the above, the IHCAFE Diversification Department is carrying on studies of crops which might be used to diversify the farms of the coffee growers. Crops under study for this purpose are pimento (allspice), cardamom, macadamia, pineapple and highland oranges. IHCAFE also has a research program in cocoa and some attention is being paid to rubber and plantain. Nurseries have been established and plants are being distributed for the major diversification crops.

Despite the achievements of these and other efforts, the GOH research program has suffered from the management inefficiencies as further described in Section II.C. below.

b. Private Sector. Historically, private sector agricultural research efforts in Honduras have not been linked to the GOH program. Until recently, there has been little or no coordination between public and private initiatives. In addition, many of these private sector initiatives are in reality technical assistance efforts and do not involve continuous research.

i. United Brands. The most notable private research program has been the United Brands Tropical Research Center in La Lima, which has excelled for over 50 years in research applied to the production and exportation of agricultural commodities from several countries in the Caribbean Basin. Its origins can be traced back to pioneer work performed at the Botanical Garden at Lancetilla, Honduras in the 1920's. Even though its primary focus has been on banana production and post-harvest research, the Center was instrumental in introducing African oil palm to Central America in

the 1950's and in supporting a small number of non-traditional crops during the 1970's (soybeans, sunflowers, and vegetables). Additionally, for several years it conducted trials on the basic grains: corn, beans and sorghum. However, it terminated the latter program in 1980 due to the high cost of maintenance, relative to the benefits the Company could directly realize from it.

At its zenith, United Brands was investing nearly $5 million annually in the Center's research programs. However, the current financial crisis of the banana industry has forced United Brands to undertake several deep cost-cutting measures. Because it perceived itself as making heavy research investments on which its competitors quickly capitalized, the Company decided in 1983 to close down the Tropical Research Center and offered to donate the La Lima facilities to private interests.

The Company has also initiated numerous efforts to diversify its export base in Honduras. Land and Water Products Inc. (PATSA), a subsidiary of United Brands Co., began in the 1970's to produce winter vegetables and fruits with local producer organizations (two cooperatives) and the Ministry of Natural Resources. While not technically a research operation, the Company provides, through PATSA, seed and other inputs for production. Production assisted by PATSA has grown from 200 hectares in 1976/77 to over 1,200 hectares in 1983/84.

ii. Standard Fruit. The Standard Fruit Company in Honduras currently maintains a research program consisting of three test sites, all fairly close to their headquarters in La Ceiba, in Aguan, Isletas, and the Sula Valley. The company estimates that this program presently comprises 150 small research sub-projects, all of which are production-oriented and deal with improvements in yields. The breakdown of this research is approximately 60% in banana-oriented research, 35% in pineapple and 5% in citrus.

iii. Purdue University/Mejores Alimentos. This activity, supported by the Agricultural Research Project (522-0139), has demonstrated the potential of mobilizing private sector resources in conducting research for the benefit of small and medium farmers. Mejores Alimentos ("Best Foods"), a private sector processing firm, is providing land, labor and other significant inputs, including management, while technical assistance is provided by Purdue University. This two-year-old effort has identified small farmer tomato production constraints and is testing technological innovations that will significantly increase yields and reduce production costs. Mejores Alimentos contributions are not philanthropical, but are made with the expectation of increased raw material supplies for their plant.

iv. Other Private Sector Efforts. Several other private sector firms are carrying out much more limited independent research (Griffin and Brands, for example, has cooperated with eight Agrarian Reform Cooperatives disseminating technologies developed in other programs), and some Private Voluntary Organizations such as CARE are also undertaking small efforts.

c. Educational Institutions

Some agricultural research is currently conducted in Honduras by educational institutions. In general, this research responds to individual initiatives by professors and students as a part of the regular academic work load. Research is carried out mostly on campus, has weak relations with other programs and little formal recognition is given to those engaged in this activity.

The Pan American Agricultural School (EAP), at El Zamorano, has had some involvement in research over the years. This has varied in focus and intensity depending on internal management policies of the institution. It normally responds to individual interests of professors and students, and it is usually combined with regular agricultural production operations. At present, a small but well directed Integrated Pest Management Program (USAID OPG) is being executed by EAP. To date, one crop cycle of experimentation has been completed and a series of audiovisual materials has been developed for training. Work is carried out on-campus and in two other regions of the country, with some collaboration of MNR research personnel and farmers.

The National University Agricultural School (CURLA) at La Ceiba maintains a small research field on campus for varietal testing on food crops (maize, cassava, etc.), as well as cattle feeding studies. These research activities have little relation with other national or international programs and are conducted more in response to specific academic interest of students and faculty.

C. Problem Statement

An important impediment to expanded agricultural output and increased rural sector income in Honduras is the low level of agricultural productivity. The development and diffusion of technology - a key stimulus to agricultural progress - is weak. As Honduras begins to diversify its agricultural export base to take advantage of the CBI and other incentives, it is becoming clearer that developing Honduran competitiveness in these areas will depend not only on finding markets that Hondurans can compete in and stimulating production of crops with good marketing potential, but also on finding the most efficient production systems and resolving production constraints such as pests, diseases and related problems. Experience in Honduras and elsewhere has demonstrated time after time that without an adequate technological base, considerable efforts and investments can be destroyed overnight. A need for improved post-harvest, packaging and handling technologies is also clear. Although the GOH is now beginning to realize the importance of expanding its export base, its main policy objective is aimed at improving basic grains research, and, given the magnitude of problems that it faces, it is hardly in a position to provide the technological base that is needed for an expanded agricultural diversification program. The numerous research/dissemination programs currently being undertaken by the private sector are dispersed. No institution presently exists that is capable of effectively providing the sector's research needs.

The calibre of banana-related research in Honduras has been excellent, but the discontinuation of United Brands support for its banana breeding operations this year threatens Honduras and other banana-producing countries with an irreplaceable loss of germ plasm and research in progress based upon nearly 50 years of effort. Continued research aimed at developing varieties resistent to black sigatoka, a disease presently costing the banana industry $100 million a year in Central America and Panama, is urgently needed. Some research, particularly that related to specific production problems, will continue to be developed by multinational corporations. Yet the trend of some of these companies to switch from vertically integrated enterprises to brokers suggests that producing countries may have to become more involved in the investigation of production-related problems. Moreover, while research efforts have been undertaken on other traditional export crops, these have been undertaken only on a very limited basis, remain weak, and have not always been coordinated with and disseminated to producers.

Weak development and diffusion of technology has particularly affected smaller-scale farmers producing basic foods, including the basic grains. Technology is available which promises significant returns with minimal risk. The IARCs have developed improved varieties and techniques that have the capability of improving production significantly. Where such technology has been introduced and adapted in Honduras, it has had positive results (e.g., rice). But Honduras is not presently taking full advantage of the work of these centers. Adaptive research is required to determine how technology developed in these centers and elsewhere can be best used to meet local needs. At the same time, ongoing research is needed to stay ahead of continually emerging disease and insect problems.

The need for improved agricultural research in Honduras was noted by the previously mentioned Presidential Agricultural Task Force (PATF), the S&T Research Priorities Field Team (RPFT) and, most recently, the National Bipartisan Commission on Central America (NBCCA).

D. Constraints to Effective Agricultural Research

With the help of international donors, including AID, Honduras has carried out numerous efforts to develop its agricultural research program and effectively disseminate production-increasing technologies to its farmers. Positive results have been achieved which should not be minimized. The introduction and adoption of short, high-yielding rice lines from Tropical Agricultural Center for Research and Training (CIAT) (CICA 6 and CICA 8) during the late 1970s, for example, contributed to making Honduras self-sufficient in rice and to the country's becoming an exporter in 1982/83. Yet, numerous constraints have afflicted research efforts, many of which continue to seriously inhibit the operation of an effective research dissemination program. On the public sector side, these constraints closely resemble (and in some cases are identical to) the problems affecting LDC agricultural research programs throughout the world. A 1982 AID program evaluation discussion paper on the Agency's research experience summarized these as follows:

-- the inability of host governments to support or make a commitment to agricultural research over the long term;

-- tight budgetary restrictions leading to government manpower and resource shortages;

-- the lack of qualified counterpart personnel to work with expatriate technicians, together with low salaries for host country researchers, making it difficult to maintain good staff;

-- the instability and lack of long-term focus caused by the above constraints;

-- the generally short-term duration (three to five years) of many donor programs;

-- weak linkages between research and extension and between international research networks; and

-- the inability of AID to technically assist and supervise long-term research efforts.

Perhaps the key constraint to effective research in Honduras has been the inherent instability of GOH programs. As in other countries, tight budgets, particularly in recent years, have considerably reduced the magnitude and quality of these efforts. Low salaries have resulted in high turnover, severely reducing an already limited human resource base. A 1981 evaluation of the Agricultural Research Project (522-0139) concluded:

> "Project accomplishments (i.e., the GOH research system) did not have as great an impact (as expected) due to a series of unresolved problems. These problems were both short- and long-term in nature. The major short-term problem was high turnover of research personnel due to institutional problems. This led to a lack of continuity in research efforts, especially at the field level. The more long-term problems resulted in lack of direction and focus, as well as varying results in the actual research policies, the inability to effectively plan research activities and coordinate them with other research efforts, and an inadequate administrative structure to accomodate a strong research program...."

There are also numerous structural constraints to the adoption of technologies in Honduras: limited access to productive resources, including land and credit; a weak marketing structure; and limited investment in rural infrastructure.

E. Project Rationale

1. Design Background. In light of this experience, a general consensus has been created among Honduran, AID and other experts that, while an expanded research program in Honduras is a necessity, the current system

precludes the possibility of effectively carrying out this objective. With this premise, USAID/Honduras and GOH thinking turned to the creation of alternative models to undertake the needed effort. A number of different events and initiatives converged to underscore the need for such an effort and influenced its design:

- the country's serious economic problems and need to diversify agricultural exports;

- the movement in the Honduran private sector to take a more active role in agricultural production and processing, particularly of non-traditional export crops;

- the GOH's willingness to divest itself of certain functions and responsibilities in agriculture;

- the availability of the La Lima research facility for donation to a private organization; and

- the opportunities afforded by the Caribbean Basin Initiative.

In addition, the U.S. Presidential Agricultural Task Force, which came to Honduras at the request of President Suazo in October 1982, reviewed agricultural policies and the state of technology for small and medium-size farmers and recommmended the "creation of an Agricultural (Research) Institute which would require time, energy and money, and would be effective only if it could be kept relatively free of political pressures." It further recommended that "the government should not enter directly into the operations of the Institute, leaving policies to be set by a board of directors that is informed and acts in concert with government policy."

Upon the departure of the Task Force, a Bilateral Commission was created consisting of top level Honduran and U.S. government officials to coordinate implementation measures. Several sub-commissions were formed to review the report and make specific implementation recommendations to the President of Honduras. Among the recommendations of the Agricultural Research and Extension Sub-commission are the divestiture of agricultural research from the GOH and the creation of a private research foundation supported by a more administratively autonomous GOH extension program.

The GOH is now ready to respond to the various recommendations that have been made regarding the need to improve the country's agricultural research program. The Mission, in conjunction with the GOH, has examined different institutional approaches to expanding and improving the Honduran research system. These options, amply described in the PID, are:

- strengthening the present system;

- creating a semi-autonomous or autonomous public research institute;

- building an expanded research network into Honduran agricultural education institutions; and

- establishing an independent, private research foundation with limited government participation.

The availability of the La Lima facility strengthened the idea of undertaking the latter option, which is a distinctly unique research approach in Honduras and, for that matter, in developing countries in general.

2. Project Rationale. Technological change in agriculture can serve as a critical link in the long-term economic growth of Honduras, both in terms of diversifying the country's narrow export base and sustaining an adequate level of basic grains production for the increasing population.

The establishment of an independent, private research foundation is the most effective way to overcome the aforementioned administrative and political deficiencies of previous research programs, to involve the private sector in supporting its own technological needs, and to support the public sector research agenda. Free of political machinations and supported with adequate funding, the foundation will be in a position to attract and keep the best human resources available in Honduras and abroad. The foundation will also be in a position to provide the stable and long-term research outlook which has been missing in Honduras and elsewhere. The establishment of a private research foundation offers an unusual solution to the problems governments the world over have faced in their attempts to create institutions with the stability of personnel and expertise required for agricultural research while maintaining the flexibility required for sound research programs. Managed with ingenuity, the foundation will emerge as an effective institution capable of assimilating the best from past and present institutions and making a significant contribution to the well-being of the Honduran people.

III. PROJECT DESCRIPTION

A. Goal and Purpose

The USAID goal to which this Project contributes is to increase incomes for farmers and generate additional employment in Honduras. This will be done by increasing the productivity of the Honduran agricultural sector, particularly the small and medium-size farmers by improving their access to quality research services.

The purpose of the Project is to establish an agricultural research foundation which will expand and improve the agricultural research system in Honduras and enable it to be more responsive to the technological needs of farmers, particularly those producing non-traditional crops for export. The non-profit, private research foundation for agricultural research, the Honduran Agricultural Research Foundation (Fundacion Hondureña de Investigacion Agricola - FHIA) will be capable of orienting and supporting

agricultural progress in the country and linking it to the other public and private organizations in a way that maximizes their collective effect on production.

FHIA's contribution to Honduras' agricultural research program, to increasing agricultural productivity, and to its export diversification strategy will be evidenced in numerous ways. It will respond efficiently to the growing technological/production needs of Honduran agricultural export producers, thereby filling a significant gap in the export promotion strategy. FHIA will be an important link in the commodity systems approach being implemented as part of the country's export diversification strategy. FHIA will also serve to upgrade the human resources of Honduras' agricultural sector through its in-house training and exchange programs. Finally, the Foundation will be able to tap resources - financial as well as human - that may otherwise not be available to the country with another research mechanism or model. The Foundation will maintain a first-rate technical staff and will receive grants, endowments, and contracts from a variety of national and international sources.

B. End-of-Project Status

By the end of the AID-financed implementation period, it is expected that FHIA will have become solidly established as an internationally recognized institution. It will be supporting a prosperous and expanding Honduran agricultural export economy that will include thriving basic foods production both for export and for creating a reasonable level of food security and nutrition for the Honduran people. Staff upgrading through the Foundation's training activities will have produced steadily increasing numbers of Honduran personnel in middle- and upper-level research and administrative positions.

Expected general outputs include:

1. an internationally recognized foundation, established and functioning with a broad, representative funding base;

2. an ongoing research program consistent with the needs of Honduran producers, particularly small- and medium-scale farmers, developing technologies which support the production of non-traditional export crops, traditional export crops, and basic food crops;

3. a viable communications network that ensures the rapid two-way flow of reliable and relevant information among institutions involved in the agricultural technology development and transfer process; and

4. an efficient analytical capability for providing accurate pest and pathogen diagnoses, soil fertility and crop nutrition status, pesticide residue determinations, product quality control data and other laboratory services to clients interested in contracting for such services.

C. Project Beneficiaries

The Project will have at least four major beneficiary categories. First, there are those farmers who will directly adopt research technologies and whose production and incomes will increase as a result. This group includes small- and medium-sized farmers in all three areas of emphasis. A second major category of beneficiaries are producer groups which enter into processing and marketing activites related to crop production. Export diversification crops will provide a strong stimulus in this area. Third, it is expected that increased production will significantly increase jobs in the rural sector. Finally, consumers, particularly rural and urban poor who consume basic food crops as well as fruits and vegetables, will benefit from increased and improved production (see Annex III. F., Social Analysis, for a detailed description of Project beneficiaries).

D. Project Strategy

The Project strategy is based on four pillars reflective of FHIA's guiding principles: (1) research programs will be carefully targeted and in line with Honduran priorities and development objectives; (2) linkages will be sought with other research technology efforts to enhance impact and reduce costs; (3) dissemination channels will be strengthened; and (4) FHIA will establish an independent financial base within the shortest time frame possible.

The level of research efforts required in Honduras neccesitates that FHIA be circumspect in its selection of research programs and establish clear research criteria and priorities. At the beginning, it will undertake a small number of programs which will be well conceived, adequately staffed and properly financed and managed. In this way, it will be able to deliver reliable and needed information on a timely basis. Consistent with Honduras' export promotion strategy - and with the need to fill an important technological gap in this strategy - priority will be given to non-traditional export crops (including post-harvest, packaging and handling technologies) which account for 39% of A.I.D. funding for research under the Project. A principal tenent of the research program for non-traditional crops is that it will be closely coordinated and run parallel to the non-traditional export promotion program that will be initiated under the Export Development and Services Project (522-0207). Traditional export crops (including the banana breeding operations) and basic food crops (where the GOH will retain primary responsibility) will be second and third order of priority, respectively.

A key element in the operational strategy of the Foundation will be the establishment of sound linkages between public and private, and national and international, research programs. FHIA cannot go at it alone. It will serve as a mechanism to tap into the substantive research efforts and investments being made worldwide and will provide a clearinghouse for the adaptation of this research in Honduras. In non-traditional and traditional export crops, linkages will be established with U.S. universities, USDA, and other producing countries and associations. Primary linkages in the basic food crops will be with the International Agricultural Research Centers (IARCs) through

cooperative agreements and technical assistance. Through these agreements and coordination with the IARCs, FHIA will be able to enhance the GOH's own research program. While the banana breeding program will require continuous basic research, efforts will be coordinated and shared with other producing countries and be closely linked with the proposed International Banana and Plantain Network.

FHIA will strengthen present dissemination channels throug outreach programs directed to producer groups. It will work closely with those organizations currently providing extension services (the GOH, producer associations, PVOs, etc.) and enhance their own programs. Training of extensionists from these institutions is also an integral part of this effort.

Finally, a key element in Project strategy is that the Foundation will establish an independent financial base through a professional fund raising program led by specialized staff and, in particular, by its Board of Directors (including its international representatives) and its Director General.

E. Description of Project Activities

1. Foundation Organization

a. Description. The Foundation will have a Director General, chosen from the best available national and international talent, and will be guided by a General Assembly, a Board of Directors and an Oversight Committee (the latter two include representatives from the private sector, the GOH, and the international research community). The Director General will be the chief executive officer and will exert control through vertical lines of authority extending downward through the Foundation staff. Through the Board of Directors, the Honduran private sector, small farmers groups and other technology users will play a leading role in determining Foundation programs. To enhance coordination of research efforts, the GOH (through the Minister of Natural Resources) will be also be represented on the Board, although the private sector will retain a dominant role.

The Foundation will be divided into two principal Directorates: the Research Directorate and the Communications and Development Directorate. The former will be headed by a Director for Research responsible for the work of senior scientists who will head the non-traditional export, traditional export, multidisciplinary research and analytical services, and basic food programs.

Two principal functions will rest with the Communications and Development Directorate: promoting and ensuring the efficient and effective dissemination of research findings to users - including training through its Training Unit - and assisting the Director General and the Board of Directors in organizational development and fund raising functions. Given the importance of establishing an independent funding base in the shortest time possible, this latter function should be emphasized. The Communications and Development Directorate will also be responsible for maintaining library and other informational services.

Collaboration and close coordination between the two Directorates will be an integral element in the Foundation's operational procedures. The principal function of the Foundation is research. But for research to have the desired impact, an effective communication and outreach program must be in place and the Foundation must be assured of its long-term financial viability. In essence, the two Directorates will function as one overall program guided by the Director General.

b. Outputs

1. A legally constititued Foundation established and operating effectively. On May 14-15, a founder's meeting of the Honduran Agricultural Research Foundation was held at La Lima. Twenty-eight people attended the meeting as founders, including representatives from the GOH, USAID/H, the private sector (Honduran and international, including United Brands and other multinationals), educational institutions, producer organizations (including representatives from the major small farmer federations), and the international research communities including internationally recognized research scientists. At the completion of that meeting, a full set of by-laws was unanimously approved, an interim Board of Directors and Oversight Committee were named, and a commission was appointed to select both an interim and permanent Director General. On June 7, Honduran President Suazo signed Decree No. 85 which legally constituted the Foundation in Honduras.

The Interim Board of Directors convened its first official session on June 28, 1984. An interim Director General and Deputy Director were named to fulfill the functions of those positions until the permanent Director is selected, in order to ensure a smooth transition from United Brands Co. to FHIA. To support the latter objective, the Mission and the GOH jointly reprogrammed $100,000 from the Agricultural Sector II Program as a grant for bridge financing to cover initial operating costs. Agreements have been reached with UBCo on important operational issues such as the provision of school, hospital, utility, and other services for the Foundation and its personnel. Tax-exempt status, duty-free import, and other necessary support have been successfully negotiated with the GOH.

In addition, a parallel U.S. corporation, the Friends of Central American Agriculture, was legally incorporated in the State of Delaware on June 20, 1984. This corporation will provide FHIA with a fund raising channel for tax-exempt donations and assistance from the United States. Its by-laws are exhibited in Annex III.H.

Official solicitations for candidates for the full-time Director General were initiated in late July, and it is expected that the person contracted will be on board by January 1985. A Board of Directors, which will consist of representatives of exporter and producer associations, other private sector organizations, the GOH, and the international research community, will be elected by December 31, 1984. Timely technical assistance will play a key role in establishing the Foundation's administrative operations.

c. Inputs

i. Personnel. The Director General of the Foundation will have primary responsibility for administering the Foundation activities. He/she will be responsible to the Board of Directors, will assume full responsibility for all FHIA programs and will be its chief executive officer. As described below, the Director General will also work closely with the Communications and Development Directorate in designing and undertaking effective fund raising efforts.

The Director General will have the following characteristics:

Experience: The Director General will be a scientist of international prestige and will have contributed to agricultural research and training in a significant manner. Of equal importance, he/she should demonstrate knowledge of agribusiness, given the focus of the Foundation in promoting exports. He/she should also have proven management and administrative capability. Demonstrated knowledge of tropical agricultural conditions and opportunities, especially in Latin America, is also an important characteristic.

Training: The Director General will preferably have obtained a Ph.D. or equivalent in some field of agricultural sciences.

Language: The candidate must be fluent in Spanish and English.

Personal Characteristics: The candidate should possess leadership qualities, moral integrity and have the demonstrated ability to work with people, institutions and governments. He must be creative, imaginative, agressive and a risk-taker. He must be articulate and have confidence, ability and presence.

The candidate must be able to mobilize resources, think positively and have good health and staying power. Finally, above all, the Director General must have proper motivation to help the people of developing countries to improve their income and diets through effective research, training and development.

ii. Technical Assistance. The Director General will require help immediately to set up accounting, inventory, and other computerized financial systems. Approximately six person-months of technical assistance will be required for financial analysis and three months for the services of a data management specialist. In addition, approximately six person-months of agricultural engineering technical assistance will be required to put experimental plots and farms in operating order.

iii. Equipment and Materials. A summary of equipment and materials presently available through the United Brands donation appears in Annex III.K. A complete inventory is available from USAID/H.

iv. Summary Core and Administrative Budget
(US$ 000) 1/

Description	1984-85	1986	1987	1988	1989-93	TOTAL
A. Administrative/Operating Costs	1,285	1,049	812	856	5,191	9,193
1. Salaries, Benefits, & Allowances 2/	770	516	541	568	3,297	5,692
2. Travel and Per Diem 3/	69	52	58	65	464	708
3. Operating Expenses	146	141	158	178	1,300	1,922
4. Professional Services 4/	25	22	22	23	130	223
5. Technical Assistance 5/	275	319	33	22	-	649
B. Capital Investments	1,369	-	75	-	674	2,118
1. Improvement Existing Facilities	385	-	-	-	-	385
2. Vehicles	140	-	75	-	210	425
3. Office Equipment	65	-	-	-	65	130
4. Radio Communications Equipment	24	-	-	-	24	48
5. Data Processing	25	-	-	-	25	50
6. Agricultural Equipment	200	-	-	-	-	200
7. Laboratory Equipment	400	-	-	-	200	600
8. Communications Equipment	130	-	-	-	150	280
C. Contingencies	178	78	75	75	75	381
TOTAL	2,732	1,128	962	931	5,810	11,692

1/ See Annex III Exhibit G for complete breakdown.
2/ Director General and three Directorate Heads.
3/ Includes Board of Trustees.
4/ Legal, audit, etc.
5/ Includes approximately 95 person-months.

2. Research Program

a. Description. The Foundation's research program will be aimed at the development of technologies adaptable to Honduran agricultural zones and production conditions. The methodologies required for the solution of production problems are, in fact, usually multidisciplinary and neither solely basic nor entirely applied. Rather, solutions require an appropriate combination of both approaches. Specific research methodologies will depend, of course, on the specific crop and problem being addressed. While longer-term efforts will be needed in some areas, research will focus for the most part on those crops and those production problems where payoffs can be expected within the shortest time frame possible.

The Foundation will be commodity-oriented in its research programs. It will work in research teams under program leaders selected from the best talent available in Honduras and internationally. Research associates and assistants will be given an opportunity to receive training and to move into the principal staff ranks. Research teams will be organized after in-depth studies of the commodities to be selected for research have been conducted. These studies will be undertaken by contracted experts in these fields. Once production problems are identified, scientists will be selected and the research team will be assembled. If post-harvest problems are identified, specialized staff will be hired for that research.

The on-station research will be combined with field trials and farmers will participate in the final evaluation of results. This process will require collaboration not only with farmers but also with numerous producer organizations and private voluntary organizations presently working in Honduras. Associations and cooperatives will participate with the Foundation, especially through in-service training of their personnel who work directly with farmers.

As described in more detail in Section V., a number of criteria will determine the selection of commodities for research. These include the profitability and marketability of the commodity, its adaptability to Honduran conditions, macro-economic considerations (i.e., the commodity's potential impact on the Honduran economy), and the familiarity of Honduran producers with the commodity in question. Initial research efforts will focus on the continuation of the important ongoing banana breeding operation and adaptive research on a few selected non-traditional export crops in line with the needs of Honduran agricultural exporters, particularly the Honduran Federation of Agricultural Producers and Exporters (FEPROEXAH), cooperative federations and other groups that will exert a demand for research findings. As cooperative agreements are signed with the International Corn and Wheat Improvement Center (CIMMYT), International Center for Tropical Agricultural (CIAT), Tropical Agricultural Center for Research and Training (CATIE), and other regional and international research centers, the Foundation will begin collaboration with the GOH on research in basic grains and food commodities. Work on traditional crops other than bananas could begin immediately when funding for such a program is secured.

Once a crop is selected to be included in the research program, plans to carry out the necessary research will be prepared by the Research Directorate. These plans will include arrangements for additional full- or part-time staff as well as the acquisition of materials and equipment and arrangements for land on which to perform the research (either at the Foundation or on the property of collaborating producers, or both). The plans will also include collaborative arrangements with other research institutions, if needed. Research results will be field-tested several times to assure appropriateness.

During the first few years, the Foundation will develop three or four commodity programs in which it can show rapid progress, expertise, efficiency and competency. The numbers and types of crops to be studied will be carefully selected, and sufficient resources will be dedicated to these to obtain results before undertaking additional crops. The research program will be divided into two general types of effort: contracted research and research supported by grants and endowments. The former will in all likelihood be geared toward shorter-term solutions. Varietal screening, selection for quality, specific disease and insect resistence, and appropriate packaging and handling are illustrative of the types of research that may be contracted by private sector interests. Foundation clients will be drawn into the process over the life of contract, particularly during field testing. The new technology will be passed to the client and the financial accounts under the task will close.

Research financed with grants and endowments will maintain a practical "result/impact" orientation but will also be undertaken in areas where, for numerous reasons, private financing is not available and where, on some occasions, the research may be more of a medium-term (three to five years) effort.

c. Outputs

i. Expanded Production of Non-Traditional Crops for Export. Two factors mentioned earlier make the expanded production of non-traditional crops for export a principal priority. First is the economic weakness of the narrowly-based traditional Honduran crops. Second is the GOH policy which emphasizes the need to diversify that traditional export base. Another factor is the great interest that the GOH, USAID, and FHIA founding members have in this area, as expressed through the Export Development and Services Project (522-0207). FHIA and those organizations participating in the export promotion program will closely interface and will be mutually supportive. An expanded discussion of the relationship between the two projects is provided in Section IV., Program Factors, and Section V., Summary of Technical Analyses. Finally, a summary of the relationship between the two projects is presented in Annex III.I.

The major output of Foundation research will be the provision of a technological base, i.e., appropriate technologies, to catalyze a major expansion of Honduras' non-traditional agricultural exports. As indicated earlier, this effort will be closely coordinated with the commodity-systems approach being implemented under the Export Development and Services Project. FEPROEXAH and other institutions will provide constant input into research priorities and feedback on developed technologies and will contract for specific research efforts. This key input will also be provided by the "channel captain" which will guide the development of the commodity system -

be it FEPROEXAH, another Honduran federation or private enterprise, or a U.S. or other international private investor or firm.* The commodity system is based on the overall set of knowledge, skills, institutions, practices and resources necessary for profitable production and marketing of a crop. Each crop or crop group is viewed as having unique characteristics requiring specific analysis and implementation. Each commodity system is composed of numerous factors, from adequate soil and water conditions, and pest and fungus control, to specific market requirements. The system's line operation is the grower-processor-shipper-marketer chain which moves the product from production to consumption. Naturally, a key element of this chain is the production and post-harvest function where adequate research and development play a critical role. The strategy of the export promotion program and of this Project is that FHIA will play a key role in this operation by providing the investigative knowledge necessary to effectively complete the grower-market operations chain. The growth and development of FHIA programs, staffing, and operations have been planned and will be managed to emphasize activities supporting commodity systems with significant prospects for easily profitable operations. Market intelligence and other technical information will also be provided to FHIA vis-a-vis linkages to efforts under the Export Development and Services Project. In summary, the entire export process - including the Foundation's research program - will be vertically coordinated to ensure maximum return from each individual effort.

Specific research to be undertaken will be determined by the criteria listed above and the identification, through producer linkages, of specific production or post-harvest problems to be addressed. Based on detailed studies to date, good candidates for the diversification program during the first few years of operation include citrus, cocoa, and winter vegetables. These are crops or crop groups with excellent export market potential. They meet the criteria for research identified earlier, and it appears that applied research can make a significant contribution to sustaining their export-oriented production. Studies indicate that over the medium- and longer-term, spices, ornamentals, colorants, pejibaye palm, and other tree crops also appear to have excellent potential. Crops which had high U.S. tariff protection until approval of the CBI will also receive priority. Results of these research efforts will be disseminated to beneficiaries through producer associations incorporated under the commodity systems approach.

---

* In accordance with the commodity-systems approach, the "channel captain" will be a firm or individual who will ensure vertical coordination of the producer-to-market operational chain. On the production side, it will ensure that there is an adequate technology base for undertaking intensive cultivation of a crop to ensure compliance with the strict requirements of the market (such as quality control) and with the operational implications of those markets (such as rigorous cultivation practices).

Annex III.A. includes an illustrative list and description of the types of research efforts that may be undertaken by the Foundation and the resources required for these efforts. The specific research program to be conducted will depend heavily upon the intensive review of the commodity systems process. Assuming that continued analysis supports the approach, FHIA will begin non-traditional export research with winter vegetables and citrus fruit, moving as quickly as feasible to initiate research on cocoa. Research on the additional commodities listed above will commence when the former programs have been established and, of course, when the Foundation itself reaches a financial and administrative position to embark upon a program expansion.

To provide the necessary linkages with groups and institutions already undertaking research in this area, arrangements will be made to provide long-term and short-term technical assistance. One possible participating institution is USDA through its Office of International Cooperation and Development (OICD). OICD is responsive to this type of assistance due to its mandate to assist in implementation of the CBI. Preliminary conversations have already been held with OICD in citrus research assistance. Likewise, U.S. universities offer excellent possibilities for technical assistance.

In cocoa research, the Foundation will work closely with the Honduran Cocoa Growers Association (APROCACAO) and with FEPROEXAH, of which the former is a member. The Hershey Corporation, of the U.S., has expressed interest in purchasing Honduran cocoa production and in providing technical, financial and other assistance to the research effort to be administered by the Foundation. The Foundation's cocoa research agenda is expected to include: (1) hybrid trials, (2) fermenting and drying systems improvement, (3) small cocoa grower inter-cropping, and (4) collection, processing and transportation systems in remote areas. The Foundation will work closely with the La Masica hybrid seed project currently being operated by INA.

In undertaking citrus research, the Foundation will work closely with the National Association of Citrus Growers (ANACIHO) and with FEPROEXAH. Expansion of orange juice concentrate and of whole Valencia oranges, Henderson and Ruby-red grapefruits, and Persian limes for the U.S winter market and year-round markets in other areas are the present export objectives. One of the key research points as regards citrus will be its susceptability to virus diseases. The majority of the trees in Honduras are budded on sour orange, an excellent rootstock, but one particularly susceptable to Tristeza, a virus disease that has caused great economic damage to many citrus production areas in the world. While the disease and its vector have not been found in Honduras, research is needed in this area. There are, however, several virus diseases that have been identified in the country. Most of these trace their origin to the use of infected budwood. Once trees are infected, little can be done to save them, and removal and replacement is the only alternative for the producer. At present, there is no source of certified rootstock and budwood in Honduras. In addition, there is no established system for indexing trees that may be infected with viral diseases. Therefore, it is not presently possible to certify trees intended to be used as sources of budwood as being disease-free.

The Foundation will work with other institutions such as the Pan American Agricultural School to implement a program for indexing and certifying plant material intended to be used in the renovation of producing citrus orchards and in the establishment of new ones. This is an important task but one which should be undertaken only under strict supervision by highly qualified personnel. Pest control research - particularly a preventive program on Mediterrenean fruit fly - is also urgently needed. The presence of other insects in Honduras has resulted in stringent quarantine requirements in the U.S., thus limiting opportunities in that market. FHIA will undertake soil and foliar analysis programs to assist researchers and producers in solving problems of plant nutrition/fertilization that affect yield and quality characteristics.

In vegetable-oriented research, the Foundation will work with FEPROEXAH's Center for Agricultural and Agroindustrial Productivity, which will be in charge of technology dissemination to vegetable producers through technical assistance and training. Consistent with the commodity-systems strategy, the initial emphasis will most likely be given to cucumbers, okra and onions, although research in additional vegetables may be opportune. For example, commodity specialists may determine that problems - and solutions - for a crop are readily known and available elsewhere, and that the Foundation's efforts should concentrate in other crops with good potential. Disease, insect, nematode and other pest problems will be researched. Post-harvest processing and handling are a major limitation to expanded vegetable export efforts and will be an important part of the research agenda.

Though concentrated in bananas, the La Lima station has carried out substantial work on post-harvest processing and handling for other crops and has established facilities for this work which have been donated to the Foundation. It is expected that, based on the identified demand for these services, handling and packaging improvement will also be an important component of the Foundation's non-traditional export promotion effort. Producer organizations will benefit by having higher quality, less perishible goods to offer to the importers of Honduran products.

It is expected that when AID Project financing is complete, research findings will have been disseminated in at least twelve non-traditional commodities and varieties, generating approximately US$65 million.

ii. Increased Productivity of Traditional Export Crops. Bananas, coffee, tobacco, meat products, lumber, and sugar cane are the traditional export commodities in Honduras. The Foundation will concentrate its initial traditional export crop efforts on managing the continuation of the world-renowned banana/plantain breeding program at La Lima. Continuation of the program is important for several reasons. Despite a depressed market, the banana industry is now, and most likely will continue to be, an important pillar of the Honduran economy and foreign exchange earner (contributing to approximately 20,000 jobs and generating approximately US$220 million in foreign exchange per annum). Bananas and plantain are also a major food crop.

During the last fifty years, the La Lima breeding program has resulted in significant accomplishments. For example, Panama disease, a devasting fungal wilt, was overcome through the selection of resistant Cavendish types leading to commercial varieties currently in use. Selected short-stature Gran Nain types developed at La Lima have also saved the industry millions of dollars by reducing blow-down damage to plantations. At the present time, the program is geared towards the production of new black sigatoka-resistant commercial varieties, and considerable progress has been made. Yet banana and plantain breeding is a slow, difficult operation requiring perseverance and a long-term commitment. It is currently estimated that the breeding efforts are approximately five to seven years away from the development of a commercial variety resistant to black sigatoka. The Foundation will maintain the locus of research excellence in plantain and banana breeding and the irreplaceable germ plasm bank, considered by many to be the best in the world. A leading banana/plantain breeder who ran the program for United Brands will continue as an employee of the Foundation. Since producing countries and multinationals will benefit from the program, AID funds are not contemplated to support the program directly. Interim funding for this program has already been secured by the FAO, and the FAO has agreed to coordinate funding efforts through other producing nations and international organizations. United Brands and other multinationals have also expressed written interest in funding the breeding operations (see Annex IV.J.). The breeding program will continue to utilize standard breeding techniques and, with appropriate funding and expansion in the future, will consider other methods such as induced mutation or somatic hybridization in order to produce lines resistant to diseases such as black sigatoka.

Over the medium-term, FHIA will initiate a plantain production-oriented research program. Despite substantial differences between banana and plantain production, little work has been done on the plantain side (banana production has, of course, been investigated in considerable detail by producing companies, which will maintain this emphasis). In fact, one of the few internationally available publications on plantain production was produced at La Lima some years ago.

Research on coffee-related problems is currently being undertaken by the Honduran Coffee Institute. It is expected that, over time, the Foundation will be in a position to collaborate with the Institute in areas such as: (1) testing of fungicides for the control of leaf rust and insecticides for the control of the coffee bean borer, (2) testing of low-volume spraying equipment (which could be combined with similar work on cocoa), (3) investigating shade-fertilizer-yield relationships, and (4) monitoring the diseases and insects which appear on the crop. FHIA will also be able to assist in the coffee crop diversification objectives of the Institute. While the idea is not to begin major traditional crop programs other than banana and plantain until the Foundation is well established, some preliminary work on coffee rust, in conjunction with the Coffee Institute, could begin in the second or third year of operation. The rationale for this strategy is the compatability between cocoa and coffee research as described in Annex III.A. A Cooperative Agreement will be signed with the Institute, which will describe research

coordination and delineate research responsibilities. The focus of such research, as emphasized previously, will depend on a careful evaluation of the research being conducted by other institutions, national as well as international, so as not to duplicate efforts.

Lastly, the Foundation could investigate pasture improvement techniques to the benefit of cattle production and meat exports. Another possibility in traditional export crop research is contract-financed research on blue mold and other tobacco problems.

Although AID funding is not anticipated to directly support the banana/plantain research program, the FHIA will provide administrative support to the activity. It is expected that, within the first ten years, a new black sigatoka-resistant variety of banana or plantain will have been developed and that germ plasm distribution will have begun, resulting in a savings to banana-producing countries on an order similar to that for Honduras, which spends $15 million annually on black sigatoka control.

iii. Increased Production of Basic Food Crops. Maize, beans, sorghum and rice are the four mainstays of the Honduran diet. Research on these crops will focus on adapted varietal improvement and seek to overcome current technological constraints associated with low productivity of target crops. Research will also focus on finding appropriate controls for the large number of pests, such as the bean slug, which take a significant toll on the production of these crops. Of particular importance will be soil-plant relations (fertility, conservation), pest control (weeds, insects, pathogens), and post-harvest practices (drying, storage). The obtention of early maturing corn and sorgum types will help alleviate current losses due to erratic rainfall and droughts. In addition, sorghum downy mildew affects all local corn and sorghum. Types and varieties resistant to the disease must be identified and made available to producers.

The research program will take into account the physical and socio-economic constraints of target farmers. Building upon USAID-supported efforts, a farming systems-approach will be followed in seeking solutions to present crop production problems. Due to the GOH's strong commitment in basic food grains, the Ministry of Natural Resources will participate in this program through direct contributions to the Foundation, contracting for specific services, or a combination thereof. It is envisioned that the GOH Research and Extension Service will serve as the principal government liaison with the Foundation and will work closely with the Foundation's Basic Grains Program Director. In addition, the Foundation will provide training for government and private extension workers in the use and application of the technologies developed and adapted. Prior to the initiation of the basic food crops program, an inter-institutional agreement will be signed between the GOH and FHIA which will outline specific responsibilities, cooperation strategy and other key points. While cooperation with the GOH is essential, FHIA will maintain an independent posture in this and all other programs.

The key element in the basic grains and foods program will be to establish strong links with the IARCs and to take advantage of the substantial investment being made by the centers in specific crops. The centers are engaged primarily in research on basic food crops and this research should not be duplicated but rather transferred to and adapted in Honduras. Some of the research, such as that done on rice varieties, can be transferred almost directly, while for other crops, additional adaptive research must be undertaken. For example, bean varieties which have excellent agronomic characteristics are available. However, efforts to directly introduce them in the country have failed because they do not have the size and color desired by Honduran consumers. Additional breeding work must be undertaken to obtain these desirable traits.

At present, the MNR research system, like that of many LDCs, is not capable of taking full advantage of the IARC's work. Germ plasm of crops such as corn, sorghum, cassava, tropical forages and rice are readily available from the IARCs and would be valuable to Honduras. The IARCs are willing to establish new types of linkages to LDCs such as those proposed under the Foundation since their mandate is not accomplished until their research results are being utilized economically by the participating developing countries. Yet varieties and cultural practices resulting from other research may not be useable directly and will require some adaptive research. In summary, the basic idea is that with a relatively small amount of funds, the Foundation will be able to tap into the over US$200 million of research that is presently undertaken by the IARCs annually. Cooperative agreements will be signed with appropriate IARCs to implement this cooperation. The precise nature of the agreements will have to be worked out between the Foundation and the centers but several possibilities exist. One alternative is the placement, in part at Foundation expense (supported by the GOH), of selected personnel from these centers directly at the Foundation for specific periods of time. For example, a cooperative agreement between the FHIA and the indicated IARC might be drafted by which the GOH would agree to pay for all local currency costs associated with the technician's presence in the country. Other costs would be paid by the Foundation. Another approach would be the provision of short-term technical assistance by the Center for specific tasks.

By the termination of AID funding for the Project, at least two agreements will have been signed with IARC's to support basic food crops research in Honduras. In addition, yields will have increased by approximately 30%. Moreover, six new varieties of basic grains will have been delivered to producers. Basic food grains production will have been generated, with a net present value of $6.0 million (calculated using a 12% discount rate). By year ten, this would represent a 3% increase in total basic grain value.

c. Inputs

1. Personnel. The Director of Research will be responsible for research operations and a Chief of Program(s) will be selected for each of the major activity groups: non-traditional export crops, traditional export crops, basic food crops and multidisciplinary research and technical analytical services.

This approach will result in a more complete integration of each commodity within each category or group. In this manner, the Director of Research will have only four Chiefs of Program(s) reporting to him. In addition, the arrangement by groups of commodities will facilitate the participation of multidisciplinary research staff (entomologists, soil scientists, economists, pathologists, etc.) who can work on more than one crop or problem.

Since the Foundation will begin its operations with a limited number of research tasks, the Chief of Program(s) will also be activity team leader. Eventually, as research operations expand, team leaders - that is, senior scientists in charge of one specific activity - will be hired and report to the Chief of Program.

Research assistants and trainees will be needed, depending on the commodity involved and the task at hand. These assistants and trainees could also move up in the hierarchical ranks of the organization as they gain experience and skills.

ii. Technical Assistance. Technical assistance will be required to identify specific production problems for research tasks. The modus operandi of the Foundation will be, particularly in the initial years, to contract problem area experts to participate in small teams which will identify and outline specific research tasks. After the regular staff of full-time research scientists has been in place for some years and there is a continuation of research on specific crops, there will be less need to rely on these teams, although they will still be necessary for some specific crops and problems. It is estimated that seventy-six months of technical assistance will be required from these teams during the first three years and another forty-seven person-months through the LOP. In addition, technical assistance will be required to make research farmland operational. This will require a specialist to lead the work on drainage and irrigation, sewerage, fencing and related matters and will require the services of an experienced agricultural engineer who has previously developed experimental stations in the tropics. Approximately 25 person-months of technical assistance will be required for this task over the initial three years of operations.

iii. Land. Suitable land, free from flooding and urban problems, will be a vital part of the Foundation's facilities. The 130 acres being provided to the Foundation from the United Brands Co. donation are being utilized for the banana/plantain breeding program and should not be disturbed. Well-drained land for citrus, cocoa, vegetables, and basic grain programs will be needed. It is estimated that approximately 100 hectares of land will be required by the Foundation during the first three years of operation and that eventually a total of 250 hectares will be needed to support those initial programs and future activities, including pastures and forages. USAID/H and the GOH have agreed to program U.S.$500,000 of ESF local currency in 1984 as a donation to the Foundation for land purchase. A technical team has determined that there is sufficient land available in and around La Lima and has begun to evaluate several available plots in terms of

size, drainage, irrigation, soil type, proximity to urban areas, and price. Negotiations have been initiated with the owners of the identified plots of land, and it is anticipated that FHIA will successfully negotiate for sufficient land to begin operations by the end of CY 1984 (estimated at approximately 35-40 hectares). The Director General and the Board of Directors will continue to locate, negotiate for and obtain land in a timely manner consistent with the estimated needs presented in Table I of Annex III.C. In addition, INA has expressed a willingness to support FHIA's request for suitable land and assist in the necessary acquisition.

FHIA will also conduct trials directly on producer lands as arranged through contracts and other agreements. In addition to the base station, arrangements will be made to collaborate with growers for certain experiments until tree crops being researched can be planted and come into production. Crops such as corn and beans are grown over the entire country at various elevations. Hence, it will be necessary for FHIA to make the necessary arrangements with the GOH and other participating organizations to supply small amounts of land at elevations suitable for the basic grains and other crops (such as oranges) that require research under a number of environmental conditions.

iv. Equipment and Materials. A list of equipment and materials presently available through the United Brands donation is available in the USAID/Honduras Mission and is summarized in Annex III.K. Additional equipment for field experimentation, as well as vehicles, will be needed. In addition, several vital laboratory items need to be replaced while others necessary for an expanded research program are lacking. Equipment for land preparation will be needed. This will include tractors, plows, harrows, rototillers, back blades, disks and similar machinery. Spray equipment, weather instruments, small tools, planting equipment, and other farm equipment will also be needed. In addition, each crop will require a certain amount of special equipment for precision planting, harvesting, threshing, and storage. Special drying equipment will be required for several crops.

A final list of needed equipment will be prepared by specific technical assistance during the final months of program operations. A preliminary list is shown in Annex I.E.

d. Summary Budget for Research
($000)

Description	1985	1986	1987	1988	1989-1993	TOTAL
A. Research Programs						
1. Non-Traditional Crops	508	723	649	557	5,459	7,896
a. Citrus	264	186	186	164	1,038	1,838
b. Cocoa	-	282	195	177	1,134	1,788
c. Vegetables	244	255	268	216	1,315	2,298
d. Other	-	-	-	-	1,972	1,972
2. Traditional Export Crops	-	38	41	45	1,121	1,245
a. Coffee		38	41	45	278	402
b. Pastures & Forages					843	843
c. Banana & Plantain Program	(825)	(713)	(756)	(802)	(4,816)	(7,912)
3. Basic Food Crops	247	264	281	299	1,811	2,902
a. Corn & Sorghum	156	167	178	189	1,160	1,850
b. Beans	91	97	103	110	651	1,052
B. Experimental Stations	167	53	203	66	814	1,303
1. Infrastructure 2/	120	-	74	-	194	388
2. Salaries 3/	47	53	59	66	470	695
3. Equipment 2/	-	-	70	-	150	220
C. Land	500	500	-	-	-	1,000
TOTAL	1,302	1,565	1,159	950	8,904	14,346

1/ See Annex II Exhibit G for a complete breakdown, including technical assitance.
2/ In addition to central experimental farm.
3/ Includes central experimental farm.

3. Communications, Outreach and Institutional Development

a. Description. Although the availability of improved and adapted technology is essential for increasing agricultural production, benefits will be derived from such technologies only to the extent that farmers adopt and utilize them successfully. Furthermore, any research institution, to be most effective in the generation and testing of new technologies, must share information and collaborate fully with other national and international research institutions working on problems relevant to the region. A viable communications network that facilitates the rapid flow of information to and from national institutions working in agricultural extension and, ultimately, the farmers, and to and from other national and international research institutions (and other relevant organizations) will be

established. In addition, FHIA will ensure that, within the shortest time frame possible, an independent funding base is secured that will enable the Foundation to expand its work in order to have the greatest impact on the agricultural sector, and particularly on export promotion efforts. This will necessitate the establishment of good communications channels with contractors (producers) and with those individuals and institutions in Honduras and abroad that will contribute to research programs.

The Foundation will establish a small but effective Communications and Development Directorate. This section will establish links to: (1) national and international agricultural research and education institutions; (2) producer, processing, trade and other private sector organizations; (3) the National Extension Service and, to a limited extent, directly to farmers; and (4) potential sources of research grants, contracts, endowments, etc. The Directorate will collaborate with the Office of Agricultural Communication and Public Relations in the Ministry of Natural Resources in the development and operation of a National Agricultural Communications Network (described in Annex III.B.). Also, modern communications technology will be used to: (a) produce materials in various media targetted for each audience, (b) improve the quality of training provided for extension workers, and (c) maintain a computer-based research data and information service readily accessible to all members of the network.

Staff of the three crop programs will report research progress and results to the Communications and Development Directorate for placing in the data/information bank, collaborate with the Directorate in developing and producing materials for distribution through appropriate media to the targetted audiencies, serve as resource people and instructors for training courses, and participate in planning the overall program of the Directorate. As examples, materials to be produced will include: technical reports of research directed toward the research community, recommendation-type publications, graphic presentations of research results, radio programs for national dissemination, short interviews to be incorporated into local programming, slide sets, and instructional videotapes produced in collaboration with the National Extension Program.

b. Outputs

i. Improved Dissemination of Technologies to Farmers and Producers. The Foundation's major clients will be from the private sector, including agricultural export organizations and small farmer organizations, PVO's and other non-public institutions carrying agricultural research and extension programs in Honduras and, secondarily, the National Research Program directed by the GOH. Individual firms and producer associations will draw on the Foundation's services for specific research needs. For example, FEPROEXAH and its members will contract for specific lines of research concerning non-traditional crops. Once the research findings are validated, FEPROEXAH will act as the conduit to disseminate and apply these findings through such private sector mechanisms as for-profit technical assistance companies, training and networking. Specific examples of dissemination channels are:

the associations of citrus producers, vegetable exporters, cocoa producers, plantain exporters, and tobacco growers. Such channels will transfer findings on research activities such as powdery mildew, sigatoka, blue mold, weed controls, and better adapted varieties and technical packages.

The Foundation's staff will also collaborate with the National Extension Service and other GOH programs - including those supported by AID, such as the Rural Technologies Program - in conducting on-farm trials to test new technology, and will participate in field days, meetings, etc., related thereto.

The technology development and transfer process can be truly effective only if it is a continuous and cyclical process. The most crucial testing occurs on the farm, because the farmers lack the necessary resources to imitate perfect growing conditions. Their innate knowledge and experience must enter the decision-making process. If a new variety or technology demonstrates well, the farmers will pass the word and the adoption rate is likely to be higher. Therefore, this Project will seek to continuously consult farmers about their needs and about their attitudes toward particular technologies. The Foundation will conduct surveys and send teams to areas where new technologies are used. Thus, the results will systematically flow through the system to produce a vital knowledge base and close the feedback loop.

The Communications and Development Program and its related activities will ensure the rapid flow of technological information from the Foundation through extension agents and organizations to the farmers, and will feedback information from the field to the Foundation.

By the end of this 10-year Project, the Communications and Development Directorate will have conducted 30 short training courses for MNR extension agents, cooperatives and producer associations and will have produced 30 pamphlets and 20 crop-specific video tapes for use in both training sessions and outreach activities as well as a minimum of 300 half-hour radio programs dealing with specific technologies and their uses and an equal number of two-to-three minute radio spots. In addition, it will have edited three technical books or journals and organized 70 on-farm demonstrations. This unit will have indirectly reached an estimated 100,000 producers.

ii. Stronger Linkages Between National, Regional and International Research Centers. Linkages will be established with international and regional agricultural research centers. As described earlier, ongoing collaborative research projects and linkages will be sought with CIAT, CIMMYT, CATIE, and other regional and international centers. Of particular importance for the banana and plantain breeding program will be immediate incorporation into the proposed International Banana and Plantain Network (see Section IV.B.). National institutions include the Regional University Center for the Atlantic Coast (CURLA), the Pan American Agricultural School at El Zamorano, the National Coffee Institute, and other institutions. The Foundation will:

- develop continuing and effective interchange of research plans, progress reports and results, and other research information with institutions engaged in similar research and/or educational programs;

- facilitate the interchange of germ plasm and other materials that will further the progress of research; and

- develop staff exchange and training programs with international, regional and other national research institutions, and with appropriate universities.

iii. Improved Human Resource base through Training. As indicated earlier, a guiding principle of the Foundation is that training is an integral part of the research-dissemination process. While long-term training per se will not be a Foundation objective, its Training Unit will undertake two types of training to improve Honduras' agricultural research human resource base: (1) training for mid-level to lower-level Foundation personnel, and (2) training for national research system staff, extension workers, and relevant staff of other institutions and organizations. In addition, of course, on-the-job experience will provide a solid training base for many young Honduran and international scientists.

For Foundation personnel, training - in adition to on-the-job experience - will include both academic and non-academic training abroad, which will be handled through agreements between the Foundation and overseas institutions. These agreements will involve Foundation payment for the training and technical assistance provided by the overseas institutions. In both cases, the agreement should be multi-dimensional. For instance, a research institute, in addition to accepting Honduran personnel for training, might send new lines of a crop for field evaluation in Honduras. An agreement with a university might involve not only sending Honduran personnel for training at the university but also participation in Foundation research by faculty of the university through work done on their own campus as well as at the institute. Provision should also be made for the use of U.S. graduate students to work on Honduran agricultural problems. In the latter instances, the overseas institution would contribute an appropriate proportion of the costs.

The training unit within the Communications and Development Directorate, in cooperation with appropriate research staff, will also provide for participation of MNR and private extension personnel. The Unit will also organize the participation of outside specialists.

iv. Enhanced Agricultural Information Services. The library donated to the Foundation by United Brands is one of the best agricultural information resources presently available in Honduras, containing more than a thousand volumes and leading journals. It is now in a static situation due to United Brands' reduced research interest. It will be brought up to date and its coverage will be expanded beyond its present emphasis on banana breeding and production. The library will also maintain contact with one or more of the international services organized for the exchange of

information. Computer services will be needed for this purpose. The library and its related services will be a center of excellence for Honduran agricultural science and technology reference information.

v. Sustained Development of the Foundation. To adequately deliver its intended outputs over the long term, the Foundation must be embraced by a community of Honduran and international organizations, associations and individuals as both users and sponsors. To do this, it is necessary that both sponsors and users have a clear understanding of the Foundation's objectives and operations. FHIA's Communications and Development Directorate, working closely with the Board of Directors and the Director General, will convey to these sponsors the significance of FHIA and its program, and provide a Foundation prospectus and detailed justification for funding needs. It will state in written form how each project will be managed so as to achieve its objectives. In summary, it will be carry out effective and professional public relations work. This action will be key in building a solid reputation for FHIA and assuring that FHIA can accomplish its goals and objectives.

b. Inputs

i. Personnel. The Communications and Development Directorate will be organized into four units, as discussed in detail in Annex III.B. Professional staff will include a Director, Head of Development and Public Relations, Head of Training, and Head of the Communications (Outreach) Unit. Support staff will be required as Foundation functions expand.

ii. Technical Assistance. A major input to Communications and Development will be the provision of long-term and short-term technical assistance as follows:

- assistance in the establishment, organization and operation of multi-media agricultural communications production units;

- support in planning, scheduling and production in various media to provide effective communications support to technology transfer programs; and

- miscellaneous short-term T.A. including evaluation, and radio and other audio communication.

iii. Equipment and Supplies. Project funds will finance basic equipment and materials needs including:

- basic video unit and audio studio
- photography equipment and photo lab
- offset print shop
- a small micro-computer/word processing system, and

duplication equipment and supplies to assist in the development of the information data base and dissemination activities. A list of required equipment is attached in Annex I.E.

d. Summary of Budget for Communications and Development (US $000) 1/

Description	1984-85	1986	1987	1988	1989-93	TOTAL
a. Salaries	153	181	190	200	1,159	1,883
b. Travel and Transportation	12	13	15	17	113	170
c. Equipment Maintenance	2	2	2	2	10	18
d. Training	50	53	55	58	336	552
e. Technical Assistance	459	415	191	-	-	1,065
TOTAL	676	664	453	277	1,618	3,688

1/ For a more complete breakdown, see Annex II Exhibit G.

4. Analytical Technical Services

a. Description. For many years, Tropical Agricultural Research Services (SIATSA), a subsidiary of the United Brands Tropical Research Center, has provided important services for Honduras' agricultural sector. SIATSA has carried out diagnostic, analytical and testing services for public and private sector groups (GOH, farmer associations, animal feed producers and pesticide and fertilizer companies). Fees for these services have, for the most part, been charged at commercial rates. The total number of laboratory tests carried out ranged from a low of approximately 30,000 a year, to 80,000 in 1979. The cash income to SIATSA for these services ranged from $150,000 to $300,000 per year. The Foundation will continue these services, although some modification will be necessary in the various laboratories to be able to meet the expanded needs of the different research programs. For example, the soil and plant tissue analysis facilities, while excellent for the types of work being performed in response to the needs of the United Brands, at present are not exactly those that are required for the operation of a facility responsive to the needs of large numbers of farmers scattered over a diversity of ecological zones growing a broad range of crops. The purpose of the laboratory is to provide the farmer with an economic fertilizer recommendation in the shortest time possible. The laboratory must, therefore, be stocked with the multiple analysis equipment needed to increase the laboratory's output. In addition, in order to supply reliable recommendations to the farmer, the results of laboratory soil and plant tissue analyses must be correlated with the response of crops in the field. This means that field plot tests and tests on pots of soil transported from the field to the greenhouse, using indicator plants, must be done to provide this correlation. Without this information, the probability that a crop will respond favorably to the application of different plant nutrients will not be known. Such information can be used in bringing about one of the quickest and most economic increases in crop yields and will affect the quality of the crop

produced as well. The accumulated information will be stored in a computer, which will further speed delivery of the final recommendation to the farmer. When sufficient data have been gathered, they will be analyzed to show what kinds of fertilizers should be made available in different areas for different crops. This will result in a savings to fertilizer importers which may be passed on to growers.

b. Outputs

i. Continued and Improved Testing Services for Honduran Agriculture. The Foundation's analytical testing component will play a key role in Honduras' export promotion strategy. For example, the Foundation will provide quality control for pesticide/fungicide and other chemical residues and ensure that U.S. and international standards are met. Through an agreement with the Foundation, United Brands will continue to contract with FHIA for these services. Other companies presently contracting for these services have already indicated that they will continue to do so in the future through FHIA.

The Foundation will carry out:

- soil analysis,
- plant analysis,
- water analysis,
- bacterial analysis of processed foods,
- diagnosis of disease, insect and nematode problems,
- quality control analysis of agro-chemical products/fertilizers, insecticides, and nematocides, and
- livestock feedstuff analysis as regards to protein, energy, dry matter, fats, etc.

It is estimated that by the end of the Project, a total of 500,000 separate analytical tests will have been conducted, contributing significantly to Honduran agriculture and generating approximately $4 million in revenue to the Foundation.

ii. Expanded Services to Honduran Producers and Exporters. As the Foundation is established and its links to other export-promotion and producer organizations are more clearly defined, it will be in a position to provide additional services to these groups, such as precise meteorological data for Honduras, which, although presently available, are not sufficiently detailed to provide the kinds of micro-climatic information needed in certain types of disease and insect studies and physiological research on plant performance. For these purposes, the installation of specialized instruments at specific sites will eventually be required. Economic, marketing and other services could eventually also be provided.

c. Inputs

i. Personnel. A Coordinator for Analytical Services (senior chemist, agronomist, soil scientist, or pathologist), which is a department within the Multidisciplinary Research and Technical Analytical Services Unit, will work under the Head of that department. Approximately three technical assistants will head laboratory divisions with support from appropriate lab technicians.

ii. Technical Assistance. Technical assistance will be required to conduct a complete evaluation of the existing laboratories and related equipment at the very beginning of Foundation operation. The specialized T.A. will evaluate present condition of equipment and laboratories and make recommendations for repair and replacement as required. In addition, technical assistance will be brought in several times during the first three years of operations to train personnel in equipment repair.

iii. Facilities and Equipment. The laboratories and buildings presently located at the Tropical Research Center will be donated to the Foundation, although additional equipment will be necessary, as shown in Annex I.E.

d. Summary Budget for Analytical Services

SUMMARY BUDGET FOR MULTIDISCIPLINARY RESEARCH AND ANALYTICAL SERVICES
(US $000) 1/

Description	1984-5	1986	1987	1988	1989-94	TOTAL
a. Salaries, Benefits and Allowances 2/	200	210	221	232	1,342	2,205
b. Travel and Transportation	5	6	7	8	55	81
c. Materials and Supplies for Labs	8	9	10	11	81	119
d. Equipment Maintenance	3	4	5	6	45	63
e. Technical Assistance	143	88	-	-	-	-
TOTAL	359	317	243	257	1,523	2,699

1/ See Annex II Exhibit G for a complete breakdown.

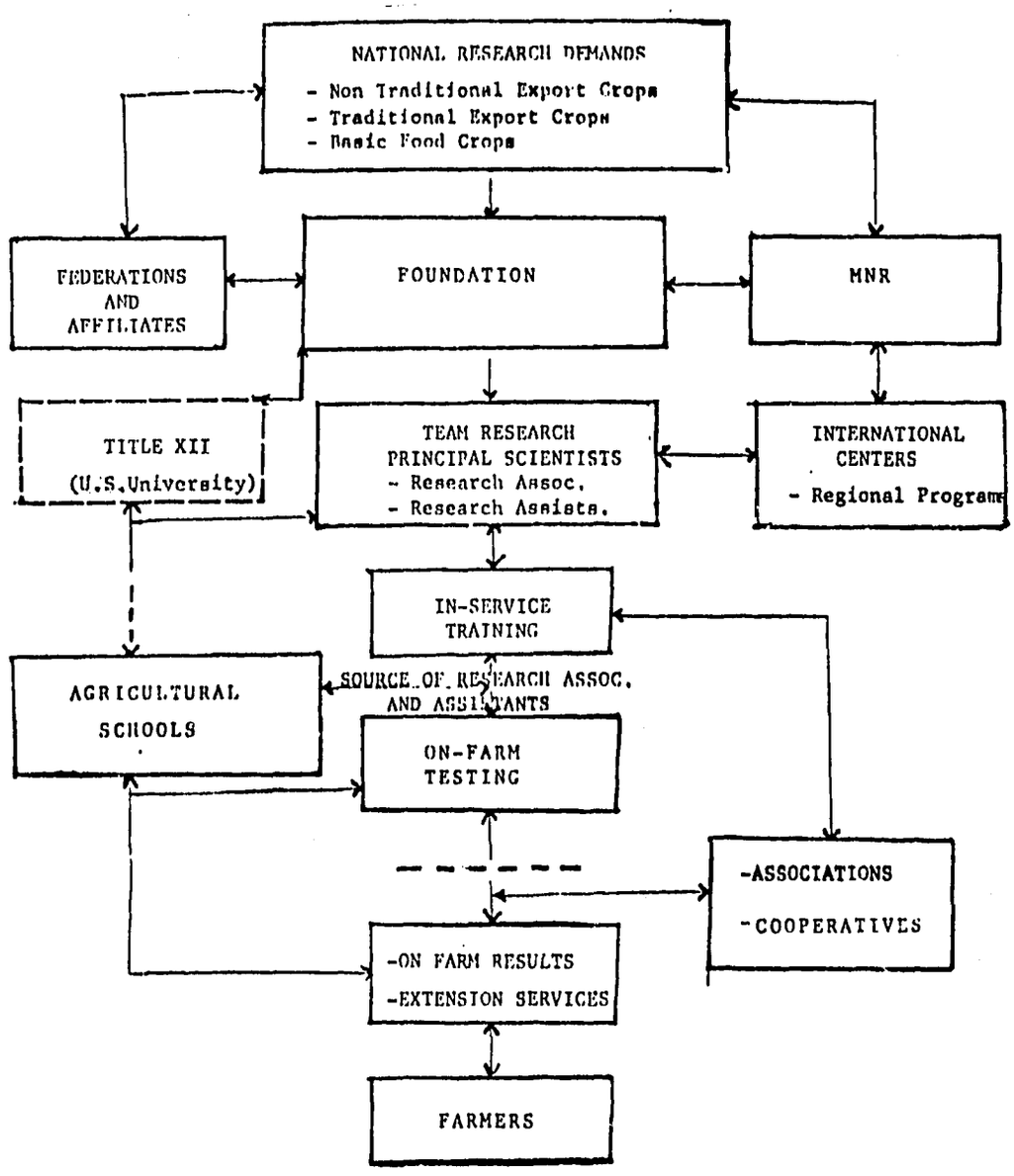
F. AID Monitoring

As discussed in Section VI., Project monitoring will play an essential role in the Project. A Project liaison officer will be contracted by the Mission for a three-year period and will be responsible for day-to-day monitoring of the Project. AID will also conduct three evaluations of the Project during the implementation period (costs for LOP: $375,000, Project Liaison Officer; $200,000, evaluation).

G. Relationship of FHIA to the Honduran Agricultural Research System

Figure 1 below illustrates the Honduran agricultural research system and how FHIA will support and strengthen it.

Figure 1. Relationship of FHIA to the Honduran Agricultural Research System



IV. PROGRAM FACTORS

A. Relationship to AID Programs

1. Relationship to AID and Mission Strategy. As indicated in the Mission's FY 85 CDSS, Honduras' long-term growth depends in good measure on its ability to increase its exports, expand its export base, and apply its capital inflows to modernizing production operations in order to make them more efficient. An important premise in the Mission's development strategy is that now is the time to initiate programs to increase non-traditional exports. This is particularly timely in light of Honduras' recent designation as a CBI beneficiary. Given their importance to Honduras and its people, agriculture and rural development have been and will continue to be the Mission's most important priorities. Mission efforts in the sector will aim to: (1) promote equity, (2) promote private sector-led growth, (3) apply these to the overall strategy of export diversification, and (4) assist Honduras in maintaining a reasonable level of food security and improved nutrition.

FHIA plays a key role in the Mission's long-term development strategy by (1) providing the technological base for increased and sustained production of both non-traditional and traditional export crops, and (2) enhancing existing mechanisms to adapt and disseminate available food crop production technologies which will improve Honduran food security and overall nutritional status. As described below, the Project complements, and is complemented by, a number of new and ongoing Mission programs.

The Project coincides with AID's priority areas to: (1) promote the involvement of private sector approaches in development, (2) assist the transfer of technology, and (3) stimulate institution building. Ongoing discussions between AID and the GOH on the operation of the Foundation provide a useful mechanism to engage the GOH in policy dialogue regarding policy obstacles to the utilization of research findings. Finally, the Project harmonizes with AID's recently outlined research priorities.

2. Relationship to USAID Projects. The recently enacted CBI legislation has opened profitable market opportunities for Honduras. To facilitate the transition from import substitution to export expansion, the Mission has designed, or is in the process of designing, a number of projects which will take advantage of this opportunity. The most significant of these is the previously mentioned Export Development and Services Project (522-0207), scheduled to be presented to AID/W simultaneously with this Project. This project will supply the economic, social and market criteria required to identify new export crops. Through a commodity system approach, the export promotion effort will cover pre-production elements (including

market intelligence) and production elements (including technical assistance to producers). It is expected that the groups (export associations, federations, etc.) with which the project will work will also work closely with the Research Foundation, particularly in providing input into production problems and identifying needed research. Representatives of these groups, such as the Honduran Federation of Agricultural Producers and Exporters (FEDPROEXAH) were members of the Founding General Assembly and are represented on the Foundation's Board of Directors, Oversight Committee and other functions.

Coordination between the two projects will ensure that individual commodity systems are not promoted until an adequate knowledge base is available to assure reasonable prospects of profitable operations, including both market and production factors. This implies that some commodity systems otherwise attractive will not be promoted until the necessary knowledge base is developed. Annex III.I. describes the relationship between the two projects.

The Mission is presently engaged in other projects with research components whose activities will be closely coordinated with those of the Foundation. In addition to the Agricultural Research Project (522-0139) scheduled to end this year, there are currently three CRSP activities operating in Honduras and working on Sorghum/Millet, Bean/Cowpea, and Aquaculture. These activities are described below. In addition, the Pan American Agricultural School at El Zamorano is attempting, through an integrated pest management approach financed through a Mission OPG, to develop improved crop protection practices for small- and medium-sized maize and bean producers. The Mission has just embarked on the implementation of a Small Farmer Livestock Improvement Project (522-0209) which provides relevant experience in the formation of a private agricultural organization with government support and participation. The livestock project will be a natural conduit for technology dissemination of FHIA's future improved pasture program.

A number of Mission projects planned for the near future will complement and strengthen Foundation activities by addressing structural problems identified earlier as inhibiting technology adoption. The Alternative Agricultural Service Delivery Channels project (522-0252) will assist in the provision of credit and other production resources to small farmers who currently have little or no access to these resources. The Mission expects to improve the agricultural marketing system through a new project in FY 85. Likewise, small and medium-scale irrigation will be significantly increased through another Mission project in FY 85 or FY 86.

3. The A.I.D. Science and Technology Bureau Office of Agriculture (S&T/AGR). There are also major research support resources available through A.I.D.'s Science and Technology Bureau. The major number of these are in the S&T Office of Agriculture (S&T/AGR) portfolio. These include all of the International Agricultural Research Centers mentioned previously plus the International Fertilizer Development Center (IFDC), the Asian Vegetable Research and Development Center (AVRDC), the International Board for Plant Genetic Resources (IBPGR), the International Food Policy Research Institute

(IFPRI), and the International Service for National Agricultural Research (ISNAR). Collaborative Research Support Programs (CRSPS) with U.S. Universities are also under S&T/AGR. Two of these that are of interest to the Foundation are already active in Honduras: Beans/Cowpeas (931-1310) and Sorghum/Millet (INTSORMIL) (931-1254). The Beans/Cowpeas and INSORMIL projects have medium- to long-term collaborative programs with the Pan American School at Zamorano and the GOH National Research Organization. Resources from these projects include staff, equipment and other operational costs. Both have suffered from the host country management inefficiencies of the institutions on which they depend for conducting research. The Foundation will be in a position to conduct joint research with these two programs as part of the overall basic grains research program. Thus, these and similar projects may play an important role in strengthening the Research Foundation efforts towards improved production and nutrition. About $675,000 have been allocated by CRSP's in Honduras over the past three years. However, the Soil Management (931-1311) and Peanuts (936-4048) CRSPs would also be able to assist the Foundation on a TDY basis. The Foundation will also be able to access projects sponsored by S&T/AGR that are presently working in Honduras, including those in biotechnology: Symbiotic Nitrogen Fixation (Niftal) (931-0613) and Biotechnology Limiting Factors (931-0610), both of which are concerned with ways to fix nitrogen for plant nutrition in substitution of more expensive chemical fertilizer nitrogen. An additional project in this area in the S&T portfolio is Biotechnology-Plant Tissue Culture (936-4137) for food production under environmentally stressed conditions. This is an area of great interest for the basic grains crops and other crops as well. S&T/AGR projects on Improvement of Post-harvest Grain Systems (931-0786) and in Farming Systems Support (936-4099.01) are already active in Honduras and will provide valuable inputs to the Foundation, as will the International Soybean Research Network (936-4132). At the same time, it should be noted that additional S&T/AGR-sponsored activities not presently implemented in Honduras are of interest to the Foundation and that the possibilities of their participation in the Foundation's activities will be explored during the first six months following Foundation approval. These include the Soil Management Support Services (931-1229), the International Benchmark Sites Network (IBSNAT) (936-4054) and the Technology of Soil Moisture Management (936-4021), all of which will be very important to the Foundation in assuring that experimental sites are well chosen, that they represent important soils in Honduras, and that technology for similar soils outside of Honduras can be transferred in for validation. Likewise, the projects on Water Management Synthesis (II) (936-4127), Integrated Pest Management and Environmental Protection (936-4142), Agricultural Information Exchange System (AGIES) (936-4167), Agricultural Technology Research and Development (936-4109), Crop Nematodes (931-0614), Storage and Processing of Fruits and Vegetables (931-1323), and Rodent and Bird Control (936-4120) and Agricultural Policy Analysis (936-4084) appear to provide knowledge useful to the Foundation. The desirability of their affiliation with the Foundation will be explored during the first 12 months following the initiation of Foundation operations. The approximate annual value of the S&T/AGR-sponsored activities of interest to the Foundation and currently active in Honduras is $500,000. The potential added value for those projects and programs under S&T/AGR that are of definite

interest to the Foundation but not active at present in Honduras is $600,000. Thus, the total yearly potential contribution to the Foundation by S&T/AGR-sponsored projects will approximate $500,000 per year but could increase to $800,000 or more depending on the mutuality of interests and possibilities to perform productive work that need to be negotiated between the Foundation, USAID/Honduras and S&T/Agriculture.

B. Relationship to Other Donor Programs

1. The Food and Agriculture Organization (FAO). When the United Brands Company decided to close down its research facilities in La Lima, it announced that banana breeding would be the first research program to be cut because of its long-term focus. This breeding program is recognized as one of the industry's premier plant breeding activities with an existing germ plasm bank valued at approximately U.S.$10 million. Given the importance of the program and the value of bananas/plantain as export and for local consumption, methods for maintaining the program were sought by the GOH and AID. Fortunately, the United Nations Food and Agricultural Organization made an initial six-month grant of $250,000 in January 1984 to cover operating costs of the program, and has recently extended that grant for an additional six months. In addition, the FAO has agreed to assume major responsibility for recruiting additional support for the program from other donor countries and agencies. The Goverment of Ecuador, a major banana producing country, has demostrated significant interest in participation in the Foundation's banana breeding program. (See letters from FAO representative and the Ecuadorean Ambassador in Honduras, attached as Annex III.J.)

2. The Banana/Plantain Network. The International Development Research Center (IDRC), a Canadian LDC assistance organization, has proposed a tentative format for an international research network dealing with bananas and plantain, an important group of food crops hitherto largely ignored by the international research community. The prime objective of the proposed network is to increase and stabilize the production of bananas and plantain grown throughout the world. This objective would be achieved by:

a. helping national and regional programs establish and implement research priorities,

b. strengthening breeding programs and facilitating the interchange of improved and disease-free genetic material,

c. assisting in the establishment and analysis of regional and global trials of new and improved cultivars,

d. supporting studies on banana-based farming systems and socio-economics associated with the breeding program,

e. promoting the interchange of documentation and information relating to bananas,

f. providing appropriate training for staff of national programs, and

g. identifying donors and assisting countries in the development of proposals for donor support.

The proposed network will have a regional structure and will focus its support on activities conducted by national research systems. The network will have a Governance and Program Committee structure analogous to some CGIAR Centers, (such as ISNAR or IBPGR) but will not have a central research facility. It will, however, expect to utilize the resources of existing breeding programs, including the long-established one at La Lima, in Honduras, now a program of FHIA. Evidence exists to suggest that some germ plasm in this program is resistant to black sigatoka disease. An early goal of the network will be to utilize new tissue culture techniques and hitherto unavailable germ plasm in order to produce and propagate plants resistant to black sigatoka.

It is envisioned that as the Foundation assumes administrative responsibility for the breeding program in La Lima and FAO solicits and receives donations/contributions for the program, it will become a major part of the International Banana/Plantain Research Network.

3. Other Donors Supporting Agricultural Research. Honduras has traditionally been a recipient of international assistance, both financial and technical, from a number of different organizations.

CIMMYT, CIAT and CIP collaborate on a continued basis with research programs in Honduras. Their potential support role, however, is impaired by weak and inconsistent host programs. Nevertheless, these three centers constitute major sources of technical and training assistance for the staple food crops.

CATIE, a regional center for research and training, has been active in Honduras since its inception. It maintains resident staff in the country in support of production research in collaboration with GOH programs. In addition to technical assistance and training, CATIE contributes small amounts of operational funds for project-related activities.

Some U.S. universities' CRSP's are currently engaged in research activities in the country. The Bean/Cowpea and INSORMIL projects have medium- to long-term collaborative programs with the Pan American Agricultural School at Zamorano and the GOH National Research Organization. Resources from these projects include staff, equipment and other operational costs. These and similar projects may play an important role in strengthening the Research Foundation efforts towards improved production and nutrition. About $675,000 have been allocated by CRSP's in Honduras over the past three years.

The IDRC has provided the GOH research program with about $200,000 per year since 1978, in support of farming systems research, in-service training and other expenditures.

The Government of Taiwan has a technical mission in support of rice seed production on the northern coast of Honduras. Its input has been important in establishing an acceptable domestic capability for improved rice seed production. This assistance includes professionals, implements and operational costs amounting to $150,000 annually.

The Government of Japan has recently finished building very modern facilities for a Water and Irrigation Training Center in Comayagua, Honduras, at a cost of $7,000,000. This donation will be the headquarters for research and training in water use and management for research and extension personnel and farmers.

The Swiss Government currently supports a comprehensive rural development program in two impoverished zones near the Salvadoran border (Marcala and Goascoran). Even though research activities are at this point limited to socio-economic baseline studies and some crop production practices, these may be increased as basic infrastructure (schools, roads, water, etc.) is made available. The Swiss contribution to this 10-year program amounts to $13,500,000 in grant funds.

The Inter-American Development Bank (IDB) and the World Bank have provided funds and technical assistance for research/extension over the years. IDB financed (loan) most of the infrastructure of GOH experimental farms in Honduras. This support also included vehicles and other costs. This program is about to end and has disbursed about $3.5 million since 1976.

The World Bank has provided funding (loan) totalling $800,000 toward crop and cattle production research and technical assistance from 1979 to 1984.

The Foundation will carefully coordinate its efforts with these research programs and solicit their technical as well as financial support for its own programs. Several of these donors, including the IDB, have expressed interest in supporting FHIA operations.

V. PROJECT ANALYSES

A. Technical Analysis Summary

1. Research. A detailed analysis of production problems and potential research projects is shown in Annex III.A., Technical Analysis for Research.

The selection of the commodities on which research is to be performed will be undertaken by the Director General with the approval of the Board of Directors and in coordination with agricultural export and other producers. For the non-traditional export crops, close cooperation will also be maintained with the A.I.D. Export Development and Services Project in making these determinations.

a. Crop Identification and Selection

i. Research Criteria. The Foundation will be guided by foresight and flexibility to adapt to changing agricultural needs and opportunities over time. Specific criteria for selecting specific research programs will be developed by the Foundation's Board of Trustees and the Director General, and will include:

Profitability. Profitability will be the overriding concern for the development of Foundation technologies. While often profitability is linked directly to increases in yields, the experience of the last decade throughout the world has demonstrated that this is not always the case. The Foundation will maintain multidisciplinary research teams, including at least one agricultural economist, to ensure that financial return to producers is a key variable in the selection of commodities. Thus, the research program will consider technologies designed to maximize the profitability of production.

Marketability. Adequate markets must be available for crops requiring research investment. Good market intelligence will be necessary to ensure that research commodities are able to penetrate and maintain those markets. This is, of course, particularly critical in non-traditional export crops. Commodities where research is undertaken under contract will have met, to some extent, the marketability question since a producer has already estimated that the investment is warranted and, presumably, a market study will have been undertaken. At any rate, the Foundation will coordinate its efforts with those organizations providing export development services, especially those under the Export Development and Services Project, and particularly FEPROEXAH. Availability of secondary, less demanding markets will also be a marketability factor. The CBI legislation has, of course, created good market possibilities for numerous crops.

Adaptability. Selected crops (and technologies or techniques) must be adaptable to environmental conditions existing in Honduras and within the sphere of influence of the Foundation. On-farm testing of all technologies and techniques will ensure that this is the case.

Macro-economic Considerations. Foundation staff will estimate the benefits of specific crops and programs and the accrual of these benefits to the Honduran economy in crop selection. This will include opportunities to promote crops that are presently imported (such as, for example, soybeans), the labor-intensity of production of a particular crop and its potential impact on rural unemployment (cocoa is particularly labor intensive), and other economic linkages.

b. Identification of Research Problems. Once a crop has been chosen, it will be subjected to further analysis in order to determine the specific problem(s) to be researched. To accomplish this task, the Foundaton will contract the services of one or more top crop specialists for approximately one month. Such specialists should possess extensive experience with the crop in question and be familiar with research problems and efforts

for that crop, in a variety of countries. Depending on the crops and problems, an individual might be contracted or, more likely, an institution will be contracted through the numerous linkages that the Foundation will establish. For non-traditional and traditional export crops, international companies, producing countries, U.S. universities and other institutions such as the USDA will provide this assistance. For basic food crops, it is anticipated that the IARC's will provide the logical linkages as described earlier. In some instances, further problem definition might be required. In such cases, FHIA would contract an in-depth study group to further elaborate the research needs of a specific crop. The T.A. requirements would be for two or three people for a two-month period.

Following the analytical work described above, and based on their determination of the kind of research needed, the consultant(s) will estimate the numbers and types of personnel required, including a list of candidates for the senior scientist position(s).

c. Research Methodology

i. Team Research. Research will be commodity-based and carried out by teams of scientists and technicians, the composition of which will be adapted to the needs identified during the problem analysis. All aspects of crop production will be considered, including nutrition, weed control, disease and insect control, cultural practices and post-harvest problems.

The success of the team approach will depend in large part on the input of highly qualified senior research personnel who can provide the necessary leadership to the team. For this reason, FHIA will recruit worldwide for senior scientists and offer competitive salaries.

ii. Basic and Adaptive Research. Research often turns out to be neither clearly basic nor clearly adaptive and the Foundation will do a combination of the two, in varying degrees, based on the research problems identified during the initial analytical stage.

Activities more adaptive in nature might include the determination of whether a new variety or cultural practice is suitable to local conditions, or the development of agricultural practices (such as weed control, disease and insect control, irrigation and fertilizer use) calculated to reduce crop loss and obtain optimum economic yields.

The solution of more complex problems will require more in-depth research. Studies of root development under certain types of culture or soil conditions, and other studies in plant physiology, are examples of more basic research to be undertaken by the Foundation.

iii. On-Farm Testing. The work of the researcher is finished only when his product has been tested on-farm and is being used by farmers to increase economic production and productivity. There are innumerable techniques and combinations of trials which may be used to obtain

desired results. Each research team will devise a system which fits its commodity and circumstances in order to reach its objectives. Through the assistance of the Foundation's Communications and Outreach program, information from farmers and cooperating extension agents will be recycled through the research program and will be highly valuable in reorientation of research (see Technical Analysis for Dissemination).

iv. Crop Monitoring. Once research results have been tested and accepted, the Foundation will refocus its research approach. It will be important to monitor the crop for additional problems, or the adaptation of new research information. However, the full research team may not be required, and some personnel can be assigned to new projects.

d. Legal Status of Research Findings. In accordance with its by-laws, research conducted by FHIA will not be conducted on a proprietary basis. FHIA will guarantee that the findings of contracted research are disclosed promptly and on a priority basis to the contracting group or firm. Findings, however, will eventually be available to all Honduran and international producers. An important question during Project design was the extent to which such a policy might provide a disincentive for the contracting of specific research programs. An intensive review of experiences to date with proprietary research (including patents) and discussion with international and Honduran private sector groups demonstrated that an open-ended policy would not inhibit contracting for research.

Experience worldwide on agricultural research, particularly biological research, has demonstrated the limited usefulness of patents or other means to prevent the gratis adoption of technologies by others. This has been the experience of United Brands, for example, in patented post-harvest technologies which theoretically should be easier to protect legally. Moreover, maintaining exclusive rights to technology is usually not the objective of the producer. Rather, it is obtaining the technology within the shortest time frame possible to meet constraints. It is recognized that there will be benefits downstream to those that did not contribute to technology development. For the producer requiring immediate solutions to production problems, this is inconsequential. For FHIA, it will be a positive contribution to the development of Honduran agriculture.

e. Linkages To Available Research. One of the unique aspects of the Foundation will be its ability to establish and maintain linkages with pertinent research efforts in other countries, and thereby expand the overall research capacity of Honduras. Although important for a variety of crops, this approach will be particularly important in the basic food crops program.

The MNR has primary responsibility for research in the basic food crops. However, because of the internal financial and administrative difficulties described in earlier sections of this paper, the MNR has not been able to mount successful long-term improvement programs. Because of the autonomy and administrative flexibility of the Foundation, it will be in a position to

assist the MNR in establishing and sustaining long-range research programs in collaboration with pertinent regional and international centers such as CIAT, CIMMYT, CATIE, ICRISAT, IICA, and CIP.

The mechanisim will be collaborative research agreements for specific crops between the MNR, the Foundation, and the designated research center. GOH funds in support of these agreements will finance their operation. It is understood that outside financing for the collaborative research programs must be provided since none of the centers have funds for this purpose. However, this approach will prove to be cost-effective for Honduras. For example, the full value of the CIAT research programs in beans, rice, cassava, and tropical forages and pastures, costing more than $25 million annually, can be made available to Honduras for an estimated cost of $300,000 per year. Under such an agreement, the collaborating institution will establish crop-specific outreach programs in Honduras, under the auspices of the Foundation. An outreach program would consist of at least one principal staff member from the collaborating center, stationed at the Foundation, plus the movement of other research specialists between the centers and the Foundation as specific needs arise. The research teams will be augmented by assistants and associates of the Foundation and the MNR research unit. The on-the-job training received by these individuals will be an invaluable asset for the country, in addition to assuring continuity in research. Additionally, the importation of equipment and supplies, and the export and import of seed, will be greatly facilitated through the Foundation system because of duty-free importation status granted by the GOH.

The feasibility of collaborative research with the IARC's has been tested in other countries. Each of the centers has elaborate research networks in a great number of countries. CIMMYT has two groups stationed in Ecuador, working on wheat and corn; ICRISAT has scientists stationed in Brazil, through INIAP, working on cowpeas, chickpeas, and pidgeon peas. CIAT is working in Costa Rica, under the auspices of IICA, and also has research personnel stationed in Africa and the Far East.

2. Dissemination Channels for Research. The potential for dissemination of agricultural information to Honduran farmers through existing institutions and organizations is high. Private sector companies engaged in the distribution of agro-chemicals and in purchasing and/or processing of farmers' production, farmer and producer organizations, cooperatives, and private voluntary organizations (PVO's) all have personnel in the field and present a tremendous potential dissemination system for getting relevant information to farmers. Public institutions, such as the National Extension Service of the MNR, various other public sector agencies such as the National Agricultural Development Bank (BANADESA) and the INA also have active extension programs and activities which provide potential for reaching certain audiences with technologies. Brief summaries of the present status of the organizations which make up the dissemination system are presented below.

a. Private Sector. As in many other countries, the most effective extension systems in Honduras have been those organized by the private sector, including multinationals, national firms, cooperatives and producer organizations, and private voluntary organizations (PVOs). The private sector will be the primary extension agent in dissemination of non-traditional crop research. As in other aspects of the Project, FHIA will work closely with those producer organizations which will be receiving assistance from the Export Development and Services Project, particularly in extension.

FHIA will work closely with FEPROEXAH and its member institutions in disseminating research findings. Present member associations and their Spanish acronyms are:

- Honduran National Citrus Growers' Association (ANACIHO)
- Honduran Coffee Producers' Association (APROHCAFE)
- Cocoa Producers' Association (APROCACAO)
- Sula Cattlemen and Farmers' Association (AGAS)
- Honduran National Poultry Producers' Association (ANAVI)
- National Swine Producers' Association (ANAPOH)
- National Beekeepers' Association (ANAPIH)
- Honduran Association of Independent Sugar Producers (AHCI)
- National Vegetable and Flower Growers' Association (AHFAH)
- National Independent Banana Producers' Association (ANBI)
- National Independent Tobacco Growers' Association (APROTAVIDI)

As described in detail in the Export Development and Services Project Paper, FEPROEXAH (through A.I.D. financing under that Project) will contract the services of a commodity productivity advisor and a limited number of extension agents for cocoa, citrus, and winter vegetable production and provide them with logistical support. FHIA will work closely and consult with this staff to ensure proper dissemination. While many of these producer organizations are in a nascent stage, A.I.D.'s technical assistance efforts through FEPROEXAH will enable these organizations to develop their capability to provide a full range of services to their members, including extension services. Working through these producer organizations, FHIA will establish good conduits for technology dissemination. The international private sector will also participate in extension and technical assistance efforts. The cocoa commodity expert and extension agents, for example, will be chosen in coordination with the Hershey Corporation, while Griffin and Brands will likely play a similar role for citrus extension and technical assistance.

USAID/Honduras' experience has demonstrated the viability of carrying out non-public research programs. The Mejores Alimentos program under the current research project is one example described earlier. Cooperatives and campesino

federations are another practical and proven means of reaching the target group, as the successful efforts to promote export-oriented agriculture at Fruta del Sol and CREHSUL cooperatives have demonstrated. The Foundation will carry out outreach programs and actively work with these groups. PVO's also represent a significant vehicle for dissemination of agricultural information to rural families. More than 30 PVO's with agricultural or agriculturally-related projects are active in Honduras but in many cases are underutilized as dissemination channels by Honduran research and extension institutions. Most are active at the village level and have extensive contact with small and medium-sized farmers, and some maintain their own extension support services. Although not all their programs are agricultural, those focused on the village and rural development provide ready conduits for the dissemination of agricultural information or collection of feedback concerning the needs, aspirations and reactions of small and medium-sized farmers. Perhaps the best example of how PVOs can be used effectively in Honduras is the Rural Technologies Project (522-0157) where the increased emphasis on PVO's as dissemination agents during the last two years has significantly increased the project's outreach capacity in all areas of the country.

b. Ministry of Natural Resources (MNR). The MNR extension program is carried out through seven regional Directorates and local extension agencies. Two additional regional directorates to be established in the near future will complete at least nominal coverage of the country. In all, there are approximately 100 extension agencies in the country manned by about 240 extension agents. This is an inadequate number of agents to provide effective extension service to all farmers and rural families of Honduras if only conventional extension methods are used. The problem is exacerbated by insufficient vehicles, inadequate operating funds and lack of career opportunities.

Despite its notable weaknesses - and the recognition that technology dissemination should not depend on its performance - the MNR system has had its share of successes and should not be discounted in dissemination efforts, specifically those geared to basic food production. Given the likelihood of continued budget constraints, the challenge for the GOH, A.I.D. and the FHIA is to strengthen the present system within the framework of available resources. In this regard, there are at least three areas in which FHIA can provide valuable assistance: improving current non-traditional dissemination efforts, assisting in the development of outreach materials for distribution to producers, and through selected training of extensionists in appropriate technologies.

MNR has initiated several efforts at non-traditional dissemination channels, including mass media. An MNR Communications Unit was recently created to upgrade these programs. Communications units have been established in each region, in addition to the central unit in Tegucigalpa. A major activity of the regional units has been production of weekly agricultural radio programs broadcast over local radio stations, which appear to have had some success but which can clearly be improved. FHIA's Communications Directorate will play an important role in improving these programs, resulting in greatly improved

outreach. In this regard, FHIA will work closely with the S&T Bureau, which is currently developing a FY 85 project on Agricultural Communications to develop and demonstrate more effective ways to use mass media and communications methods to support technology development and transfer in agriculture. Honduras has been selected as one of the primary sites for the S&T project, which provides an opportunity to bridge research and extension communication activities, and provides an additional level of technical assistance and evaluation, particularly in regard to MNR activity not funded under the Agricultural Research Foundation Project. The S&T project will also be a facilitator for the integration of Foundation activities with related national research and extension activities. FHIA's Communications and Development Directorate will also work with selected MNR extensionists, providing them with instruction on the dissemination of adapted technologies. As in many countries, the linkages between research and extension have been weak in Honduras, resulting in extensionists going to the field with recommendations which are not always appropriate (standard or "packaged" recommendations for fertilizer use is one example). An important objective of FHIA will be to work with MNR's research and extension systems to improve the linkages between research and extension.

c. Other Public Sector Institutions. A number of other institutuions in the public agricultural sector have programs - some, such as IHCAFE, quite effective - that disseminate information to farmers as a part of their overall program activities, including:

- National Agricultural Development Bank (BANADESA)
- Honduran Institute of Agricultural Marketing (IHMA)
- National Agrarian Reform Institute (INA)
- Honduran Coffee Institute (IHCAFE)
- Directorate of Cooperative Development (DIFOCOOP)

The high degree of interest expressed by representatives of such public sector entities during an Agricultural Communications Seminar, sponsored by USAID/H and the GOH in Tegucigalpa in April 1983, indicates significant potential for incorporating them into the system for dissemination of information generated by FHIA.

The basic elements of an agricultural information dissemination system exist. It is reasonable to expect that the system can become much more effective in disseminating the new or improved technology and practices generated by the Research Foundation to Honduran farmers and organizations.

FHIA, through the Communications and Development Directorate, will be able to coordinate and work directly with all the institutions listed above and create an effective and viable communications network which will facilitate the rapid flow to producers of information resulting from the Foundation's research programs.

B. Administrative Feasibility

In designing the organizational structure and administrative processes of the new Foundation, careful consideration was given to lessons learned in previous research projects in Honduras and other developing counries. The constraints to effective agricultural research are discussed in the Background section of this paper and ways to overcome those bottlenecks are reflected in the strategy and approach of this Project.

To determine the administrative feasibility of the new Foundation, several key questions were asked:

1. Will the proposed organizational structure be responsive to the variety of needs and actors in the Honduran agricultural sector?

2. Can the high rates of attrition of skilled staff, commonly found in research projects, be avoided?

3. Can an equilibrium be maintained between members of staff and level of program operation?

4. Is the concern for financial viability adequately addressed for organizational and administrative design?

1. Responsiveness of Organizational Structure. A high degree of responsiveness to the many needs and actors of the Honduran agricultural sector is planned for at several levels of the Foundation's structure.* It is amply reflected in the makeup of the founding members. They represent the private sector, campesino groups, producer associations, agricultural educational institutions, the GOH, A.I.D. and FAO, and the international scientific community. Together they constitute the overall governance of the Foundation, playing a significant role in setting research priorities and guiding the institutional development of the Foundation.

As the need arises, external advisory committees will be established for specific research projects and other activities such as development and fund raising. In addition to the representatives of the governing body, participation will be sought from other important groups and cooperating institutions such as the IARC's, other national research entities such as IHCAFE, PVO's, and agricultural trader/broker companies. This mechanism is intended to ensure that the research initiated is relevant to stated needs, as well as to facilitate communication among the many different groups that influence the success of a research program.

*See organizational charts contained in Annex III.C., Administrative Analysis.

Responsibility for ensuring responsiveness on the operational level rests with the Communications and Development Directorate, which is composed of four functional units: Communications (and outreach), Training, Library and Information Services, and Development and Public Relations. The outreach and training units will be central in coordinating the information flow between researchers and farmers users through the various dissemination channels described in section IV.A. Additionally, this Directorate is responsible for systematizing research information through the library and computerized data bank for internal use as well as communication with other research institutions and user groups.

2. Ability to Keep Skilled Staff. Several factors will influence the Foundation's ability to keep skilled staff: (a) extensive recruitment to identify the best possible candidates, (b) competitive salaries and benefits, (c) training which is commensurate with available jobs, and (d) opportunity for advancement within the organization.

Each of the factors has been considered and is discussed in Annex F. It is the intention of the Foundation's Board of Directors to recruit world wide for the top management and senior scientist positions. The recommended salary scale is adapted from those currently in operation in several international organizations and is presented in Table II of Annex F. Salaries for lower operational levels (clerks, laborers, etc.) will be commensurate with those normally paid in the region and as established by Honduran law.

Benefits for the personnel will include those normally adopted by international agricultural research centers, including health care for medical and hospitalization expenses, life insurance plan, long-term disability, retirement plan, vacations, and others that the Board of Directors and the labor laws of Honduras establish. Some allowances will be granted for expatriate personnel in the form of home leave, moving expenses, and housing when justified. Specialized technical assistance in employee policies, procedures, benefits, etc., will develop a personnel handbook which will reflect employee relation objectives, and procedures which will assure uniformity in their administration.

An important aspect to the salary scale is that it offers incentives to research personnel. Scientists can be rewarded for their professional merits without being promoted into administrative positions. An outstanding scientist may reach the salary equivalent of a sub-director and remain full time in research. This incentive is intended to keep the best research people on a continuous, long-term basis.

Whereas this Project does not emphasize long-term training as a major Project component, it is committed to improving the human resource base for agricultural research. It is anticipated that initially many of the research associates and assistants will be young Hondurans committed to agricultural research as a career. On-the-job experience will provide a solid training ground for them. Additionally, the most promising of these young researchers will have opportuninities for further academic and non-academic training abroad, at other research centers and universities. The duration and type of training offered will be in line with the Foundation's research agenda and availability of jobs for the returning trainee.

3. Level of Operations. An operational principle of the Foundation will be to expand its program operations as funds become available. The organizational charts in Annex F show anticipated staffing both for initial operations and full operation. It is expected to take five years to reach the full level of operation.

The organization is structured in such a manner that each office can expand in a modular fashion. From the initial base, research, communication and support staff will increase only as commodities are selected by the Director General and the Board of Directors. No commodity will be approved until the source of funding has been identified and commitments made.

Accurate accounting and budgetary planning will be essential and nine person-months of technical assistance in this area is in the project design. Because of the commodity-based approach in the research program, scientific and support personnel requirements can be determined following the initial in-depth study of the crop in question (see research methodology in the Technical Analysis).

4. Financial Viability. In order to sustain its operations over the long term, the Foundation will engage in a structured and permanent organizational development (fund raising) process. Organizational development is viewed as an integral part of the institution's operations. For this reason, operational responsibility for this task has been strategically placed within the Communications Unit, forming the Communications and Development Directorate. Generally, the normal organizational pattern separates these functions, with resulting confusion as to who interprets what information to whom; who is responsible for which levels of cultivation, public and private; and who coordinates the functions and events vital to institutional exposure and friend-making. The proposed model seeks a more effective structure and a more efficient use of key personnel. It is intended to foster consistent two-way intercourse between the emerging Foundation and its supportive publics.

The first point covered in this analysis discussed the organization's ability to respond to the needs of its clients and the Communications and Development Directorate was shown as playing a key role in that process. However, clients and sponsors are not easily separated into two distinct groupings. In many cases, they are the same. In other cases, sponsors will have a vested interest in improved agricultural productivity even if they are not the end users of research results. Annex III.E., Institutional Development and Demand for Foundation Services, identifies and discusses eight target groups for the Foundation's development campaign:

a. Honduran agricultural federations, associations and cooperatives;
b. Honduran corporate and financial sectors;
c. Honduran and U.S.-based private and voluntary organizations;
d. The Government of Honduras, including the Ministry of Natural Resources, INA and the Ministry of Education;
e. International agricultural research centers and regional agricultural centers;

f. U.S. based corporate and financial sectors (including trading companies and brokers);
g. U.S. private sector - foundations and private citizens; and
h. U.S. and international development agenies (UN/FAO, USAID, IBRD, IDB, EEC).

An initial demand analysis was conducted during Project development. Representatives from the eight target groups were interviewed to glean the level of interest in the work of the Foundation. The analysis also formed the basis for defining steps the Foundation can take in facilitating a successful organizational development and fund raising process.* What is clear is that development is a lengthy process, with distinct stages:

- building client/sponsor awareness of the Foundation's goals, objectives, programs and services;

- developing strong interest in the work of the Foundation;

- initiating negotiations in areas of mutual interest; and

- acquiring a commitment of resources from the client/sponsor.

For any one sponsor, this process may take three to five years for completion, and the Foundation is planning for this timing by using the A.I.D. grant in a less-than-LOP disbursement schedule and an initial FY 1984 and 1985 local currency infusion of $3.0 million, as demonstrated in the Financial Plan.

Because of the uniqueness of the development process, technical assistance will be provided to work closely with the Communications and Development Directorate, the Director General, and the Board of Directors. Assistance will be in defining strategy, establishing systems of information, collection and record keeping, and training the Board and executive staff for interpreting and selling the Foundation and its programs to a diverse client/donor public.

C. Financial Analysis

1. Project Funding. The total cost of the Project is $33.0 million over a ten-year implementation period, which will firmly establish and make operational an independent, private research Foundation which will expand and improve Honduras' agricultural research system. A.I.D. will contribute $20.0 in grant funds while the GOH counterpart contribution will be $6.0 million. The private sector and other donors will contribute $7.0 million. In addition, FHIA will provide existing facilities and equipment estimated at $1.8 million. Annex III.G. provides a detailed breakdown of Project costs by year of implementation. Table 1 below presents a breakdown of A.I.D., GOH, and other donor/private sector contributions.

*A summary of interviews and a description of next steps are contained in Annex III.E.

Table 1
Honduran Agricultural Research Foundation
Financial Plan
(U.S. $ 000)

Investment Categories	AID FX	AID LC	GOH FX	GOH LC	Other Donors/ Private Sector FX	Other Donors/ Private Sector LC	Total Costs
Administrative Operating Costs							9,190
I A. Salaries, benefits/allow.	3,000	1,510	-	-	500	680	5,690
B. Travel & Per Diem (including Board of Directors)	500	205	-	-	-	-	705
C. Operating Expenses	250	500	-	1,175	-	-	1,925
D. Professional Services	50	170	-	-	-	-	220
F. Technical Assistance	650	-	-	-	-	-	650
II Capital Investments							3,120
A. Vehicles & Maint. Equip.	215	-	-	-	210	-	425
B. Office Equipment	20	45	-	-	20	45	130
C. Radio Equipment	25	-	-	-	25	-	50
D. Data Processing & Software	25	-	-	-	25	-	50
E. Communication Equipment	130	-		-	150	-	280
F. La Lima Facility Improvemt.	-	-	-	385	-	-	385
G. Agricultural Equipment	200	-	-	-	-	-	200
H. Land	-	-	-	1,000	-	-	1,000
I. Laboratory Equipment	400	-	-	-	200	-	600
III Experimental Substations							370
A. Infrastructure	-	-	-	150	-	-	150
B. Equipment	220	-	-	-	-	-	220
IV Research Programs							
A. Non-traditional Crops							7,890
1. Citrus	745	220	-	-	90	750	1,835
2. Cocoa	400	400	-	-	90	900	1,790
3. Vegetables	300	905	-	-	90	1,000	2,295
4. Other Non-traditional Crops	500	-	-	-	100	1,370	1,970
B. Basic Food Crops							3,130
1. Corn and Sorghum	700	-	-	905	-	475	2,080
2. Beans	500	-	-	550	-	-	1,050
C. Traditional Export Crops							1,025
1. Coffee	-	-	-	400	-	-	400
2. Pastures and Forages	-	-	-	375	-	250	625
3. Banana/Plantain Program	-	-	-	-	(5,000)	(2,912)	(7,912)
D. Central Exp. Farm Personnel	-	650	-	40	-	-	690
E. Constr. Nursery Warehouses	-	120	-	120	-	-	240
V Communications and Development							
A. Salaries, Travel, Transp.	1,170	-	-	880	-	-	3,690
B. Equipment Maintenance	-	-	-	20	-	-	20
C. Training	300	255	-	-	-	-	555
D. Technical Assistance	1,065	-	-	-	-	-	1,065
VI Technical Analytical Services	80	1,920	-	-	-	-	2,700
VII Evaluation	175	25	-	-	-	-	200
VIII Project Liaison Officer	300	75	-	-	-	-	375
IX Contingency	380	-	-	-	-	-	380
Sub-total	13,000	7,000	-	6,000	1,500	5,500	33,000
Grand Total	20,000		6,000		7,000		

AID and GOH funds will finance the core budget necessary to establish the Foundation and to begin core research programs. Contributions from other donors and the private sector (including the contracting of specific research tasks for the latter) will support the expansion of research programs, as well as some infrastructure and operating expenses in the out-years after the Foundation is established. Contributions from other donors and the private sector will also finance the banana and plantain program.

AID funds will specifically finance administrative and other operating costs; initial capital investments including vehicles, laboratory, agricultural, data processing, audiovisual and other equipment; the initial phase of the non-traditional crop research program and dollar financing of the basic foods program and the Communications and Development Directorate; evaluations; contingency; technical assistance for research, Communications and Development (including fund raising), administration and financial matters, and a Project Liaison Officer to assist the Mission and FHIA in implementation in its first three years of operation. Table 2 below, Cash Flow Analysis, also includes a disbursement schedule for AID and GOH funds and expected contributions from the private sector and other donors.

The GOH will contribute agricultural land to carry out research, initial infrastructure and other investments, and local currency financing of the basic foods, traditional crop research and other Foundation programs.

The private sector (both national and international) and other donors will support the Project through donations, contributions, grants, and specific research contracts which will fund the expansion of research programs (particularly for non-traditional crops) and some equipment during the latter phase of the Project, as well as specialized personnel and operations/administration.

2. Counterpart Contributions to the Project. The Mission estimates that the recipient country's contribution to this Project will be $13,000,000, equal to 39 percent of total Project costs over the period of active AID participation (including $6.0 million from the GOH and $7.0 million from FHIA recruitment of private sector and other donor support). In addition to this counterpart support, FHIA is contributing the complete and exclusive use of its facilities as Project counterpart. Toward that end, the Interim Director commissioned a thorough value assessment of the facilities, including all land, building and equipment. That assessment, which is available in USAID/H and summarized in Annex III.K., places a book value of $1.8 million on the land and facilities.* In addition, the Director General and the Board of

* This includes only land, buildings and equipment. It does not include banana and plantain germ plasm. Given the difficulty of assessing a value on germ plasm developed after nearly two decades of research, it has not been included. United Brands has assessed its contribution to FHIA, including germ plasm, at $20.0 million.

Directors will be, from the outset, actively recruiting and soliciting donations, contributions, grants, etc., from other donor agencies and Honduran and international private sector concerns. These funds, with the exception of those designated for direct support to the banana research program and those for contracted research, will be made available by the Foundation as part of the counterpart requirement. Project evaluations will be conducted in 1986 and 1988 to assess the success of the Foundation in reaching counterpart requirements. The evaluations will also include recommendations for assuring that the Foundation will be capable of reaching the required level of funding.

3. Financial Analysis of the Foundation. Table 2 demonstrates the financial viability of the Foundation.

Table 2
Honduran Agricultural Research Foundation
Project Cash Flows
($000)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	TOTAL
SOURCES											
1. Sales of Tech./Lab. Services	25	200	320	330	350	375	450	500	535	570	3,655
Capital Resources											
1. AID Grants	230	2,500	2,500	2,500	2,000	2,000	2,000	2,000	2,000	2,270	20,000
2. GOH Contributions											
a. budget allocations	100	200	225	250	290	315	350	400	440	500	3,070
b. local currency(ESF/PL480)	500	2,000	500								3,000
3. Private Sector/Other Donors		100	250	300	500	700	1,000	1,500	1,550	1,700	7,600
Total Sources	855	5,000	3,795	3,380	3,140	3,390	3,800	4,400	4,525	5,040	37,325
Uses											
1. Administrative/Operating Costs	366	1,084	1,174	937	855	893	955	1,024	1,100	1,180	9,568
2. Capital Investments	500	1,869		75		213	296	90	75		3,118
3. Experimental Substations				144		144				80	368
4. Research Programs (not including banana/plantain)		922	1,078	1,030	967	1,568	1,889	1,744	1,863	1,917	12,978
5. Communications & Development		676	664	453	277	292	307	322	339	358	3,688
6. Technical Analytical Services	359	317	243	257	272	287	304	321	359	2,699	
Sub-Total	866	4,910	3,233	2,882	2,356	3,382	3,734	3,484	3,698	3,874	32,419
7. Evaluation			25		75					100	200
8. Contingencies		78	78	75	75	75					381
Total Uses	866	4,988	3,336	2,957	2,506	3,457	3,734	3,484	3,698	3,974	33,000
Cash Flow	(11)	12	459	423	634	(67)	66	916	827	1,066	4,325
Cumulative Cash Flow	(11)	1	460	883	1,517	1,450	1,516	2,432	3,259	4,325	

62

It is expected that the sale of technical laboratory testing services will continue to generate present income levels of approximately $200,000 per year (in fact, this figure could be considerably underestimated since United Brands was generating $300,000 annually several years ago, and increased production of non-traditional export crops is expected to significantly increase the demand for testing services). Increasing by 12 percent per year, these services will generate over $4.0 million during the life of the Project. It is important to emphasize that this estimate is based on past levels of performance. The GOH has agreed to contribute $200,000 annually (increasing by approximately 12 percent per year). In addition, the Government will contribute $3.5 million in ESF and/or PL 480-generated local currency to support initial infrastructure, land and other investments. This initial GOH contribution will permit AID to maintain a steady disbursement schedule of about $2.0-2.5 million per year during the life of the Project.

Contributions from other donors and the private sector will begin in 1984 and increase progressively during the implementation period. The professional organizational development/fund raising efforts that FHIA will undertake to generate the necessary interest and articulate FHIA objectives and programs have been described above.

In addition to the importance that this activity will be given, FHIA's emphasis on non-traditional export crops provides a means to generate additional revenues. Except for the work carried out by private companies, international and national research efforts have been geared toward basic food crop production. Since in most cases this research has been aimed at enhancing the productivity of small-scale, limited-resource farmers, it has not been possible for research programs to recapture part of these benefits for investment in research (except of course through taxes on consumers - indirect beneficiaries - in order to finance public sector efforts). With export crops, it is easier to capture part of these benefits (as discussed below).

Private firms and producer groups benefitting from research efforts on a relatively small number of export crops present a more defined beneficiary group receiving tangible benefits. Their interest in supporting an adequate technological base for their production is clearer, and contracting and other financial support for research efforts geared to their production needs are likely. Direct contributions from export crop beneficiaries would permit FHIA to directly recuperate a small part of the benefits of its research effort and permit it to reinvest these contributions in its research program. Contracting for specific research is one mechanism which will generate revenues to finance research programs. Another that has been explored during Project design is a small tax per box (or other appropriate quantity) on export commodities which FHIA is supporting through research and whose revenues the GOH would agree to invest in the Foundation. Bananas, citrus, vegetables and cocoa would, of course, be the most obvious candidates. However, the timing for this mechanism is not presently appropriate. With regard to bananas, the state of the industry does not augur for an additional tax. In fact, such a tax to enhance its own revenues was recently rejected by

the GOH after lengthy review. With respect to non-traditional exports, a tax at this time would be contradictory to GOH and AID efforts to create additional incentives in this area. It would in fact be a disincentive and counterproductive to FHIA, AID and GOH objectives.

While such a tax is not a viable alternative at this time, the establishment of a revenue-generating mechanism of this type will be examined when the timing is right. This essentially means in approximately four to five years when the payoffs from the research program are expected to begin in earnest, when exports are expanded, and when producer groups being assisted through the Export Development and Services Project will be in a stronger position. Experience in Honduras and elsewhere has demonstrated that this type of mechanism will work, and will be supported, when the benefits to those that will contribute are demonstrated. Analysis undertaken for the Export Development and Services Project indicates that by 1990, exports of the initial commodity systems (citrus, winter vegetables and cocoa) will be in the $15 million per year range, highlighting the potential for FHIA to tap these benefits. Discussions with institutions and individuals who are likely to participate in the commodity programs have indicated their willingness to support a levy mechanism (instead of a government tax) whereby a fixed percentage of export revenues would be donated to FHIA. This mechanism will be administered by FEPROEXAH. This accord will be outlined in an agreement to be signed between FHIA and FEPROEXAH prior to the initiation of research in non-traditional export crops. Mission discussions during Project design with the Honduran and international private sector and other likely direct beneficiaries have also amply demonstrated their interest in supporting FHIA and have resulted in several funding commitments (see Annex III.J.,) Expressions of Interest.

The previous description of other donor research activities in Honduras demonstrates the interest of these bilateral and international donors in this area. Given the rather limited results in research to date, there is ample reason to believe, as USAID conversations with bilateral and international donors have verified, that support from them will be forthcoming.

By the end of the AID funding period, FHIA will be a fully institutionalized, financially viable research center. Projected positive cumulative cash flows and income generated from the sale of its services will have secured core administrative expenses, while effectively functioning research programs and a proven track record will permit it to obtain the continued support of the GOH and other donors for recurrent costs and expansion of research programs.

D. Economic Analysis Summary

The capacity to develop and manage technology in a manner consistent with a nation's physical and cultural environment is the single most important factor accounting for differences in agricultural productivity among countries.*

* Ruttan, V.W., Agricultural Research Policy, University of Minnesota Press, Minneapolis, 1982.

That capacity, in turn, is dependent in part on the existence of well-functioning institutions to generate and transmit agricultural research results to farmers. Numerous studies have examined the impacts of agricultural research, extension, and education on productivity and output growth for a wide range of commodities and countries. The vast majority have indicated high rates of return to public investment in agricultural research, typically 30-100 percent.

Historically, publicly supported agricultural research in Honduras has lagged far behind the rest of the world in terms of its growth rate of research expenditures as a percent of agricultural gross domestic product. A survey of 41 less developed countries showed Honduras to be one of only four countries with negative growth rates in scientific staff (-1.82 percent) during the 1970's.* The country also had the lowest level of expenditures on public agricultural research as a percentage of agricultural gross domestic product (0.16 percent) of all 41 countries. As a result, production of major food commodities, particularly corn, soybeans, beans and plantain, have stagnated since 1970. Honduras has moved from a net corn exporter to a point where it can no longer meet domestic demand. While food production has stagnated, population has grown at an annual rate in excess of 3 percent. Consequently, per capita food production has declined over 10 percent during the past decade, and an estimated 70 percent of the population is suffering from some form of malnutrition. The situation is compounded by the recent weakness in the banana market which, along with other factors, has reduced the foreign exchange available to import food. The rate of growth in demand for food is likely to be more than 4 percent per year over the next few years. This indicates the extreme importance of increasing basic food production as well as developing exports to generate stable foreign exchange earnings to meet food import requirements.

Private research efforts in Honduras have been substantial in the past. Fruit company research investments have been responsible for the development of bananas as the country's primary agricultural enterprise and foreign exchange earner, and laid the groundwork for the oil palm, pineapple and citrus industries. Private firms do not have incentives, however, to undertake sufficient research because they cannot maintain proprietary rights to the research information produced. It is asserted that this was one factor influencing United Brands to reduce its research efforts in bananas.

Without increases in agricultural production, substantial upward pressure would be exerted on food prices. It is the lowest income groups that spend the highest proportion of their income on food and experience the highest rates of unemployment. Consequently, these would be the hardest hit.

---

* Oram, P.A. and Bindlish, V., Resource Allocations to National Agricultural Research, Trends in the 1970's, ISNAR, IFPRI, 1981.

An evaluation of projected impacts of research undertaken by the Honduran Agricultural Research Foundation must attempt to answer three questions: (1) What are the chances of producing new knowledge or technologies if resources are allocated to particular commodities or problem areas, (2) What will be the demand for that knowledge or technology, and (3) What would be the value to society of that knowledge or technology? Scientists knowledgeable about the different areas of research must help answer the first question while economic theory and methods must be brought to bear on the second. The second also requires knowledge of the socio-economic characteristics of Honduran farmers as well as credit, pricing, exchange rate, and other public policies in Honduras, and the strength of foreign markets for particular commodities. The third question also requires the specification of criteria against which the evaluation will be made; for example, income and employment generation for different groups, nutritional impacts, foreign exchange generation, etc.

Answers to questions posed to scientists and other persons knowledgeable about Honduran agriculture are combined with economic theory and methods to quantitatively and qualitatively estimate the level and distribution of benefits to Foundation research. For the quantitative analysis, a single commodity is examined for each of the three commodity groups: traditional export crops, non-traditional export crops, and basic grains. Individual commodities chosen are bananas, citrus, and corn. The impacts on basic grains as a group are also projected. The results of this analysis are crude at best because the results of research are inherently uncertain and because price responsiveness and the timing and spread of new technologies are difficult to assess. Nonetheless, estimated net economic gains in the aggregate and for producers and consumers are provided below. Rates of return to Foundation research expenditures are projected and qualitative assessments of impacts on employment, improvements in product quality, nutrition, industrial development and foreign exchange are made. Details of the analysis are presented in Annex III.D.

The net present value of economic gains evaluated with a 12 percent discount rate are projected to be $8.3 million for citrus, $24.0 million for bananas, $8.4 million for corn, and $10.9 million for basic grains. These returns are significantly affected by assumed differences in adoption rate for new technologies. These differences are due to the types and locations of farmers producing the commodities. While citrus and banana producers are highly oriented to the commercial sector, most corn and other basic grains are produced on small subsistence farms in the mountains. For the latter group, the availability of credit is limited and the extension service reaches relatively few.

Consumers are projected to receive 17 percent of the economic gains in citrus, 33 percent in bananas, 76 percent in corn, and 72 percent in basic grains as a group. These distributional differences are due to differences in price responsiveness to shifts in production. To the extent that Honduras becomes an importer of corn and other basic grains, price responsiveness will be reduced and a larger portion of the benefits will shift to producers.

Conservative estimates of internal rates of return (IRR) calculated for citrus, bananas, corn, and basic grains are 34.4 percent, 21.9 percent, 45.3 percent, and 81.8 percent, respectively. These returns are well within the range of those estimated in other studies of returns to research. It is important to emphasize that these rates of return are likely to be underestimates because they do not consider the role played by the Foundation in maintaining current levels of production. Even if no yield increases are realized, but current production is stopped from declining as insects and diseases evolve and are introduced from other countries, the Foundation will have a positive economic impact. These rates of return indicate a tremendous opportunity available in Honduras for economic gains due to agricultural research.

A number of other distributional factors should be considered. Honduran basic grain producers consume a large portion of their production (40 percent of corn and beans, 60 percent of sorghum, and 15 percent of rice) and therefore benefit as consumers as well as producers. U.S. consumers benefit from increased supplies of bananas and citrus at lower prices. The urban poor are major beneficiaries of basic grains research while smaller farmers at higher elevations are less likely to adopt the research results than large farmers in the lowlands and will not benefit from research unless improvements are made in the extension service. Part of the producers' benefits will accrue to foreign-owned companies, but export taxes will be generated by the production increases.

Employment impacts will vary by commodity. Research on export crops is more likely to generate rural employment while research on basic grains is more likely to stimulate urban employment and may displace labor in the rural sector. Increased production and income will have a multiplier effect on other industries in both the rural and urban areas as the demand for non-agricultural goods increases. To the extent that increased grain production keeps food prices low, this facilitates capital formation and employment in the industrial sector. All these benefits should be added to the direct economic gains identified above.

Both basic grains and export crop research should improve nutrition through increases in employment and income, the prime determinants of nutritional level. Also, as production increases and prices fall for basic food crops, the urban poor who spend a high proportion of their income on food should be major beneficiaries in terms of improved nutrition. Increased exports and reductions in their variability through diversification will generate a higher and more consistent level of foreign exchange.

Adoption of research results in Honduras is hindered by a series of factors including lack of credit, extension, and local marketing infrastructure. Benefits, particularly for basic grains, could be increased substantially with improvements in these factors.

The Honduran Agricultural Research Foundation will hire socio-economists to work with production scientists in defining on-farm constraints to technology adoption, and to provide a detailed quantitative assessment of the impacts of research on alternative commodities and research projects as research plans are developed each year. Socio-economic analysis is crucial for maximizing rates of adoption of new technologies and for insuring that the technologies developed contribute to the goals and objectives of the Foundation and Honduras.

The analysis above indicates the high rates of return and the benefit accruing to the Foundation investment. (The complete Economic Analysis is attached as Annex III.D.)

E. SOCIAL ANALYSIS SUMMARY

1. Introduction. The social analysis includes a socio-economic description of producers of certain traditional and non-traditional export crops and of basic grain growers. Traditional export crops selected for the purposes of this analysis are bananas and coffee since in the past few years they have been the first and second most important agricultural export crops in the country. In 1982, they accounted for 53 percent and 37 percent respectively of the country's agricultural exports. Non-traditional export crops selected were cucumbers and melons since many producers of non-traditional export crops either produce or will be expected to produce fruits and vegetables.

The social analysis also includes a discussion of the variables that influence the adoption of technologies by Honduran farmers. The implications for FHIA of the characteristics of both potential groups and the agricultural technology transfer process in Honduras are also discussed.

2. Target Groups

a. Export Crops. The producers of export crops constitute a heterogeneous group of farmers. There are significant variations with respect to the size of the holdings cultivated, the land tenancy arrangements, the technology level of the farm and the social relations of production.

Farmers dedicated to the cultivation of export crops have generally had more access to land than the traditional basic grain growers, and they have taken advantage of available marketing opportunities to put their land into production. Following this trend, small highland farmers have traditionally cultivated coffee as a cash crop. Lowland farmers, on the other hand, have been involved in the production of fruits and vegetables. The cultivation of permanent fruit crops, such as bananas, has been made possible because the traditional banana producers - foreign companies - have been gradually getting out of production and assuming a brokerage role. In some cases, these companies have been replaced by independent farmers or local firms. In others, land previously in the hands of banana companies has been transferred

to agrarian reform beneficiaries who work the land collectively. The cultivation of short-cycled fruit crops and vegetables that also takes place in the lowlands is a new experience, and it has been partially promoted by the government to diversify the agricultural base of land reform beneficiaries. It has been promoted by AID to increase the earnings of both small individual farmers and land reform beneficiaries.

i. Non-traditional Export Crop Producers (Cucumber and Melon). As indicated, both small individual farmers and land reform beneficiaries cultivating basic grains in the lowlands, and also with more access to land than the typical basic grain producer described below, have been attracted by the cultivation of certain exportable fruits and vegetables. These are crops which have an assured market and short growth cycles, and are compatible with basic grains. Since production must be targetted for the United States winter market, they must be cultivated during the second planting season of the agricultural cycle. This may allow farmers to use the land more intensively and to be employed all year round. Crop diversification among these farmers was made possible through considerable institutional support as credit, technical assistance, and packing and marketing services had to be made available. Service cooperatives were eventually organized to provide farmers with these services, thus eliminating the need for previous fragmented efforts carried out by various public and private sector agencies. To date, these cooperatives, managed by a professional staff, have been successful in exporting production and in looking for alternative marketing channels that may be more beneficial to the producers. The size of the plots cultivated with either vegetables or fruit may vary from 1.3 to 5.2 hectares in the case of individual farmers, and may be as high as 10 hectares in the case of land reform beneficiaries. Depending on the quality of production, the volume of production exported, and the export arrangement with the brokers, it has been estimated that net earnings from the cultivation of these crops may vary from $750 to $2,300 per hectare. These are substantial income increments for producers, and since most of them are poor, they may receive a significant impact in their standard of living.

ii. Banana Producers. The banana industry has changed through time. As pointed out earlier, production is being slowly transferred to local producers, and foreign companies have become more interested in marketing production. About 20 years ago, local producers held 11 percent of the land cultivated with bananas and were responsible for 12 percent of total production. As of 1982, however, these percentages had increased respectively to 44 percent and 40 percent.

The following table summarizes the structure of the banana industry in the country. It indicates who the producers are, the area that they have cultivated with bananas, their production volume, and the man-months of employment generated.

		Number of Producers/ Farms	Area Cultivated, in Hectares	Volume of Production, in Milllions of Boxes	Man-Months of Employment Generated
Local Producers	Small	84	1,496	3.07	20,020
	Medium	9	1,102	2.69	14,744
	Large	1	950	2.19	12,711
	Land Reform Beneficiaries	4 coops, 1 associative enterprise	3,423	8.34	45,800
Government-Sponsored Projects		3	366	1.71	4,897
Foreign Companies		2	9,849	27.45	131,780
Total		104	17,183	45.45	229,948

Despite the fact that there have been complaints regarding the conditions under which United Brands and the Standard Fruit Company buy the fruit from local producers, the cultivation of bananas has been an important source of revenue for land reform beneficiaries working the land collectively. The standard of living attained by some of these collective farmers as a result of revenues earned through the cultivation of bananas has made this crop attractive for producers under similar conditions. Over the past year, 14 different cooperatives in the Sula and Aguan Valleys have requested COHBANA to conduct feasibility studies to cultivate a total of 5,855 ha. of land with bananas. COHBANA has indicated that these studies were not conducted because currently there is no funding available to finance additional banana producers.

iii. Coffee Producers. There are about 40,000 coffee producing units in the country. 80 percent of these units have less that 3.5 hectares. The size of a typical unit is 3.1 hectares. A survey conducted in a coffee cultivation region of the country concluded that coffee growers consider themselves essentially basic grain growers, and that they in fact tend to live as such. According to that survey, the major impact of coffee cultivation on the socio-economic condition of coffee-producing families seems to be on their nutritional status since profits earned through the sale of coffee are used essentially to satisfy basic needs, particularly food. As in the case of basic grain growers, families of small coffee producers were made up of an average of 6.5 members. Yet, they lived in one-room houses, made of adobe or bahareque, with compacted dirt floors, and without sanitary systems, not even latrines.

The impact of coffee cultivation on the living standards of producers is partially a result of the fact that most of these farmers do not legally own the land that they cultivate and this precludes access to the country's formal credit system. In some instances, they have had access to credit provided by commercial firms, middlemen or local money lenders. Yet, no investment credit is made available, the cost of borrowing is high, and loans may be provided

only if the farmer turns in his harvest to the lender. It is the lender who will process it and market it. The technology level of coffee farms is rudimentary, access to technical assistance has been limited, and farmers generally do not have adequate equipment and facilities to process an exportable product on the farm. In those cases where production is not sold in advance to money lenders, producers must rely on middlemen to market their harvest.

The Small Farmer Titling Project (522-0173) has been designed to provide fee simple titles to many of these small coffee producers so that they have access to needed collateral to obtain production and investment credit from the banking system, thus allowing them to dispense with informal credit channels currently utilized. On the other hand, the Small Farmer Coffee Improvement Project is geared toward developing the institutional capacity of given development agecies in the country to deal with the financial and technical constraints faced by these small producers. Any research conducted by FHIA in the area of coffee, which might complement IHCAFE's current activities in the field, would help to consolidate the accomplishments achieved by these two projects.

b. Basic Grain Growers. The vast majority of basic grain growers are poor by any measurable standard and they tend to complement their income through off-farm activities.

Basic grain cultivation in Honduras is essentially carried out on minifundia and small farms. Parcels cultivated with basic grains are usually less than 2.5 hectares in size, and despite the fact that farmers claim ownership to the land cultivated, in many cases they are occupants that have bought improvements made on the land by previous squatters. Studies have shown that farmers having less than 6 hectares of land do not use 7 percent of their parcels because of the lack of resources, and do not use 9 percent because the land is either too steep or is not tillable.

The most commonly cultivated crop is corn. However, in certain areas, and as a consequence of ecological conditions, the cultivation of corn is complemented by sorghum. Sorghum is more resistant to drought and has the advantage of being used both for human and animal consumption. Since agricultural in Honduras is rain-fed, corn and sorghum are usually grown during the first planting period of the agricultural cycle, which coincides with the rainy season. Beans are the second most generalized basic crop and they are usually cultivated during the second planting season, but only in certain areas of the country. Rice cultivation is rare, but depending on ecological and agronomic conditions of the region where it is grown, it may be as important as beans.

Technology used by small farmers is rudimentary and labor-intensive. Surveys conducted among farmers in the mid- and late 70's indicate that the use of improved seeds was uncommon, that 96 percent of those interviewed did not use any fertilizer, whether natural or chemical, and that 72 percent did not use

either herbicides or insecticides. The majority of small farmers practice slope agriculture. However, terracing is usually not done and erosion has become an important problem in many of the country's watersheds. In the case of small farmers, labor accounts for up to 77 percent of all farming costs, and about 70 percent of labor requirements are provided by family members. Yields obtained are rather low: 12 qq/hectare for corn, 5.2 qq/hectare for beans, 7.5 qq/hectare for sorghum and 14 qq/hecatare for rice. In some cases, the technology used by basic grain growers has changed since these surveys were conducted. Through the National Basic Grain Program, extension services have been made available to basic grain growers. Among farmers benefitting from this assistance, the use of improved seeds and agricultural inputs has increased and agricultural practices have improved. As of 1983, however, this program provided assistance to only 23 percent of the area cultivated with corn, 28 percent of the area cultivated with beans and 13 percent of the area cultivated with sorghum. The majority of basic grain growers are still not being reached by the public sector's extension program. Private sector institutions are involved in providing this kind of assistance, but despite their higher efficiency, their outreach capacity is still limited with respect to demand.

The situation is not much different for most of the highland peasants that became land reform beneficiaries and that cultivate basic grains. Exceptions to the rule may exist only in the case of collective farmers affiliated with either service cooperatives organized by peasant unions or with model cooperatives sponsored through the Agriculture Sector Program II (522-0150). In their case, credit, technical assistance and marketing services are provided. The technology utilized on their farms is less rudimentary, yields are higher and marketing of production is more efficient. Their standard of living is also higher.

3. The Transfer of Technology: Notes on the Honduran Experience. Recent analyses of programs implemented in Honduras to introduce technological innovations in agriculture have tended to confirm tendencies observed elsewhere. The literature dealing with this question generally presents two conclusions. One, technology transfer in agriculture is a process where certain stages can be detected. And second, the transition from one stage to the next is determined by interrelated variables which are different in nature. That is, where an initial openness toward technological innovations is present, acquaintance, trial and adoption of the technology may follow. In addition, individual, socio-economic and institutional variables may intervene in this process.

Small Honduran farmers that cultivate basic grains, given prevailing low yields and pressing socio-economic needs, have many times recognized the importance of new seed varieties and fertilizers, and in some cases even herbicides and insecticides. The expressed need for technical assistance among small basic grain growers interviewed through the ATAC survey mentioned in the Social Analysis, for example, is an indication of the existence of a certain degree of openness toward technological innovations. The same interpretation is possible in the case of the findings presented by Kawas and

Zuniga in their study with respect to small coffee producers interviewed in Comayagua. Study results indicate that farmers manifested a need for technical assistance in plant varieties, fertilization, pruning and shading. Small livestock raisers in the Comayagua Valley, producing essentially for the market and for profit, have also expressed great interest in technical innovation programs. Their interest lies in programs that would allow them to increase productivity in difficult periods when natural pasture is lacking. Experience shows, in fact, that technological openness increases with increments in the farmer's level of instruction, his status in the community and his integration into the market economy.

Interest in technological innovations is obviously necessary but not sufficient for innovations to take place. Acquaintance with the technology is the first step of the adoption process. Innovations must be presented to farmers and, most importantly, their advantages demonstrated. Change agents, however, need not be concerned about the persuasiveness of their innovative messages in the case of certain agricultural practices and inputs which are already known in Honduras. This is true, for example, for plant spacing, seed varieties and fertilization in the case of basic grain growers. Hernández Calderón (1981) studied the profitability of the use of inputs among such farmers in eight different geographical areas of the country. In four of the geographical areas considered, investment and operational profitability were higher among those using less or no inputs at all than among those showing some farm technification. That is, irrespective of the crop (e.g., corn, beans or rice), profits per (a) unit of variable cost and (b) unit of area cultivated may be higher among farms where technology is labor-intensive than among those where inputs have been incorporated into the production process. For Hernández Calderón, this is an indication of the fact that basic grain growers are not acquainted with either adequate inputs or with the adequate combination of inputs for the types of soils they cultivate. The suggestion is made that the the challenge for change agents in the case of basic grain growers is not to be persuasive but to be didactic. In this case, change agents must be able to educate farmers on how to adequately use known inputs and practices. Persuasiveness and demonstration of advantages of innovations will be most important, nevertheless, in industry transition from acquaintance to trial in the case of entirely new or highly innovative technologies.

The transition from acquaintance to trial is dependent not only on the demonstrations made and on the degree of innovativeness of the technology presented. It also depends on its cost and the access farmers have to credit. A study performed by Suárez and Osorio (1980) on the variables influencing the adoption of technologies among coffee producers in the Northwest of Honduras demonstrated the importance of credit. According to the major findings presented by these authors, farmers receiving no credit have not adopted any of the cultural practices studied. In addition, access to credit is more common among farmers classified as most modern and is less common among the least modern. An analysis of the adoption of technologies proposed through an agricultural research project in the Olancho region, based on the farm systems approach, also indicates that the adoption of fertilizers

and herbicides was not as generalized as expected. This result was a consequence of the fact that farmers did not have the necessary resources to buy either the inputs recommended or the equipment needed to apply them. Similar conclusions were presented by an evaluation of the Rural Technologies Program (522-0157) implemented by the Mission. According to this evaluation, credit is necessary for the adoption of many of the artifact technologies proposed. The evaluators recommended adding an agricultural credit activity to the program if project objectives regarding technological adoption and farmer income were to be achieved.

Adequate use of technologies introduced depends on the type of institutional support provided to farmers. Both communication and learning theory teach us that message content should be designed to fit the characteristics of a particular audience, and that all behavior learned needs to be reinforced so that a certain level of performance is achieved and extinction does not take place. Given the level of instruction of most Honduran farmers, it is important that technological innovations be introduced gradually so that the farmer does not feel overwhelmed by the new activities to be carried out. In addition, timely monitoring of activities is crucial to sustain correct application of the technologies introduced.

Permanent adoption of technologies introduced, on the other hand, is a consequence of the profitability of the technologies proposed, and in many cases profitability is not associated with yields but with marketing channels. New plant densities and inter-cropping proposed through a CATIE-MNR project in three different ecological areas of Honduras were abandoned by many of the farmers participating in the project. According to Hernández (1980), in most cases farmers went back to traditional methods of cultivation because of difficulties in selling either the increased production or the new crops. Similar findings were presented in the evaluation of the Rural Technologies Project mentioned earlier. Technologies introduced through this project that were abandoned after two years of adoption were those associated with losses due to lack of markets. Waterwheels introduced in one particular area of the country were used for the irrigation of land cultivated during the dry season with vegetables such as peppers, tomatoes and onions. After the first year of installation of the waterwheels, prices for vegetables produced were high and the market was assured. In the second year, however, the situation was exactly the opposite. Farmers consequently abandoned the cultivation of vegetables, were not interested in other crops, and returned to traditional cultivation practices. After this experience, fields were again left idle in the dry season and waterwheels were no longer used.

The success of a technology transfer program in agriculture will depend on (a) the degree to which change agents can demonstrate the advantages of new technologies, (b) their capacity to train farmers in the proper use of the technologies introduced, (c) their capacity to provide reinforcement for any learning taking place, and (d) the access farmers have to credit and markets.

4. Implications of Target Group Characteristics for the Foundation

a. Potential direct Project beneficiaries are different categories of producers: small, medium and large. Some of the large producers are land reform beneficiaries who, in order to benefit from economies of scale, are cultivating large holdings on a collective basis. Indirect beneficiaries are workers hired by farmers.

b. The emphasis that the Foundation will have on non-traditional exports, particularly short-cycled fruits and vegetables, appears to be adequate since the cultivation of these crops has been and is likely to continue to be mainly in the hands of both small individual farmers and land reform beneficiaries. Crops of this type have allowed these farmers to be occupied all year round and to bring more land into production. The revenue earned by cultivating these crops could have a significant impact on the standard of living of these farmers, particularly if marketing outlets are adequate. Since these crops are cultivated on flat, irrigated land, the foundation will have to face the challenge of supporting other non-traditional export crops which could equally benefit the typical Honduran farmer. The latter is a small highland producer practicing hillside agriculture.

The attention that Foundation programs may pay to traditional export crops such as coffee is also important, given the number of farmers that are involved in the cultivation of this crop. The same is true in the case of basic grains. Adequate technology and farming practices may double basic grain yields and, once again, allow farmers to use land more intensively.

The future banana research program to be implemented by the Foundation could have important implications since the banana industry generates approximately 230,000 man-months of employment per year.

c. The fact that the Foundation will be searching for alternative dissemination channels apart from the National Extension Service has two advantages. First, certain extension programs implemented by cooperatives and PVO's have tried to eliminate the difficulties characteristic of the National Extension Service, such as poor motivation among extensionists resulting from poor salaries and job instability, erratic supervision, and sporadic and untimely field visits. And second, development institutions in the private sector, particularly cooperatives, often can offer farmers other services such as credit and the marketing of production. As indicated earlier, the lack of credit may prevent farmers from the adopting technological innovations proposed, and inadequate marketing channels may limit the earnings of producers or may force them to abandon the production of certain crops altogether. Service cooperatives such as Fruta del Sol and CREHSUL, described in the Social Analysis, constitute the ideal channels for the dissemination of research findings. It has been estimated that existing service cooperatives provide services to approximately 50,000 farmers. This represents about one fifth of the total population of farmers in the country.

F. Environmental Concerns

Initial Environmental Examination

The activities of this Project fall into the area described in Environmental Procedure Regulations, paragraph 216.2 (c): "Analyses, studies, academic or investigative research, workshops and meetings." Such activities will not normally require the filing of an Environmental Impact Statement or the preparation of an Environmental Assessment. It is possible that an output of this project will be a set of procedures, guidelines or research results which when used would require such an assessment. However, the Project itself proposes only research and directly supportive activities. Under these guidelines, these activities clearly qualify for a negative determination at the time when a threshold decision is determined.

Following Project implementation, a communications function will be undertaken to inform target groups outside of the Foundation about technical practices that can improve crop production. In part, these will be based upon field trials and demonstrations on the fields belonging to the target groups of producers. It is expected that in part the information to be communicated to the producer groups will concern plant pest and disease control. This implies rational use as well as alternatives to manufactured pesticides.

Pesticide use in these activities will be in accordance with the conditions set forth in AID Handbook 3, APPGA-3, Article 5. Experimental quantities of pesticides for the laboratory, greenhouse and field evaluation studies will meet the requirements of AID Regulation 16, part 216.3(B)(2)(C)(III).

Thus, a tightly controlled process for pesticide utilization will be established prior to implementing on-farm demonstrations. At the time that experimental results suggest that such on-farm tests may be desirable, an environmental assessment will be prepared by S&T/AGR/AP and/or CICP, its contractor designee, with final approval by the LAC Environmental Officer prior to proceeding to the on-farm testing phase. This assessment will be amended as necessary when new pesticide formulations are considered at this activity level. Annex I.C. contains the Environmental Threshold Examination.

VI. PROJECT IMPLEMENTATION

A. Host Country Arrangements (Foundation)

The proposed Agreement will be signed by the Director General of the Foundation, the Minister of Finance and Public Credit, and AID. The Foundation is now a legally recognized entity in Honduras as described in Section III.C., and as such will have major implementation responsibility, including the following:

1. Selection and Hiring of Director General for FHIA. At the founders' meeting held in May 1984, the General Assembly selected an Interim Board of Directors and appointed a Search Committee to make recommendations concerning candidates for an Interim Director General and a final Director General. During its first official session, the Interim Board appointed, at the recommendation of the Selection Committee, an Interim Director General and approved a position announcement for worldwide distribution for a final Director General. It will be the responsibility of the Interim Board of Directors to select a permanent Director General and recommend his candidacy to the General Assembly for approval. It is anticipated that this will occur before September 30, 1984.

2. Naming of Final Board of Directors. It will be the responsibility of the Interim Board of Directors to appoint a final Board of Directors with representation and duration of appointment as established in FHIA's by-laws. This should be accomplished prior to December 31, 1984.

3. International Agreements. The Director General and Board of Directors will have the responsibility of negotiating and finalizing agreements with other institutions for support and services. The Foundation will initially sign an agreement with just one of the International Agricultural Research Centers for establishing a basis of cooperation with that center on basic grain research. Such an agreement with one of the IARC's will be signed by both parties prior to June 30, 1985. Agreements with other IARC's will subsequently be signed as appropriate.

Other agreements, with national and international educational centers and other donor organizations (such as FAO), will also be the responsibility of the Foundation.

4. Interinstitutional Project Implementation Agreement. A Project Implementation Agreement will be developed by the Foundation and the Ministry of Natural Resources, and be approved by AID. The document will establish formally the responsibilities of all parties as described by the Project Agreement and Decree 85, which legally establishes the Foundation in Honduras. At a minimum, the Interinstitutional Implementation Agreement will:

a. establish the disbursement mechanisms for AID funds as they affect the Foundation; and

b. establish clearly the terms and conditions for collaboration between the MNR and the Foundation. The following are illustrations of the types of arrangements to be established:

The Foundation will:

- Collaborate with the MNR in production of materials in the various media (including radio) for dissemination directly to farmers;

- collaborate with the Extension Service in pre-testing and conducting impact evaluations of materials produced by the Unit;

- collaborate with the MNR in designing and conducting studies at the farmer level, particularly in areas in which research staff have an input (such as field days, on-farm adaptive research trials, demonstrations, publications, radio programming, etc.);

- collaborate with the MNR Communication Unit in developing, maintaining and operating a communication network linking together all audiences of both, as appropriate;

- collaborate with the Training Unit, Foundation research staff, and the MNR in organizing courses on technical agriculture for extension workers;

- participate in planning, organizing and conducting special events organized by FHIA, such as field days, conferences, meetings, etc., coordinating as appropriate with the MNR.

The MNR will:

- assign scientists and extension personnel to work with the Foundation;

- make available its central production facility for Foundation needs; and

- assist in arranging field days and demonstration plots.

B. A.I.D. Arrangements

Project management responsibility will rest with the Office of Agricultural Development, which will be assisted by the Office of Development Programs and Management Support, the Office of Development Finance, and the Controller's Office. A Project Liaison Officer will be contracted to assist the direct-hire Project Manager to implement the Project.

1. Disbursement Procedures. Except under those specific instances where A.I.D. will be the procurement agent for Project commodities services, A.I.D. will disburse funds for all Project activities directly to the Honduran Agricultural Research Foundation. The Foundation will prepare plans for projected financial needs on a quarterly basis, and will submit them to AID for approval. Once approved, disbursements will be made. The Foundation will draw down these funds and account for them in accordance with the Project Agreement and normal AID advance liquidation procedures.

2. Procurement Procedures. AID Development Grant funds, totalling $20,000,000, will be used for all Project activities (excluding direct financing for the Foundation's banana research program).

Under the Project, there will be a number of major off-shore procurements. All technical assistance and commodities are anticipated to be of U.S. source and origin. Commodities procurement will include vehicles, computer equipment, lab equipment and other miscellaneous equipment and supplies. In the case of off-shore procurement, FHIA does not currently possess the necessary experience and expertise to carry out this task. Therefore, it has been determined that the most advantageous procurement mechanism would be for the Foundation to enter into a long-term arrangement with a Procurement Services Agent (PSA). The PSA will be required for all Project-financed off-shore procurement activities, with the possible exception of equipment and materials for the Communications Unit.

3. Project Monitoring. Project monitoring will play an essential role in the Project. It is especially critical, as the Mission's Agricultural Research Project (522-0139) has demonstrated vividly, that regular and substantive monitoring take place to assist in Project implementation. Given the location of the Project in the San Pedro Sula area, on the spot identification and rapid solution of logistical and other problems will prevent implementation delays.

This detailed Project monitoring will be the responsibility of a Project Liaison Officer to be contracted by the Mission. This person will be attached to the Foundation and assigned to reside in San Pedro Sula. He/she will be professionally fluent in Spanish (FSI S-3, R-3) and have significant experience in Latin America working with agricultural development projects. He/she should also be very familiar with AID project implementation procedures. A minimum of a Master's degree in a relevant field along with significant educational/experiencial background in the administration/management of research institutions will be required. It is expected that this person will be contracted and in place by the end of the second quarter of FY85.

C. Implementation Plan

Implementation plans and schedules are attached as Annex I.D. These schedules are based on the Mission's current best estimates of technical assistance, equipment, and supply requirements. Since the Foundation has only recently been organized, sufficient staff and time have not been available to prepare precise, detailed plans and schedules. An illustrative list of needed equipment for both the Research Program and the Communications and Development Directorate was developed during Project preparation and is attached in Annex I.D.

The Foundation, with AID assistance, will prepare a more detailed implementation plan after the Project Agreement is signed.

D. Evaluation Plan

The creation of a private sector institution to carry out agricultural research in basic grains and export crops is a new experience in Honduras. Evaluation activities will, consequently, focus on the developed capacity of

such an institution to successfully (1) implement an ongoing research program consistent with the needs of Honduran producers, (2) disseminate research findings both nationally and internationally, (3) contribute to increasing agricultural yields, national production and the country's export-crop base, and (4) establish an independent financial base.

This Project will have two formative evaluations and one final evaluation. In addition, data from existing surveys and those under preparation will be utilized to establish a base from which to measure Project impact.

Variables to be measured will include: agricultural practices, acquaintance with and use of modern technology, agricultural yields, and post-harvest practices.

The first formative evaluation will concentrate on progress made with respect to the organization of the Foundation's operations, and the initiation of its research and dissemination programs and its fund raising activities. Special attention will be paid to (1) the impact of T.A. on initial Foundation activities, (2) the arragements made to obtain suitable land and facilities to conduct research in different regions of the country, (3) the organization and staffing of the research teams, and (4) the Foundation's capacity to continue the banana breeding operation research and to initiate adaptive research for basic grains and non-traditional export crops. Attention will also be paid to efforts made (5) to obtain initial financial assistance from possible donors, and (6) to establish needed linkages with established producer, processing and trade organizations, the National Extension Service and other national agricultural research and educational institutions to disseminate research findings. This evaluation will be conducted during the third year of Project implementation.

The second formative evaluation will assess (1) the efficiency of the Foundation's internal structure and administrative procedures, (2) the extent to which the farming systems research approach has been institutionalized, (3) the progress made with respect to initiating new programs for traditional export crops, such as coffee, and in relation to the expansion of the non-traditional export base, (4) the accomplishments achieved in relation to training efforts to increase the agricultural research human resource base in the country, (5) the efficiency of the established network for the dissemination of research findings, and (6) accomplishments achieved in obtaining needed financial support to assure sustained development of the Foundation. This evaluation will be conducted during the fifth year of Project implementation.

The final evaluation will be conducted during the last year of the Project's life. It will assess the quality of the research and dissemination program as well as the impact of Project activities on increasing basic grain production and in contributing to diversity the country's agricultural export base. At the producers' level, changes in land use, agricultural practices, level of technology used at the farm, productivity, and farm income will be assessed. The impact of the Project's basic grain activities on local consumers will also be evaluated.

VII. CONDITIONS, COVENANTS, AND NEGOTIATING STATUS

A. Conditions and Covenants

In addition to the standard conditions and covenants, the Mission recommends that the Project Authorization include the following:

1. Conditions Precedent

a. Prior to any disbursement of funds, or the issuance of any commitment documents under the Project Agreement pursuant to which disbursement will be made, except for the procurement of foreign technical assistance, the Foundation shall, except as A.I.D. may otherwise agree in writing, submit evidence that the Foundation has established a financial/accounting system acceptable to A.I.D.

b. Prior to any disbursement for specific research in basic food crops (corn, beans, sorghum or rice), the Foundation will cause to be provided to A.I.D., in form and substance satisfactory to A.I.D., copies of a implementation agreement between the Foundation and the Honduran Ministry of Natural Resources which specifies the responsibilities of each entity for basic grains research under the Project and how over-all agricultural research in Honduras will be coordinated between the entities.

c. Prior to any disbursement of funds for any individual research program, the Foundation shall, except as A.I.D. may otherwise agree in writing, furnish to A.I.D., in form and substance satisfactory to A.I.D., evidence that the Foundation has adquired a sufficient quantity of suitable land and the necessary financial resources to effectively carry out the program.

2. Covenants. The Government of Honduras will be a party to the Project Agreement. As such, the GOH shall covenant that, unless A.I.D. otherwise agrees in writing, it will:

a. Maintain the status which provides FHIA with exemption from taxes, tariffs and any other surcharges on the import of equipment and supplies and on salaries, household effects, vehicles and other effects of FHIA's international staff.

b. Maintain budgetary and other support for FHIA operations for a period of ten years, including assistance in the provision of present and future land requirements.

B. Negotiating Status

This Project has been jointly designed with the Ministry of Natural Resources and the Acting Director General of FHIA. The Minister of Natural Resources, as a founding member of FHIA and a permanent member of the Board of Directors, has been personally involved in Project design and has assigned personnel to assist in the various analyses. The Executive Director of the Honduran Agrarian Institute (INA), who is also a founding member of FHIA, has been

instrumental in assisting FHIA in negotiations for the purchase of suitable land for research purposes. The Project has been discussed in depth with representatives of the Honduran private corporate and financial sectors, who have demonstrated high levels of enthusiasm and support for the Project. Two of those contacted have already committed financial support for the Project. In addition, the Ministry of Finance and Public Credit is up to date on the design of the Project. The terms and conditions as presented in this paper have been fully discussed with, and are acceptable to, the FHIA Board of Directors and the GOH. (See Letter of Application in Annex II.B.)

ANNEX I.A

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 84 to FY 94
Total U.S. Funding: $20,000,000
Date Prepared: May 23, 1984

Project Title: AGRICULTURAL RESEARCH FOUNDATION
Project Number: 522-0249

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes:	Measures of Goal Achievement:		Assumptions for achieving goal targets:
To increase incomes for farmers and generate additional employment.	- % increase in GDP - 25% average increase in farmer incomes - 10,000 jobs created by 1990	Central Bank statistics CONSUPLANE estimates Mission calculations	Stable political environment
PROJECT PURPOSE:			
To establish a private, non-profit Agricultural Research Foundation which will expand and improve research in Honduras.	A nationally, regionally, and world renown Agriculture Research Center.	Survey of originating request points. Review of foundation records.	Top-notch researchers and managers continue their willingness to work in Honduras.
	Three well-functioning departments in research, communication-outreach and analytical services: fully staffed departments	Review of Foundation records.	
OUTPUTS:			
1. Foundation Organization - Legally constituted Foundation, established and operating effectively	-General Assembly, Board of Directors, Oversight Committee Director General, Permanent Staff in Research and Communication Units, staffed administrative unit -Working capability established -Drawing research requests, grants and endowments to provide long-term existence for the Foundation.	Survey of Foundation Records: site visits	

2. Research Program			
-Expanded production of non-traditional crops for exports.	$65.0 million in sales by 1990 for 12 commodities.	Government records, Mission records and evaluations	Commodity prices do not decrease below production costs in a sustained basis
-Increased productivity of traditional export crops	$400 million in foreign exchange earnings -1 black sigatocka resistant variety developed for a savings of 15 million over LOP		Farmers continue to participate in the Program
-Increased production of basic food grains	-6 new varieties of basic grains developed -self-sufficiency in corn, beans, sorghum, rice -30% increase in yields		
OUTPUTS			
3. Communications, Outreach and Institutional Dev. -improved dissemination of technologies to farmers and producers	Systematic flow of information from the Research Foundation, through intermediary extension agents to the farmer with field results flowing back to the Foundation (30 short training courses, 30 pamphlets, 20 video tapes, 300 half-hour radio programs, 300 radio spots, 3 technical journals, 70 on-farm demonstrations).	Project Evaluations Spot site checks Interviews	
-stronger linkages between national, regional, and international research centers	Continuous exchange of information expertise and materials between these institutions.	Project evaluations Interviews Foundation Records	
-improved human resource base through training	20 person years training for mid-and upper-level foundation staff. 200 local extensionists trained to improve performance	Project evaluations Spot checks Interviews Performance Reports	

-enhanced agricultural information services	Up-to-date library containing reference information on all crops systems dealt with	Project evaluation. Spot checks
4. Technical Analytical Services	500,000 separate tests conducted generating over $4.0 million	Foundation records

INPUTS

	AID	GOH	Other Donors/ Private Sector		
Administrative Operating Costs	6,835	1,175	1,180	USAID/Controllers	Private Sector contributes as
Capital Investments	1,060	1,385	675	Office Records	expected
Experimental Substations	220	150		Foundation Records	
Research Programs	5,820	2,390	5.145	Surveys	
Communications and Development	2,790	900			
Technical Analytical Services	2,700				
Evaluation	200				
Project Liaison Officer	375				
	20,000	6,000	7,000		

I.B PID Guidance Cable

I B. 1

UNCLASSIFIED STATE 088700/01

LB

ACTION: AID INFO: AMB DCM ECON CHRON/6

RECEIVED USAID. TEGUCIGALPA 27 MAR 1984 O & R

VZCZCTGC159
PP RUEHTG
DE RUEHC #8700/01 0870755
ZNR UUUUU ZZH
P 270748Z MAR 84
FM SECSTATE WASHDC
TO AMEMBASSY TEGUCIGALPA PRIORITY 9323
BT
UNCLAS SECTION 01 OF 03 STATE 088700

LOC: 362 539
27 MAR 84 1447
CN: 19427
CHRG: AID
DIST: AID

AIDAC

E.O. 12356: N/A
TAGS:
SUBJECT: AGRICULTURAL RESEARCH FOUNDATION PROJECT (522-0249) -- PP GUIDANCE CABLE

-- THE DAEC REVIEWED AND APPROVED SUBJECT PID ON FRIDAY, MARCH 2, 1984. THE BUREAU FINDS SIGNIFICANT MERIT IN THE CONCEPT OF A PRIVATE SECTOR FOUNDATION WHOSE RESEARCH WILL BE DIRECTLY SUPPORTED AND FUNDED BY ITS PRIVATE SECTOR CLIENTELE AND OTHER INTERESTED ORGANIZATIONS. AS EVIDENCE OF THE VIABILITY OF THE PROJECT, WE URGE THE MISSION, IN ADDITION TO THE OTHER CONTEMPLATED PREPARATION ACTIVITIES, TO IDENTIFY AND OBTAIN COMMITMENTS FROM AND AGREEMENT WITH PRIVATE SECTOR CLIENTELE FOR RESEARCH SUBPROJECTS ON BANANA RESEARCH AND FOR AT LEAST TWO OR THREE EXPORT CROPS PRIOR TO PP PRESENTATION.

-- DURING PP DEVELOPMENT, THE MISSION SHOULD CONSIDER THE FOLLOWING:

1373 Agr

1. AID POLICY:

UNDER THE DIVERSIFICATION COMPONENT, THE MISSION WILL EXAMINE THE EXPORT POTENTIAL AND RESEARCH NEEDS OF SEVERAL CROPS. THE MISSION SHOULD TAKE INTO ACCOUNT POLICY DETERMINATION NO. 71 WHICH REQUIRES THAT YOU CONSIDER THE POTENTIAL IMPACT OF RESEARCH ON SUCH CROPS AS SUGAR, PALM OIL AND CITRUS ON U.S. PRODUCERS. THE MISSION SHOULD AVOID DIRECT A.I.D. FINANCING OF RESEARCH FOR THESE CROPS.

2. FUNDING:

THE TEN-YEAR PROJECT ENVISIONS THE USE OF DOLS 20 MILLION IN A.I.D. GRANT FUNDS. THE MISSION'S YEARLY OBLIGATION STRATEGY SHOULD BE DEALT WITH DURING PP DEVELOPMENT, AND THE DAEC REVIEW. THE BUREAU WISHES THE MISSION TO INVESTIGATE USING LOCAL CURRENCY GENERATIONS FOR LOCAL COSTS THAT ARE AMENABLE TO SAID FINANCING, THEREBY CONSERVING DEVELOPMENT GRANT (DG) FUNDS FOR FOREIGN EXCHANGE COSTS.

ACTION AG
NO.
INFO OFFICES
D
DMD
RLA
MGT
PGR
CONT
OET
HRD
HRD/E
HRD/H
HRD/P
HRD/SEP
AGR
ENG
RHUDO
JAO
CHRON
READER
COMPUT
OTHER

3. MARKETING STUDY AND PATENT CONCERNS:

A. DURING THE SURVEY FOR ITS DEMAND ANALYSIS, THE MISSION IS REQUESTED TO INTEGRATE QUESTIONS RELATING TO THE DESIRE OF CLIENTS TO ACQUIRE PATENTS. POTENTIAL CLIENTS SHOULD BE CANVASSED ABOUT THEIR VIEWS ON WHETHER OR NOT THE FOUNDATION SHOULD BE CAPABLE OF PROTECTING RESEARCH RESULTS FOR FUTURE PATENTS. THESE QUESTIONS SEEK TO DETERMINE POTENTIAL CLIENTS WILLINGNESS TO PAY FOR RESEARCH, AND THE IMPLICATIONS REGARDING THE FOUNDATION'S FINANCIAL VIABILITY IF PATENTED RESEARCH IS NOT AVAILABLE.

B. GIVEN THE BENEFITS FROM FOR-PROFIT AGRICULTURAL RESEARCH CARRIED OUT IN THE U.S., IT WOULD APPEAR THAT PATENTED RESEARCH RESULTS DO NOT CONFLICT WITH ECONOMIC DEVELOPMENT. TO THE CONTRARY, IT APPEARS AS IF IT IS IMPORTANT TO THE DEVELOPMENT AND DISSEMINATION OF RESEARCH RESULTS AND MAY BE ESSENTIAL TO PRIVATE SECTOR SUPPORT OF THE FOUNDATION. THE MISSION SHOULD SURVEY SIMILAR FOUNDATIONS OR AUTONOMOUS ORGANIZATIONS IN THE U.S. AND LATIN AMERICAN REGION TO DETERMINE WHETHER OR NOT THESE INSTITUTIONS PERFORM PATENTED RESEARCH, THE

REASONS WHY, AND WHAT THE ADMINISTRATIVE, MANAGERIAL, FINANCIAL AND LEGAL COSTS ARE FOR EITHER APPROACH. THE PP SHOULD CONTAIN A DISCUSSION OF THESE APPROACHES AND HOW THEY WOULD IMPACT ON THE FOUNDATION.

C. WHATEVER THE DECISION REGARDING PATENTS, THE MISSION SHOULD KEEP IN MIND THAT ALL RESULTS STEMMING FROM DIRECT A.I.D. FINANCING MUST BE EFFECTIVELY DISSEMINATED, PARTICULARLY TO SMALL AND MEDIUM FARMERS.

4 S AND T BUREAU PARTICIPATION:

A. SAA/S AND T BUREAU DR. NYLE BRADY HAS TAKEN A PERSONAL INTEREST IN THE DEVELOPMENT OF THE SUBJECT PROJECT. HE IS CONCERNED THAT EXISTING AND FUTURE S AND T/AGR RESEARCH PROJECTS BE APPROPRIATELY INTEGRATED INTO OR LINKED WITH FOUNDATION RESEARCH PROGRAMS. AT THE PRESENT TIME THERE ARE EIGHT S AND T/AGR FINANCED PROJECTS IN HONDURAS. S AND T/AGR IS INTERESTED IN IMPLEMENTING THESE ACTIVITIES IN COLLABORATION WITH THE FOUNDATION TO INCREASE EFFICIENCY AND AVOID DUPLICATION.

S AND T/AGR ADVISES THAT ITS INVOLVEMENT DOES NOT IMPLY A SUBSTITUTION OF S AND T FUNDS FOR THE PROPOSED GRANT. HOWEVER, IT ENVISIONS A TYPE OF IN-KIND TRANSFER THAT WILL MAKE AVAILABLE S AND T PROJECT PERSONNEL, PROFESSIONAL EXPERTISE AND UNIVERSITY BACKSTOPPING
BT
#8700

NNNN

SECTOR FINANCING, OTHER DONOR SUPPORT AND BANANA PRODUCING COUNTRY REQUESTS. ALTHOUGH THE UNIT WILL BE SUSTAINED THROUGH REQUESTS FROM THE FOREGOING PARTIES, THE MISSION STRATEGY SHOULD STRESS MAINTAINING THE FOUNDATION AS A PREMIER BANANA RESEARCH INSTITUTE.

8. ECONOMIC ANALYSIS: THE MISSION SHOULD APPLY THE TRADITIONAL WITH AND WITHOUT APPROACH TO THE ECONOMIC ANALYSIS OF THE PROJECT. WHILE NUMEROUS STUDIES HAVE

INDICATED THE HIGH RATE OF RETURN PROVIDED BY AGRICULTURAL RESEARCH PROJECTS, THE PROJECT DESIGNERS HAVE THE RESPONSIBILITY OF TESTING THAT HYPOTHESIS BY USING THEIR JUDGMENT TO IDENTIFY AND QUANTIFY THE EXPECTED BENEFITS AND COSTS. ANALYSIS OF EXPERIENCES IN OTHER COUNTRIES SHOULD HELP IN IDENTIFYING A MINIMUM ACCEPTABLE RATE OF RETURN. THE DELPHI METHOD ALLUDED TO IN THE FINAL SENTENCE OF THE ECONOMIC SECTION WOULD NOT APPEAR TO BE APPROPRIATE FOR THE FINAL STAGE OF THE ECONOMIC ANALYSIS. AT AN INTERMEDIATE STAGE, HOWEVER, IT MAY PROVE TO BE AN EFFICIENT PROCEDURE FOR ELIMINATING A LARGE SET OF COMPETING ALTERNATIVES.

9. RELATIONSHIP WITH OTHER DONORS:

THE PID LACKS ANY SUBSTANTIVE DISCUSSION OF HOW THIS PROJECT WILL RELATE TO OTHER DONOR ACTIVITIES. THE PP SHOULD DISCUSS WHETHER OTHER DONOR PROGRAMS WILL COMPLEMENT OR DUPLICATE ACTIVITIES IN THIS PROJECT, AND THE MISSION'S STRATEGY FOR COORDINATING THESE ACTIVITIES. THE DISCUSSION SHOULD INDICATE THE LEVEL OF DONOR SUPPORT FOR CREATING A NON-PROFIT RESEARCH FOUNDATION, AND TO WHAT EXTENT THEY ARE WILLING TO PROVIDE FINANCING FOR SPECIFIC COMPONENTS IN THE PROJECT.

10 ENVIRONMENTAL EXAMINATION:

THE BUREAU SUGGESTS THAT THE MISSION SPECIFY THE TYPES
BT
#8700

NNNN

CAPABILITY. S AND T/AGR IS COMMITTED TO ASSIST THE EFFORT AND IS AWAITING FURTHER GUIDANCE FROM THE MISSION AS TO HOW IT MIGHT CONTRIBUTE TO THE PROJECT.

B THE PLANNED COMMUNICATIONS/OUTREACH UNIT OF THE RESEARCH FOUNDATION PROVIDES ANOTHER OPPORTUNITY FOR COLLABORATION WITH THE S AND T BUREAU. THE HUMAN RESOURCES DIRECTORATE IS PRESENTLY DEVELOPING A PROJECT IN THE AREA OF COMMUNICATIONS SUPPORT FOR TECHNOLOGY DEVELOPMENT AND TRANSFER; LAC WILL BE A PRIMARY REGION OF EMPHASIS INITIAL DISCUSSIONS WITH MISSION AND S AND T/ED STAFF INDICATE THAT COLLABORATION BETWEEN THE PROPOSED S AND T PROJECT AND THE RESEARCH FOUNDATION COMMUNICATIONS UNIT IS PLAUSIBLE AND DESIRABLE. DURING PP DEVELOPMENT, S AND T/ED HAS INDICATED ITS WILLINGNESS TO PROVIDE TDY ASSISTANCE TO HELP FOSTER THIS COLLABORATIVE STRATEGY.

5. LA LIMA FACILITIES: THE PID INDICATES THAT UNITED BRANDS COMPANY WILL DONATE TO THE FOUNDATION ITS RESEARCH FACILITIES IN LA LIMA . IT IS NOT CLEAR, DONATION OR ITS VALUE. THE PP SHOULD CONTAIN A DISCUSSION DELINEATING THE FACILITIES, EXPERTISE, RESEARCH RECORDS, GERM PLASM STOCKS, EQUIPMENT, AND TEST FARMS, ETC. TO BE MADE AVAILABLE TO THE FOUNDATION. THE MISSION SHOULD ALSO IDENTIFY THE ADDITIONAL ITEMS NECESSARY TO EQUIP THE EXPANDED RESEARCH PROGRAM.

6. RESEARCH COLLABORATION:

A. THE PID ENVISIONS A SYSTEMATIC APPROACH CONCERNING THE SHARING OF INFORMATION AMONG VARIOUS NATIONAL, REGIONAL AND INTERNATIONAL INSTITUTIONS CONDUCTING RESEARCH. THE COMMUNICATIONS UNIT WILL BE THE PRIMARY ENTITY RESPONSIBLE FOR THIS EFFORT IN THE FOUNDATION. DURING PP DEVELOPMENT, THE MISSION AND INTERIM BOARD OF TRUSTEES SHOULD EXAINE THE ON-GOING ACTIVITIES IN THE OTHER INSTITUTIONS. THE PP SHOULD ESTABLISH GOALS FOR THE INFORMATION-SHARING SYSTEM AND DESCRIBE SPECIFIC PLANS FOR IMPLEMENTATION IN ORDER TO AVOID DUPLICATION AND TO ENABLE THE FOUNDATION TO CONCENTRATE ITS ACTIVITIES DURING THE LOP THE PLAN SHOULD CLARIFY THE INSTITUTIONAL RELATIONSHIPS BETWEEN THESE ORGANIZATIONS, PARTICULARLY IN THE DOMAIN OF BASIC GRAINS AND EXPORT CROPS.
LA LIMA, OTHER COMPANIES OR RESEARCH FOUNDATIONS MAY BE INTERESTED IN THEIR USE. THE MISSION SHOULD EXPLORE THIS POSSIBILITY AND DETERMINE INTEREST IN USING THE FACILITY ON A COST-REIMBURSEABLE BASIS.

7. BANANA AND PLANTAIN RESEARCH:

BANANA AND PLANTAIN RESEARCH AT LA LIMA HAS BEEN THE HALLMARK ACTIVITY OF THAT INSTITUTION AND HAS HELPED BANANAS BE ONE OF THE LEADING SOURCES OF FOREIGN EXCHANGE FOR HONDURAS. THE ROLE OF THIS COMPONENT IN THE PROJECT SHOULD NOT BE DE-EMPHASIZED, GIVEN THE ABILITY OF THE BANANA RESEARCH UNIT TO ATTRACT PRIVATE

OF PESTICIDES BEING CONSIDERED. THE MISSION SHOULD UNDERTAKE A PESTICIDE RISK/BENEFIT ANALYSIS ON THESE PESTICIDES TO DETERMINE THE POTENTIAL ENVIRONMENTAL IMPACT. TO ACCOMPLISH THIS TASK, THE MISSION SHOULD CONTACT S AND T/AGR, C. COLLIER, TO PROVIDE ADVICE ON TECHNICAL ASSISTANCE FROM CICP OR OTHER SUITABLE SOURCE. CICP HAS CONSIDERABLE EXPERIENCE IN CONDUCTING THE ABOVE ANALYSIS.

THE PID INDICATES THAT THE FOUNDATION WILL REQUEST A WAIVER FROM A.I.D. TO PERMIT THEM TO USE PRODUCTS THAT ARE CUSTOMARILY APPLIED IN AGRICULTURAL PRODUCTION. UNDER CURRENT ENVIRONMENTAL GUIDELINES, A.I.D. CAN NOT GRANT WAIVERS FOR PESTICIDES.

11. EARLY ALERT SYSTEM:

PERSUANT TO THE GRAY AMENDMENT AND STATE 006665, THE PP SHOULD CONTAIN A CONTRACTING PLAN WHICH DESCRIBES THE TYPES OF CONTRACTS AND TYPES OF ORGANIZATIONS TO WHOM CONTRACTS WILL BE AWARDED. SPECIAL EMPHASIS SHOULD BE GIVEN, WHERE APPROPRIATE, TO SMALL, MINORITY OR WOMEN OWNED FIRMS, BLACK COLLEGES AND UNIVERSITIES, AND PVOS CONTROLLED BY BLACK AMERICANS, HISPANIC AMERICANS, WOMEN, OR THOSE WHO ARE OTHERWISE ECONOMICALLY AND SOCIALLY DISADVANTAGED.
SHULTZ
BT
#8700

NNNN

C. Summary Response to PID Guidance Concerns

The Mission received the PID Guidance Cable on March 27, 1984 (Annex I.B.) and immediately began to address the issues raised. The following is a summary of the response to the Guidance Cable, with specific references to sections of the PP or Annexes.

1. PD-71

The Mission requested a waiver for PD-71 from AID/W on July 13 (see Tegucigalpa 09355 in Annex II.E.), for both the Research Foundation Project and the parallel Export Development Development and Services Project. Although the Mission anticipates a positive response to this request, if it shoud be denied, the Mission will take steps to assure that no direct AID financing will be used in support of the specified crops.

2. Funding

As presented in the Financial Plan (Section V.C.), the Mission has investigated the use of local currency generations for Foundation local costs, particularly during the initial years of operations. A total of US $3 million has been programmed for the purchase of land, construction and repair of buildings and certain operating expenses.

US $500,000 is programmed for FY 1984 for the Mission's ESF Program and US $2.5 million in FY 1985 from the PL 480 Title III Program. (See letter of application in Annex II.B. which is the GOH official request for the use of Title III funds for this purpose.) The funds do not substitute for Development Grant funds, rather provide for a more beneficial obligation strategy as shown in Annex III.G.)

3. Marketing Study and Patent Concerns

The Mission contracted, as a member of the design team, an organizational development and fund-raising specialist. Among his assignments was the requested Demand Analysis with specific questions related to patented research results. The results of that analysis, as detailed in Annex III.E., indicate that "there appears to be no concern on the part of prospective clients and cooperators relating to patent submission or protection."

Similar institutions surveyed (CIAT, CATIE and Boyce Thompson Institute) responded that they do not undertake such research activities due to potential legal difficulties. The demand survey stated, "patented research is not recommended as a course of action for the Foundation". As a result, the final design of the Project is such that results of research conducted by the Foundation will be made available to all interested parties. The By-Laws of the Foundation (Annex III.H), state in Article 3 that one of the objectives of the Foundation is to "generally encourage the agricultural development in the country, through science and technology". They also state, in Article 8, that the Foundation may "publish the results of its research and distribute said publications, including by sale therof".

4. S&T Bureau Participation

The Mission request, and received, technical assistance from the S&T Bureau during Project design. The Agency's senior agricultural scientist spent two weeks in Honduras assisting Mission staff in general design and review of the Project. His assistance in technical issues was invaluable and he prepared a section of the PP (Section VI.B.I.) which details current and planned S&T activities in Honduras and presents a strategy for coordinating those activities with the Foundation.

A representative from S&T/ED spent one week in Honduras assisting the Mission in coordinating the Foundation's Communication and Development Unit with the proposed Agricultural Communication Project. Those efforts are discussed in Annex III.B.

5. La Lima Facilities

The Mission contracted, as part of the design team, a specialist in Communications and Information dissemination, to:

- Analyze the various audiences of the Foundation's Communication/Outreach Program and identify specific program objectives related to each of the audiences.

- Define mechanisms for technical exchange between the Foundation and National/International agricultural research and educational institutions, specifying participating institutions.

- Detail the communication unit's role and links with Research and Fund-raising.

Thus, the consultant examined the Foundation's Communication/Development Unit and made specific recommendations concerning information sharing with other institutions. The final report, which recommended the establishment of a Library and Information Services Unit within the Communications/Development Unit, is available in the USAID/H. That report has been summarized and is included in the PP, as Annex III.B. Briefly, one of the major responsibilities of the Library and Information Unit will be to develop and maintain an exchange program with national, regional and international agricultural research organizations to avoid duplication of efforts. The Annex describes one of the main audiences of the Foundation as "National and International Agricultural Research and Educational Institutions with the Main Program Objective" to develop continuing and effective interchange of research plans, progress and results. and other research information with institutions engaged in similar research and/or educational programs.

6. Banana and Plantain Research

The Mission recognizes and agrees with the AID/W assessment that the banana breeding program in La Lima has been the Hallmark activity of the Center for many years. The Mission further considers banana/plantain production to be of

critical importance to Honduras because of export earnings, employment and domestic nutrition. It is our belief that the worldwide interest in this research, and the worldwide benefits which would be derived from it, will make it feasible for the Foundation to obtain financing for this work from other sources. Expressions of interest from major transnational banana companies, the FAO, and other banana producing countries (see Annex III.5.) support this belief.

We are aware that international effort to create a network for banana/plantain research will require a year or more to produce results. FAO has expressed interest in continuing its existing support, and we expect additional financing from the banana companies.

We strongly support creation of the network in banana/plantain research and believe this to be a very appropriate activity for S&T and ROCAP assistance, in coordination with other donors.

For all of the above reasons, the Project design includes the banana/plantain program as a major part of the research activities, but includes it as a "non-add" item due to the high potential of outside financing. The Foundation will support the program administratively and through the Communication/Development Unit in its fund-raising efforts.

7. Economic Analysis

In the PID, an expost analysis of the economic impacts of agricultural research was presented and used in the normative sense to establish the need for AID financial and technical asistance. For the project paper, an ex ante approach has been used to establish that the high rates of return that have typically accured to agricultural research in other countries can in fact occur in Honduras through the Research Foundation. A "Delphi Method" of consultations with leading Honduran and foreign technical experts was used to establish the rough bounds of alternative research focuses. An interative method of estimates of costs/returns and financial indicators was applied in the traditional "with and without approach" of economic analysis to prove the economic viability of the Project. The key economic issues with respect to resource allocation for research, as well as quantitative and qualitative assessments are presented.

8. Relationship with Other Donors

Section IV.B. of the PP gives a detailed description of other donor programs related to agricultural research in Honduras and describes potential relationships between the Foundation and those programs.

9. Environmental Examination

The Mission requested assistance from S&T/AG in order to conduct a pesticide risk/benefit analysis on the pesticides being considered for use under the Project. S&T/AG responded by cable that it wasn't feasible to conduct such

analysis at this time and that, in consultation and concurrence with LAC/DR, specific work would be necessary in the PP environmental examination. S&T/AG assisted the Mission in preparing the Environmental Concerns section of the PP (Section V.F.).

10. Early Alert System

The contracting plan is included in the Implementation Plan summarized in Section VI and attached as Annex I.E. The Mission proposes that the Foundation enter into a long-term arrangement with a PSA for all Project off-shore procurement. A list of 8(a) firms will be requested from SEC/COM/SBA from which the PSA will be selected. Furthermore, the Mission will explore with the American Association of Black Colleges and Universities (AABCU) the possibility of their involvement in certain aspects of technical assitance.

ANNEX I. D.

Initial Environmental Examination

LAC/DR-IEE

ENVIRONMENTAL THRESHOLD DECISION

Project Location	:	Honduras
Project Title and Number	:	Agricultural Research Foundation 522-0248
Funding	:	$20 million Grant
Life of Project	:	10 years
IEE Prepared by	:	Gordon Straub, USAID/Honduras
Recommended Threshold	:	Negative Determination
Bureau Threshold Decision	:	Concurrence with recommendation
Action	:	Copy to Anthony J. Cauterucci, Director USAID/Honduras
	:	Copy to Gordon Straub, USAID/Honduras
	:	Copy to _____, LAC/DR
	:	Copy to IEE file

_____
Chief Environmental Officer
Bureau for Latin America and
the Caribbean

95

INITIAL ENVIRONMENT EXAMINATION

Project Location	:	Honduras
Project Title	:	Agricultural Research Foundation
Project Number	:	522-0249
Life of Project	:	10 years
IEE Prepared by	:	Gordon Straub, USAID/Honduras
Cleared by	:	Richard Dudley, RD Mission Environmental Officer
Date	:	Feb 14, 1984
Action Recommended	:	Negative Determination
Concurrence	:	Anthony J. Gaudiuccci, Mission Director Date: Feb 14, 1984

I. PROJECT DESCRIPTION

Project purpose is to expand and improve the agricultural research system to make it more responsive to technological needs of Honduran farmers. The strategy of the Project is to establish a private research foundation for effectively addressing research issues relating to production of food and export crops.

Environmental considerations directly associated with the Project mostly relate to future experimental activities designed for improving agricultural production. Technical assistance may also be provided to private sector in support of production and processing practices. In any event, the Project will stress the use of environmentally sound technologies.

On the issue of agricultural chemicals, the Project will encourage the use of non-chemical procedures to the extent possible. Any agricultural chemicals will be used primarily for experimental purposes and under the supervision of qualified and experienced professionals. In addition, recommendations derived from the Project will stress the use of adequate sampling and economic threshold levels, in order to assure the safest and most rational use of such products. Pesticide tolerances established by FAO for rates, frequency, and proper application of these chemicals will be used. The Mission will require that the Research Foundation obtain written approval from AID prior to purchases or use of pesticides. The Foundation may, however, request a waiver from AID to the effect of using acceptable products customarily applied in agricultural production.

Other environmental considerations anticipated include plant breeding and appropriate soil and water management, whose lack of negative environmental effects have been proven elsewhere.

II. PROJECT AREA

The Project will be implemented in Honduras, in areas that represent major agricultural regions of the country; such as: the humid tropical lowlands in north, the semi-arid intermontane zones in the south-central interior and the highlands in south-western Honduras. Temperatures range from about 10 degrees Centigrade in the mountains to about 35 degrees C. in the drier valleys of the interior. There is a distinct bimodal rainfall pattern with rains starting in May-June and ending November-December. The more humid northeastern region may have rainfall 9-10 months of the year. Soils present sandy clay to heavy clay textures, with depths varying from a few inches to several feet. Broadleaf, coniferous, and grasslands generally dominate the landscape.

III. DISCUSSION OF IMPACTS

A. Land Use

Most of the total crop production increase in Honduras results from bringing new lands into production, particularly as it relates to basic food crops. Productivity has remained stagnant, with low yields for most crops as the common denominator. Increasing population pressure on land has resulted in cultivation of mountain slopes with concomittant soil erosion and general degradation of the environment. This Project may help reverse this trend by supporting and promoting higher land productivity, the use of better and more desirable soil conservation practices and the identification of economic cropping practices better suited to prevailing terrains.

B. Water Quality

The expanding use of agricultural chemicals posess a direct threat to the intrinsic value of this resource. Unsafe use and inappropriate product choice may result in inadvertent contamination of different water sources. This Project will help alleviate the above situation by identifying and popularizing safer and environmentally more desirable agricultural practices. Genetic crop improvement for increased pest resistance, determination of economic threshold levels for agricultural chemical use, development of improved water management practices are examples of research endeavors with positive impacts on this matter.

D. Natural Resources

Deforestation of the Honduran countryside is taking place at a very rapid rate (estimated at 80,000 Ha per annum). This project will provide production alternatives that will minimize removal of vegetation or prolonged soil exposure. It will also enhance the use of economic species more fit to the prevailing environment (trees, cover crops, etc.).

G. Health

Increases in agricultural productivity will result in higher income and nutritional level of rural populations. Moreoever, increased availability of agricultural products will also benefit the urban sector. In addition, better and safer use of agricultural chemicals will also restrain possible hazzards in human food and water consumption. This Project will clearly have a positive impact on this issue.

H. Summary

The Project is anticipated to have little or moderate effect on the natural environment. Moreover, the foreseen changes will reverse or preclude damage to the environment and the population. On this basis, a negative determination is recommended.

IMPACT IDENTIFICATION AND EVALUATION FORM

Impact Areas and Sub-areas	Impact Identification and Evaluation 1/
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	N
2. Altering natural defenses	N
3. Foreclosing important uses	N
4. Jeopardizing man or his works	N
5. Other factors	N
Increasing Land Productivity	M+
B. WATER QUALITY	
1. Physical state of water	L
2. Chemical and biological states	L
3. Ecological balance	N
4. Other factors	

1/ We use the following symbols:

N = NO environmental impact
L = Little environmental impact
M = Moderate environmental impact
H = High environmental impact
U = Unknown environmental impact
+ = Beneficial impact
- = Negative impact

C. ATMOSPHERIC

1.	Air additives		N
2.	Air pollution		N
3.	Noise pollution		N
4.	Other factors		

D. NATURAL RESOURCES

1.	Diversion, altered use of water		N
2.	Irreversible, inefficient commitments		N
3.	Other factors		
	Deforestation		L+

E. CULTURAL

1.	Altering physical symbols		N
2.	Dilution of cultural traditions		N
3.	Other factors		

F. SOCIOECONOMIC

1.	Changes in economic/employment patterns		N
2.	Changes in population		N
3.	Changes in cultural pattern		N

4. Other factors

C. HEALTH

1. Changing a natural environment		N
2. Eliminating an ecosystem element		N
3. Other factors		
Provide more balanced nutrition		M+

I. OTHER POSSIBLE IMPACTS (not listed above)

1. Introduction of new plant species		M+
2. Agricultural chemicals		N
3. Other factors		N

I.E. Implementation Plan and Schedule

1. IMPLEMENTATION PLAN, 6/84 - 12/86

DATE	ADMINISTRATION
June, 1984	. President Suazo signs Personeria Juridica . Transitional phase begins. Provisional Board has first meeting.
July, 1984	. Worldwide search begins for Director General
Aug. 1984	. PP Approved . Project Authorization signed
Sep. 1984	. Project Agreement Signed . Begin preparation of PIO/T's and Bid Documents for TA
Oct. 1984	. Director General selected . Begin preparation of PIO/C's and Bid Documents for Commodities Contract (PSA)
Nov. 1984	. CP's Met . Issue PIO's and Bid Documents (TA & commodities)
Dec. 1984	. Permanent Board of Directors named

Jan.-March.1985

ADMINISTRATION

- Director General takes office Jan. 1st
- Screening of candidates for positions with FHIA
- Meet with GOH on importation and customs.
- Board meets on non-traditional crops. Decisions reached on some crops. Marketing and feasibility studies begun or waived.
- Land for FHIA research farm acquired
- Fund-raising strategy being developed and potential donors identified and approved.
  Begin technical and financial review and evaluation of BID Documents (responses).
- Project Liaison Officer begins work
- PSA contract negotiated and awarded

RESEARCH

- Selected research projects 50-90% staffed and functioning.
- Initiate station and field experiments on basic food crops.
- Visits to FHIA by CIMMYT and CIAT officials.
- Nurseries for perennial crops established
- Variety collections of perennial crops being developed
- Permanent plantings of tree crops for future research being established.

- Field work on production techniques, (fertilize use, weed control, disease/insect control, etc.), started on property of cooperating producers for both basic food and non-traditional crops.
- Banana breeding program provided with administrative support.

COMMUNICATIONS

- Communication and Development Division Director and Head of Library and Information Support Unit selected and in place.

TRAINING

- First training session for research assistants and extension workers held.

TECHNICAL SERVICES

- The work of this department continues without interruption as a carry-over from the previous ownership.

Apr.-Jun.1985

ADMINISTRATION

- Screening of candidates for FHIA positions continues.
- Board establishes provisional roster of crops to be dealt with during 1985. Marketing and feasibility studies carried out, or waived.
- Problems of importation and customs at least temporarily solved.
- Negotiate and award TA Contracts.
- Vehicles arrive (if award made in Feb.)

RESEARCH

- Selected research projects 90% staffed and functioning.
- Station and field experiments on basic food crops continues.
- CIMMYT and CIAT connections established. New planting materials begin to arrive.
- Establishment of permanent plantings of tree crops continues.
- Establishment of variety collections continues.
- Field work in production research on basic food crops and non-traditional crops in fields of cooperating producers continues.
- Work continues on banana breeding program with FHIA administrative support.

COMMUNICATIONS

- External and Internal Communication and Development Advisory Committees formed and have met.
- Communication Unit staffed and functioning.

TRAINING

- First training visits by FHIA personnel to IARC's.

TECHNICAL SERVICES

- Work of this department continues.

Jul.-Sept. 1985

ADMINISTRATION

- In depth studies on commodities under consideration by the board continues.
- Presentations to and from potential donors continues.
- Contacts and attendance at meetings with IARC's continues.
- DP/WP equip arrives (if award made in Feb.)
- TA teams arrive.

RESEARCH

- Selected research projects 100% staffed and functioning.
- Research on basic food crops continues at Foundation in collaboration with International Centers and MNR.
- Establishment of permanent plantings of tree crops continues. Field experiments being laid out.
- Field work in production research on basic food crops and non-traditional export crops continues on property of cooperating producers.
- Establishment of variety collections continues.
- Banana breeding research continues with administrative support by FHIA and financial support from FAO.

COMMUNICATIONS

- Training Unit and Development and Public Relation Unit Heads recruited and in place.
- Communication Unit staff selected for Academic training.

TRAINING

- Second training session for research assistants and extension personnel held.
- Training visists by FHIA personnel to IARC's continue. First candidates for advanced university training selected and depart.

TECHNICAL SERVICES

The routine work of this department continues.

Oct.-Dec. 1985

ADMINISTRATION

- Hiring of principal staff continues.
- Development activities continue.
- Contacts with donor institutions continue.
- Plans and constructions or renovations of training facilities begin.
- Review of administrative offices and organizational pattern begins.
- TA teams report on needed commodities and PSA begins procurement activities.

RESEARCH

- Field experiments on basic food crops continue.
- Establishment of permanent plantings of tree crops continues. Field trials continue.
- Establishment of variety collections continues.
- Field work in production research on basic food crops and non-traditional export crops continues on property of cooperating producers.
- Research on banana breeding continues.

COMMUNICATIONS

- Detailed work plan for 1986 submitted for review and approval.
- Communication Unit fully staffed.
- LOP implementation plan prepared by TA team in collaboration with C&D Division Director and MNR Communication Unit and submitted to USAID/H, AID/S&T, FHIA Executive Director and MNR for review and approval.

TRAINING

- Third training session for research and extension personnel.

TECHNICAL SERVICES

- Routine work of the department continues.
- TA team finish study (equipment needs) and submit report.

Jan.-Jun. 1986

ADMINISTRATION

- Screening of candidates for FHIA Posts continues.
- Board meets to consider additional crops for research. In depth marketing and feasibility studies carried out or waived.
- Meet with GOH to review advance system with view of making system secure yet agile.
- Commodities and equipment procured by PSA (lab equipment) arrives as well as communications equipment procured under TA contract.

RESEARCH

- Selected research projects fully staffed and operational.
- Permanent plantings of tree crops fully established. Field trials fully established.
- Work continues on basic food crops. First research results being analysed.
- Establishment of variety collections continues.
- Field work in production research in basic food crops and non-traditional export crops continues in fields of cooperating producers. First results of research in both these areas being analysed and prepared for release.
- Banana breeding research continues.

COMMUNICATIONS

- First annual report of progress and revisions in implementation plan submitted for review and approval.

TRAINING

- Fourth and fifth training sessions for research and extension personnel.
- Training visits by FHIA personnel to IARC's continue. Additional candidates for advanced university training being selected.

TECHNICAL SERVICES

- Routine work continues.

Jul.-Dec. 1986

ADMINISTRATION

- Review of administrative offices for efficiency, performance, and adequacy.
- Review of computer system for capacity, accuracy and cost.
- Review of Research Program for appropriateness and efficiency.

RESEARCH

- Permanent plantings of tree crops fully established and experiments under way.
- Variety collection well established and collection activities continuing.
- Work continues on basic food crop research.
- Field work in production research in basic food crops and non-traditional export crops continues in fields of cooperating producers.
- Work on banana breeding continues.
- First complete reports of FHIA research, containing analysed results of field experiments of work done on FHIA land and on the farms of cooperating producers are being prepared for release. This will also include a progress report on the banana breeding program. Field Days and Farmers' meetings are being organized. Leaflets are being printed and radio programs taped by the Communications Unit.

TRAINING

- Sixth and seventh training sessions for research and extension personnel held.
- Training visits by FHIA personnel to IARC's.
- Candidates for advanced university training depart.

TECHNICAL SERVICES

- Normal work continues and picks up in volume.

2. PROCUREMENT PLAN (TA & COMMODITIES)

Aug. '84	. PP Approved
	. Project Authorization signed
Sept. '84	. Pro. Ag. signed
	. Prepare 3 PIO/T's for TA
	. Prepare RFP, RFTP & Scope of Work for the 3 TA activities
	. Scope of Work, etc. for Project Liaison Officer (PSC)
	. RFTP for TA in Administration, Research and Technical Service (Educ. Selection)
	. RFP for TA in Communications (thru S&T/ED centrally funded project) (to be prepared by AID/W)
Oct. '84	. Prepare PIO/C's for Commodities
	. Prepare IFB's for Commodities contract (PSA)

(Note: Procurement of Communication & other equip will be written into Communication RFP. All other commodities will be procured by PSA.)

Nov. '84	. CP's met
	. Issue PIO/T's & PIO/C's
	. Issue Bid Docuements for TA and Commodities (RFTP, RFP, Scope of Work and IFB's).

(Note: During this 2 month period advertisement occurs, interested parties receive and respond to Bid Documents, Technical and other evaluation teams form, etc.)

Feb. '85	. Begin technical and financial review and evaluation of responses to BID Documents for commodities (and possible award for Project Liaison Slot and PSA Contract).
Mar. '85	. Project Liaison Officer or Board
Apr./May' 85	. Negotiate and Award TA contracts.
June '85 or July '85	. Vehicles should arrive (if award made in Feb).
	. DP/WP equip should arrive (if award made in Feb.)
	. TA teams arrive.
Nov. '85	. TA team for Communications begins procurement of commodities and equip per contract.
Jun. '86	. Communications/other equip begins to arrive.

3. Technical Assistance Schedule

	Technical Assistance Person-Months									
	1985	1986	1987	1988	1989	1990	1991	1992	1993	TOTAL
I. Project Liaison Officer	12	12	12							36
Sub-Total	12	12	12							
II. Administration										
1. Financial System	6	3								9
2. Computerizing System	3	3								6
3. Farm Layout	6	6		2						14
4. Administrative Support	3	3								6
Retirement System perquisites, etc.										
5. Architects for Refurnishing	3	3								6
Planners for new station		6								6
6. Planning Sewerage	3	2								5
7. Planning Drainage & Irrigation	1	3	3							7
Sub-Total	25	29	3	2	-	-	-	-	- -	95
III. Research Programs										
In-Depth Studies										
1. Citrus	12	4	3		5					24
2. Cacao		12	3		3					18
3. Spices, Petevalle Palm, etc.			6	3						9
4. Vegetables	6	6	6							18
5. Exploratory operation			12	12	12					36
6. Other Crops		3	3	6	6					18
Sub-Total	18	25	33	21	26		-	-	-	123

Cont'd

	Technical Assistance Person-Months									
	1985	1986	1987	1988	1989	1990	1991	1992	1993	TOTAL
IV. Communications/Development										
1. Sr. Agricultural Comm. Spec.	12	12	12							36
2. Development/Fund Raising Spec.	12	12								24
3. Evaluation Specialist		4	2							6
4. Radio and other Audio Spec.		4	2							6
5. Graphic Arts Specialist		3	1							4
6. Print Media Specialist		3	1							4
7. Video Production Specialist			3							3
8. Communication Hardware Spec.	1									1
9. Training Specialist		3	3							6
10. Information System Spec.		1	3							4
Sub-Total		43	39	12						94
V. Technical Analysis Services										
1. Revision of Labs	6	3								9
2. Revision of Equipment	2									2
3. Training of Repair Personnel	1	1								2
4. Supervision of Repair	4	4								8
Sub-Total	13	8								21

Summary Budget for Technical Assistance* (US$000)										TOTAL
I Project Liaison Officer	125	125	125							375
II Administration	275	319	33	22						649
III Research Program	198	242	132		187	233	100	100	31	1,223
IV Communications/Development	459	415	191							1,065
V Technical Analysis Services	143	88								231
TOTAL	1,200	1,189	481	22	187	233	100	100	31	3,543

*Calculated at $125,000 per year of long term T.A. and $11,000 per month of Short term T.A.

4. Equipment Needs

A. Research Equipment and Office Furniture

Item	Quantity	Est. Unit Cost ($000)	Total
1. Switchboard Plant	1	10,000	10,000
2. Electronic Composer (Word Processor)	2	3,500	7,000
3. Metalic Cabinets, 4 drawers	15	300	4,500
4. Metalic Shelves	4	7,000	2,800
5. Electric Typewriter	6	1,000	6,000
6. Map Cabinets	4	9,000	3,600
7. Electric Wall Clock	3	100	300
8. Desk Calculator	6	200	1,200
9. Binder	1	200	200
10. Gas Chamatography (pesticide residue analysis)	1 set	90,000	90,000
11. Compound Microscope	1 set	8,000	8,000
12. Compound Microscope	4	1,200	4,800
13. Disecting Scope	4	800	3,200
14. Incubator	4	2,000	8,000
15. Refrigerator	4	600	2,400
16. Centrifuge	1	500	500
17. Scale (Analytical)	2	2,000	4,000
18. Scale (Triple Beam)	4	200	800
19. Stir Plate	4	200	800
20. Colony Counter	2	300	600
21. Oxfor Pipet Machine	1	400	400
22. Desk Calculator with Printer	2	500	1,000
23. Higrotermograph	4	700	2,800
24. Colorimeter	2	600	1,200
25. Ph Meter	2	400	800
26. Lab Cart	2	200	400
27. Optical Planimeter	1	100	100
28. Lab Chairs	6	200	1,200
29. Bicycle	1	300	300
30. Air Compressor	1	3,000	3,000
31. Water Distiller Unit	1	1,500	1,500
32. Weather Station Equipment	2 sets	1,500	3,000
33. Atomic Absorption Unit	1	25,000	25,000
34. Spectrophotometer	1	6,000	6,000
35. High Speed Centrifuge	1	6,000	6,000
36. Controlled Environment Chamber	1	7,500	7,500
37. Gas Exchange Unit	1	2,000	2,000
38. Fume Hood	1	2,500	2,500
39. Mycological Herbarium Unit	1	4,580	4,580
40. Miscellaneous Equipment			72,020
41. Replacement of Present Equipment			100,000
TOTAL			400,000

Cont'd

B. Communication Equipment

Equipment	Est. Unit Cost $
Electric typewriter - IBM Selectric III	945
Manual typewriter - Facit manual	425
Electronic composer (Word processor)	3,500
5150174PC, with 64K Ram, 2 disk drives (360 KB), serial interface keyboard;	
1504900 Monitor, Printer, adapter interface for IBM-E200D;	
5151001 Monochrome Display, green phosphor;	
6024120 Program, DOS 2.1 (Disk Operating system);	
CLND-C1234 memory chips. (Each chip adds an extra 64K--should have 3 for each PC);	
Cables for printers;	
5152002 printer with graphics;	
Photocopier - Xerox 1035	5,000
Mimeograph - A. B. Dick 565	2,000
Electronic stencil cutter - Electro Stencil 592	1,450
Audio studio	
Atari 5050 B reel-to-reel recorder 6,000	
TEAC Model 2 mixer	
Technics SL 1200 turntable	
Slatton 680 EL cartridge	
Electro Voice EV 635A microphone	
AKG mike stands model 201	
Cabeling setup	
Robbins bulk tape eraser	
EV Century mono speaker	
AKG K-141 headset	
Morantz PMD 220 cassette recorder	
Hitachi AVA-150	
Maxell UDXL2 C-90 cassette tapes	
Ampex 406 1/4 x 2000 pancake reel tape (10 pancakes)	
180 plastic reels and boxes	
Editall editing bars	
Splicing tape	
Head cleaner and cotton swabs	
Miscellaneous	
Basic video unit - only to supplement existing equipment	1,000

Cont'd

Graphic arts setup (for each setup)	2,000
Rapid-a-graph set No. 3165-JSP-6	
Leroy lettering set	
Letraset letters	
Paper, ink, paints, etc.	
Drawing table, 100 x 150 cm., Nanny Architetto	
Stool, Dick Blick - Combo Lamp	
Small light table, Dick Blick - Litebox	
Supplies, T-square, rulers, etc.	
Other graphic arts (one set only)	1,000
Large storage unit - Director, 23 x 60 x 20	
Wall bench unit - Dick Blick, 6' x 24" x 26 1/2"	
Flat files, 5 drawer - Foster	
Paper cutter	
Photography, photo laboratory - only to supplement existing equipment	1,000
Offset print shop	65,000
Multilith 1360 CD press	
Electrostat plate maker, A. B. Dick	
3/4" stitcher	
Large saddle stitcher	
Small saddle stitcher - electric stapler	
Drill, 3 spindle - Challenge EH&A	
Table top folder - Challenge O&M	
Power paper cutter - Challenge 305	
Collater - GBC	
Printing supplies, ink, etc.	
Hot glue binder - ARMARCO Bind-o-Mat 200	
Small manual paper cutter	
Light table, Simco Lectro Electrostatic	
Other accessories as required	
Silkscreen facility	3,000
Supplies, Ulano, Nas Dar, ink, film, etc.	
Wood frames and screen, 4 different sizes	
Squeegees, set of 4 sizes to 18 x 30"	
Offset silkscreen exposing unit, Atlas	

Cont'd

Microcomputer, with peripherals	9,000
5160087 PC-XT, 128K Ram, expandable to 256 K IBM-B247U, 1 disk drive (360 KB) 10 MEG hard disk and serial interface;	
1501002 Co-processor, 8087 Math option (need for each SPSS package);	
1504900 Monitor, color, graphics, adaptor interface;	
1505200 Printer adaptor, Centronics parallel;	
1502074 serial interface, RS-232;	
NEC 3550 printer;	
6024120 program, DOS 2.1;	
CLND-C1234 memory chips (each chip adds an extra 64K--should have 3 fro each PC and 2 for each XT);	
SPSS corporation - SPSS for IBM PC;	
Cables for printers;	
Lotus 123 with symphony	
Desk Calculator - Sanyo 5000 or equivalent	150
Misc. cables, connections, etc.	1,000
A/V equipment	
Slide projector - Kodak AF2 with case	350
Overhead projector - 3M model 213 AKD	660
Opaque projector - Beseler Vulyte IV, model 12400	740
Filmstrip projector - AV Concepts Corp. SFS-500 RCN with case	230
Portable projection screen - Da-Lite Vidio Halo 60 x 60"	120
16mm movie projector - Kodak Ektagraphic CT1000	1,250
Portable audio cassette recorder - Morantz PMD-220	160
Video cassette player - Panasonic NV 8100	750
TV color monitor	500
Portable public address system - Porta Sound Lectern Model 231	550
<u>Vehicle</u>	
12-passenger minibus	12,000
8-passenger minibus	10,500
Wagoneer/Blazer type	10,500
TOTAL	140,230

ANNEX II

LEGAL EXHIBITS

ANNEX II
Exhibit A

CERTIFICATION PURSUANT TO SECTION 611(e) OF THE FOREIGN ASSISTANCE ACT OF 1961, AS AMENDED

I, Anthony J. Cauterucci, the principal officer of the Agency for International Development in Honduras, having taken into account among other factors the maintenance and utilization of projects in Honduras previously financed or assisted by the United States, do hereby certify that in my judgement Honduras has both the financial capability and the human resources capability to effectively maintain and utilize the capital assistance project: AGRICULTURAL RESEARCH FOUNDATION.

This judgement is based upon the implementation record of the previous projects implemented in Honduras, and the quality of the planning which has gone into this new project.

Anthony J. Cauterucci
Director, USAID/Honduras

Date: August 6, 1984

PROJECT AUTHORIZATION

Name of Country	:	Honduras
Name of Project	:	Agricultural Research Foundation
Number of Project	:	522-0249

1. Pursuant to Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize the Agricultural Research Foundation Project for Honduras (the "Cooperating Country") involving planned obligations of not to exceed TWENTY MILLION UNITED STATES DOLLARS (US$20,000,000) in Grant funds over a ten year period from the date of authorization, subject to the availability of funds in accordance with the A.I.D./OYB allowance process, to help in financing foreign currency and local currency costs for the Project.

2. The Project ("Project") will establish a private, independent institution, the Honduran Agricultural Research Foundation, which will expand and improve the agricultural research system in Honduras and enable it to be more responsive to the technological needs of farmers, particularly those producing non-traditional crops for export.

3. The Project Agreement, which may be negotiated and executed by the offices to whom such authority is delegated in accordance with A.I.D. regulations and Delegations of Authority, shall be subject to the following terms and essential covenants and major conditions, together with other terms and conditions as A.I.D. may deem appropriate.

A. Source and Origin of Commodities, Nationality of Services

Commodities financed by A.I.D. under the Grant shall have their source and origin in countries which are members of the Central American Common Market or in the United States, except as A.I.D. may otherwise agree in writing. Except for ocean shipping, the suppliers of commodities or services shall have countries which are members of the Central American Common Market or the United States as their place of nationality, except as A.I.D. may otherwise agree in writing. Ocean shipping financed by A.I.D. under the Grant shall be financed only on flag vessels of the United States, except as A.I.D. may otherwise agree in writing.

B. Conditions Precedent

(1) Prior to any disbursement of funds, or the issuance of any commitment documents under the Project Agreement pursuant to which disbursement will be made, except for the Procurement of foreign technical assistance, the Foundation shall, except as A.I.D. may otherwise agree to in writing, submit evidence that the Foundation has established a financial/accounting system acceptable to A.I.D.

(2) Prior to any disbursement for specific research in basic food crops (corn, beans, sorghum and rice), the Foundation will cause to be provided to A.I.D., in form and substance satisfactory to A.I.D., an implementation agreement between the Foundation and the Honduran Ministry of Natural Resources which specifies the responsibilities of each entity for basic grains research under the Project and how over-all agricultural research in Honduras will be coordinated between the entities.

(3) Prior to any disbursement of funds for any individual research program, the Foundation shall, except as AID may otherwise agree in writing, furnish to AID, in form and substance satisfactory to AID, evidence that the Foundation has adquired a sufficient quantity of suitable land and the necessary financial resources to effectively carry out the program.

C. Covenants

The Government of Honduras will be a party to the Project Agreement. As such, the GOH shall covenant that, unless AID otherwise agrees in writing, it will:

(1) Maintain the status which provides FHIA with exemption from taxes, tariffs and any other surcharges on the import of equipment and supplies and on salaries, household effects, vehicles and other effects of FHIA's international staff.

(2) Maintain budgetary and other support for FHIA operation for a period of ten years, including assistance in the provision of present and future land requirements.

5C(1) - COUNTRY CHECKLIST

Listed below are statutory criteria applicable generally to FAA funds, and criteria applicable to individual fund sources: Development Assistance and Economic Support Fund.

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA Sec. 481; FY 1984 Continuing Resolution. Has it been determined or certified to the Congress by the President that the government has failed to take adequate measures or steps to prevent narcotic and psychotropic drugs or other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention control Act of 1971) which are cultivated, produced or processed illicitly, in whole or in part, in such country or transported through such country, from being sold illegally within the jurisdiction of such country, to Unites States government personnel or their dependents or from entering the United States unlawfully?

2. FAA Sec. 620(c). If assistance is to a government, is the government liable as debtor or unconditional guarantor on any debt to a U.S. citizen for goods or services furnished or ordered where (a) such citizen has exhausted available legal remedies and (b) the debt is not denied or contested by such government?

5C(1) - COUNTRY CHECKLIST

A. GENERAL CRITERIA FOR COUNTRY ELIGIBILITY

1. FAA SEC. 481; FY 1984 Continuing Resolution. No such determination has been made.

2. FAA Sec. 620 (c)
The GOH is not liable as a debtor under these conditions.

3. FAA Sec. 620(e)(1). If assistance is to a government, has it (including government agencies or subdivisions) taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking steps to discharge its obligations toward such citizens or entities?

3. FAA Sec. 620(e)(1).
There is no evidence of such action.

4. FAA Sec. 532(c), 520(a) 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513. Is recipient country a Communist country? Will assistance be provided to Angola, Cambodia, Cuba, Laos, Vietnam, Syria, Libya, Iraq, or South Yemen? Will assistance be provide to Afghanistan or Mozambique without a waiver?

4. FAA Sec. 532(c), 520(a) 620(f), 620D; FY 1982 Appropriation Act Secs. 512 and 513.
No

5. ISDCA of 1981 Secs. 724, 727 and 730. For specific restrictions on assistance to Nicaragua, see Sec. 724 of the ISDCA of 1981. For specific restrictions on assistance to El Salvador, see Secs. 727 and 730 of the ISDCA of 1981.

5. ISDCA of 1981 Secs. 724, 727 and 730.
N/A

6. FAA Sec. 620 (j). Has the country permitted, or failed to take adequate measures to prevent, the damage or destruction by mob action of U.S. property?

6. FAA Sec. 620 (j).
In the past there have been incident where the GOH was unsuccessful in containing demonstrations against the U.S. Embassy; but this has not been the care for over fourteen years.

7. FAA Sec. 620(1). Has the country failed to enter into an agreement with OPIC?

7. FAA Sec. 620(1).
The OPIC Investment Warranty Program is in effect in Honduras.

8. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5. (a) Has the country seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters?

(b) If so, has any deduction required by the Fishermen's Protective Act been made?

8. FAA Sec. 620(o); Fishermen's Protective Act of 1967, as amended, Sec. 5.
(a) Honduras has not seized or imposed penalties or sanctions against U.S. fishing activities.

(b) N/A

9. FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517. (a) Has the government of the recipient country been in default for more than six months on interest or principal of any A.I.D. loan to the country? (b) Has the country been in default for more than one year on interest or principal on any U.S. loan under a program for which the appropriation bill appropriates funds?

9. FAA Sec. 620(q); FY 1982 Appropriation Act Sec. 517.
(a) No

(b) No

10. FAA Sec 620(s). If contemplated assistance is development loan or from Economic Support Fund, has the Administrator taken into account the amount of foreign exchange or other resources which the country has spent on military equipment? (Reference may be to the annual "Taking into Consideration" memo: "Yes, taken into account by the Administrator at time of approval of Agency OYB." This approval by the Administrator of the Operational Year Budget can be the basis for an affirmative answer during the fiscal year unless significant changes in circumstances occur.)

10. FAA Sec 620(s).
Yes, taken into account by the Administrator at time of approval of Agency OYB.

11. FAA Sec. 620(t). Has the country severed diplomatic relations with the United States? If so, have they been resumed and have new bilateral assistance agreements been negotiated and entered into since such resumption?

11. FAA Sec. 620(t).
No.

12. FAA Sec. 620(u). What is the payment status of the country's U.N. obligations? If the country is in arrears, were such arrearages taken into account by the A.I.D. Administrator in determining the current A.I.D. Operational Year Budget? (Reference may be made to the Taking into Consideration memo.)

12. FAA Sec. 620(u).
Honduras is not in arrears to the extent described in Article 19 of the U.N. Charter. This was taken into account by the Administrator at the time of approval of the Agency OYB.

13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520. Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed an act of international terrorism? Has the country aided or abetted, by granting sanctuary from prosecution to, any individual or group which has committed a war crime?

13. FAA Sec. 620A; FY 1982 Appropriation Act Sec. 520.
No.

14. FAA Sec. 666. Does the country object, on the basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. who is present in such country to carry out economic development programs under the FAA?

14. FAA Sec. 666.
No.

15. FAA Sec. 669, 670. Has the country, after August 3, 1977, delivered or received nuclear enrichment or reprocessing, equipment, materials, or technology, without specified arrangements or safeguards? Has it transferred a nuclear explosive device to a non-nuclear weapon state, or if such a state, either received or detonated a nuclear explosive device, after August 3, 1977? (FAA Sec. 620E permits a special waiver of Sec. 669 for Pakistan.)

15. FAA Sec. 669, 670.
No.

16. ISDCA of 1981 Sec. 720. Was the country represented at the Meeting of Ministers of Foreign Affairs and Heads of Delegations of the Non-Aligned Countries to the 36th General Session of the General Assembly of the U.N. of Sept. 25 and 28, 1981, and failed to disassociate itself from the communique issued? If so, has the President taken it into account? (Reference may be made to the Taking into Consideration memo.)

16. ISDCA of 1981 Sec. 720.
This has been taken into consideration by the Administrator at the time of approval of the Agency OYB.

17. ISDCA of 1981 Sec. 721. See special requirements for assistance to Haiti.

17. ISDCA of 1981 Sec. 721.
N/A

18. FY 1984 Continuing Resolution. Has the recipient country been determined by the President to have engaged in a consistent pattern of opposition to the foreign policy of the United States?

18. FY 1984 Continuing Resolution.
No such determination has been made.

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. FAA Sec. 116. Has the Department of State determined that this government has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, can it be demonstrated that contemplated assistance will directly benefit the needy?

2. Economic Support Fund Country Criteria

a. FAA Sec. 502B. Has it been determined that the country has engaged in a consistent pattern of gross violations of internationally recognized human rights? If so, has the country made such significant improvement in its human rights record that furnishing such assistance is in the national interest?

b. ISDCA of 1981, Ec. 725(b). If ESF is to be furnished to Argentina, has the President certified that (1) the Govt. of Argentina has made significant progress in human rights; and (2) that the provision of such assistance is in the national interests of the U.S.?

c. ISDCA of 1981, Sec. 726(b). If ESF assistance is to be furnished to Chile, has the President certified that (1) the Govt. of Chile has made

B. FUNDING SOURCE CRITERIA FOR COUNTRY ELIGIBILITY

1. Development Assistance Country Criteria.

a. FAA Sec. 116.
The Department of State has not determined that Honduras violates human rights.

2. Economic Support Fund Country Criteria

a. FAA Sec 502B.
N/A

b. ISDCA of 1981, EC. 725(b).
N/A

c. ISDCA of 1981, Sec. 726(b).
N/A

125

significant progress in human rights; (2) it is in the national interest of the U.S.; and (3) the Govt. of Chile is not aiding international terrorism and has taken steps to bring to justice those indicted in connection with the murder of Orlando Letelier?

5C(2) PROJECT CHECKLIST

Listed below are statutory criteria applicable to projects. This section is divided into two parts. Part A includes Criteria applicable to all projects. Part B applies to projects funded from specific sources only: B.1. applies to all projects funded with Development Assistance Funds, B.2. applies to projects funded with Development Assistance loans, and B.3. applies to projects funded from ESF.

CROSS REFERENCES: IS COUNTRY CHECKLIST UP TO DATE? HAS STANDARD ITEM CHECKLIST BEEN REVIEWED FOR THIS PROJECT?

A. GENERAL CRITERIA FOR PROJECT

CR Sec. 133. Notwithstanding any other provision of this joint resolution, none of the funds appropriate under section 101 (b) of this joint resolution may be available for any country during any 3-month period beginning on or after October 1, 1982, immediately following the certification of the President to the Congress that such country is not taking adequate steps to cooperate with the United States to prevent narcotic drugs and other controlled substances (as listed in the schedules in section 202 of the Comprehensive Drug Abuse and Prevention Control Act of 1971 (21 U.S.C. 812)) which are produced, processed, or transported in such country from entering the Unites States unlawfully."

A. GENERAL CRITERIA FOR PROJECT

1. FY 1982 Appropriate Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a) Describe how authorizing and appropriations committees of Senate and House have been or will be notified concerning the project; (b) is assistance within (Operational Year Budget) country or international organization allocation reported to Congress (or not more than $1 million oer that amount)?

1. FY 1982 Appropriate Act Sec. 523; FAA Sec. 634A; Sec. 653(b).

(a) Congress has been informed of AID's intention to obligate funds via the congressional notification process.

(b) Yes.

2. FAA Sec. 611 (a) (1). Prior to obligation in excess of $100,00, will there be (a) engineering, financial or other plans necessary to carry out the assistance and (b) a reasonably firm estimated of the cost to the U.S. of the assistance?

2. FAA Sec. 611 (a) (1).

(a) Yes

(b) Yes

3. FAA Sec. 611 (a) (2). If further legislative action is required within recipient country, what is basis for reasonable expectation that such action will be completed in time to permit orderly accomplishment of purpose of the assistance?

3. FAA Sec. 611 (a) (2).

No further legislation action is required Honduras law for grant financing.

4. FAA Sec. 611 (b); FY 1982 Appropriation Act Sec. 501. If for water or water-related land resource construction, has project met the standards and criteria as set forth in the Principles and Standards for Planning Water and Related Land Resources, dated October 25, 1973? (See A.I.D. Handbook 3 for new guidelines.)

4. FAA Sec. 611 (b); FY 1982 Appropriation Act Sec. 501.

No water or water-related land resource construction is anticipated under this project.

128

5. FAA Sec. 611(e). If project is capital assistance (e.g., construction), and all U.S. assistance for it will exceed $1 million, has Mission Director certified and Regional Assistant Administrator taken into consideration the country's capability effectively to maintain and utilize the project?

5. FAA Sec. 611(e).

611(e) certification is attached.

6. FAA Sec. 209. Is project susceptible to execution as part of regional or multilateral project? If so, why is project not so executed? Information and conclusion whether assistance will encourage regional development programs.

6. FAA Sec. 209. Project activities are not appropriate for a regional project because the project is designed to provide the link between international and regional research centers and specific research needs of Honduras. For that reason project is not appropriate for a execution as a regional project.

7. FAA Sec. 601(a). Information and conclusions whether project will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; and (c) encourage development and use of cooperatives, and credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture and commerce; and (f) strengthen free labor unions.

7. FAA Sec. 601(a).

The purpose of this project is to increase technical efficiency of Honduran agriculture, particulary in the production of non-traditional export crops. In this sense, it is anticipated that the project will impact positively on an increase on the flow of international trade.

8. FAA Sec. 601(b). Information and conclusions on how project will encourage U.S. private trade and investment abroad and encourage private U.S. participation in foreign assistance programs (including use of private trade channels and the services of U.S. private enterprise.)

8. FAA Sec. 601(b).

All technical assistance procured under the project will be provided by U.S. sources.

9. FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507. Describe steps taken to assure that, to the maximum extent possible, the country is contributing local currencies to meet the cost of contractual and other services, and foreign currencies owned by the U.S. are utilized in lieu of dollars.

9. FAA Sec. 612(b), 636(h); FY 1982 Appropriation Act Sec. 507.

Honduras has agreed to provide counterpart financing of local costs to the extent possible.

10. FAA Sec. 612(d). Does the U.S. own excess foreign currency of the country and, if so, what arrangements have been made for its release?

10. FAA Sec. 612(d).

No.

11. FAA Sec. 601(e). Will the project utilize competitive selection procedures for the awarding of contracts, except where applicable procurement rules allow otherwise?

11. FAA Sec. 601(e).

Yes.

12. FY 1982 Appropriation Act Sec. 521. If assistance is for the production of any commodity for export, is the commodity likely to be in surplus on world markets at the time the resulting productive capacity becomes operative, and is such assistance likely to cause substantial injury to U.S. producers of the same, similar or competing commodity?

12. FY 1982 Appropriation Act Sec. 521.

No.

13. Faa 118(c) and (d). Does the project comply with the environmental procedures set forth in A.I.D. Regulation 16? Does the project or program take into consideration the problem of the destruction of tropical forests?

13. FAA 118(c) and (d).

Yes.

130

14. FAA 121(d). If a Sahel project, has a determination been made that the host government has an adequate system for accounting for and controlling receipt and expenditures of project funds (dollars or local currency generated therefrom)?

14. FAA 121(d).

N/A

FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria.

a. FAA Sec. 102(b), 111, 113, 281(a). Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production and the use of appropriate technology, spreading investment out from cities to small towns and rural areas, and insuring wide participation of the poor in the benefits of development on a sustained basis, using the appropriate U.S. institutions; (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward a better life, and otherwise encourage democratic private and local governmental institutions; (c) support the self-help efforts of developing countries; (d) promote the participation of women in the national economies of developing countries and the improvement of women's status; and (e) utilize and encourage regional cooperation by developing countries?

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria.

a. FAA Sec. 102(b), 111, 113, 281(a).

The project will actively involve the rural poor by providing to small and cooperative farmers access to labor intensive and appropriate technologies.

b. FAA Sec. 103, 103A, 104, 105, 106. Does the project fit the criteria for the type of funds (functional account) being used?

b. FAA Sec. 103, 103A, 104, 105, 106.

Yes.

c. FAA Sec. 107. Is emphasis on use of appropriate technology (relatively smaller, cost-saving, labor-using technologies that are generally most appropriate for the small farms, small businesses, and small incomes of the poor)?

c. FAA Sec. 107.

Yes.

d. FAA Sec. 110(a). Will the recipient country provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or is the latter cost-sharing requirement being waived for a "relatively least developed" country)?

d. FAA Sec. 110(a).

Yes, the recipient country will provide at least 25% of the project costs.

e. FAA Sec. 110(b). Will grant capital assistance be disbursed for project over more than 3 years? If so, has justification satisfactory to Congress been made, and efforts for other financing, or is the recipient country "relatively least developed"? (M.O. 1232.1 defined capital project as "the construction, expansion, equipping or alteration of a physical facility or facilities financed by A.I.D. dollar assistance of not less than $100,000, including related advisory, managerial and training services, and not undertaken as part of a p oject of a predominantly technical assistance character."

e. FAA Sec. 110(b).

It is anticipated that incremental funding for this project will be provided in such a way that disbursement will take place within a three-year period from date of obligation.

f. FAA Sec. 122(b). Does the activity give reasonable promise of contributing to the development of economic resources, or to the increase of productive capacities and self-sustaining economic growth?

f. FAA Sec. 122(b).

Yes.

g. FAA Sec. 281(b). Describe extent to which program recognizes the particular needs, desires, and capacities of the people of the country; utilizes the country's intellectual resources to encourage institutional development; and supports civil education and training in skills required for effective participation in governmental processes essential to self-government.

g. FAA Sec. 281(b).

This project is a major institution building effort which will mobilize local intellectual and financial resources.

Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b). Information and conclusion on capacity of the country to repay the loan, at a reasonable rate of interest.

b. FAA Sec. 620(d). If assistance is for any productive enterprise which will compete with U.S. enterprises, is there an agreement by the recipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan?

c. ISDCA of 1981, Sec. 724(c) and (d). If for Nicaragua, does the loan agreement require that the funds be used to the maximum

2. Development Assistance Project Criteria (Loans Only)

a. FAA Sec. 122(b).

N/A

b. FAA Sec. 620(d).

N/A

c. ISDCA of 1981, Sec. 724(c) and (d).

N/A

extent possible for the private sector? Does the project provide for monitoring under FAA Sec. 624(g)?

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a). Will this assistance promote economic or political stability? To the extent possible, does it reflect the policy directions of FAA Section 102?

b. FAA Sec. 531(c). Will assistance under this chapter be used for military, or paramilitary activities?

c. FAA Sec. 534. Will ESF funds be used to finance the construction of the operation or maintenance of, or the supplying of fuel for, a nuclear facility? If so, has the President certified that such use of funds is indispensable to nonproliferation objectives?

d. FAA Sec. 609. If commodities are to be granted so that sale proceeds will accrue to the recipient country, have Special Account (counterpart) arrangements been made?

3. Economic Support Fund Project Criteria

a. FAA Sec. 531(a).

N/A

b. FAA Sec. 531(c).

N/A

c. FAA Sec. 534.

N/A

d. FAA Sec. 609.

N/A

5C(3) - STANDARD ITEM CHECKLIST

Listed below are the statutory items which normally will be covered routinely in those provisions of an assistance agreement dealing with its implementation, or covered in the agreement by imposing limits on certain uses of funds.

These items are arranged under the general headings of (A) Procurement, (B) Construction, and (C) Other Restrictions.

A. PROCUREMENT

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishing of commodities and services financed?

2. FAA Sec. 604(a). Will all procurement be from the U.S. except as otherwise determined by the President or under delegation from him?

3. FAA Sec. 604(d). If the cooperating country discriminates against marine insurance companies authorized to do business in the U.S., will commodities be insured in the United States against marine risk with such a company?

4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a). If offshore procurement of agricultural commodity or product is to be financed, is there provision against such procurement when the domestic price of such commodity is less than parity? (Exception where commodity financed could not reasona ly be procured in U.S.)

A. PROCUREMENT

1. FAA Sec. 602.

Yes.

2. FAA Sec. 604(a).

Yes.

3. FAA Sec. 604(d).

Honduras does not practice such discrimination.

4. FAA Sec. 604(e); ISDCA of 1980 Sec. 705(a).

N/A

5. FAA Sec. 604(g). Will construction or engineering services be procured from firms of countries otherwise eligible under Code 941, but which have attained a competitive capability in international markets in one or more of these areas?

5. FAA Sec. 604(g).

N/A

6. FAA Sec. 603. Is the shipping excluded from compliance with requirements in section 901(b) of the Merchant Marine Act of 1936, as amended, that at least 50 per centum of the gross tonnage of commodities (computed separately for dry bulk carriers, dry cargo liners, and tankers) financed shall be transported on privately owned U.S. flag commercial vessels to the extent that such vessels are available at fair and reasonable rates?

6. FAA Sec. 603.

No.

7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished by private enterprise on a contract basis to the fullest extent practicable? If the facilities of other Federal agencies will be utilized, are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

7. FAA Sec. 621.

Yes.

8. International Air Transport. Fair Competitive Practices Act, 1974. If air transportation of persons or property is financed on grant basis, will U.S. carriers be used to the extent such service is available?

8. International Air Transport. Fair Competitive Practices Act, 1974.

Yes.

136

9. FY 1982 Appropriation Act Sec. 504. If the U.S. Government is a party to a contract for procurement, does the contract contain a provision authorizing termination of such contract for the convenience of the United States?

9. FY 1982 Appropriation Act Sec. 504.

Yes.

B. Construction

1. FAA Sec. 601(d). If capital (e.g., construction) project, will U.S. engineering and professional services be used?

1. FAA Sec. 601(d).

N/A

2. FAA Sec. 611(c). If contracts for construction are to be financed, will they be let on a competitive basis to maximum extent practicable?

2. FAA Sec. 611(c).

Yes.

3. FAA Sec. 620(k). If for construction of productive enterprise, will aggregate value of assistance to be furnished by the U.S. not exceed $100 million (except for productive enterprises in Egypt that were described in the CP)?

3. FAA Sec. 620(k).

Yes.

C. Other Restrictions

1. FAA Sec. 122(b). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

1. FAA Sec. 122(b).

N/A

2. FAA Sec. 301(d). If fund is established solely by U.S. contributions and administered by an international organization, does Comptroller General have audit rights?

2. FAA Sec. 301(d).

N/A

137

3. FAA Sec. 620(h). Do arrangements exists to insure that United States foreign aid is not used in a manner which, contrary to the best interests of the United States, promotes or assists the foreign aid projects or activities of the Communist-bloc countries?

3. FAA Sec. 620(h).

Yes.

4. Will arrangements preclude use of financing:

a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525: (1) To pay for performance of abortions as a method of family planning or to motivate or coerce persons to practice abortions; (2) to pay for performance of involuntary sterilization as a method of family planning, or to coerce or provide financial incentive to any person to undergo sterilization; (3) to pay for any biomedical research which relates, in whole or part, to methods or the performance of abortions or involuntary sterilization as a means of family planning; (4) to lobby for abortion?

4.

a. FAA Sec. 104(f); FY 1982 Appropriation Act Sec. 525:

(1) Yes
(2) Yes
(3) Yes
(4) Yes

b. FAA Sec. 620(g). To compensate owners for expropriated nationalized property?

b. FAA Sec. 620(g).

Yes

c. FAA Sec. 660. To provide training or advice or provide any financial support for police, prisons, or other law enforcement forces, except for narcotics programs?

c. FAA Sec. 660.

Yes

d. FAA Sec. 662. For CIA activities?

d. FAA Sec. 662.

Yes

e. FAA Sec. 636(i). For purchase, sale, long-term lease, exchange or guaranty of the sale of motor vehicles manufactured outside the U.S., unless a waiver is obtained?	e. FAA Sec. 636(i). All motor vehicles purchased will be of U.S. source and origin.
f. FY 1982 Appropriation Act. Sec. 503. To pay pensions, annuities, retirement pay, or adjusted service compensation for military personnel?	f. FY 1982 Appropriation Act. Sec. 503. Yes
g. FY 1982 Appropriation Act, Sec. 505. To pay U.N. assessments arrearage or dues?	g. FY 1982 Appropriation Act, Sec. 505. Yes
h. FY 1982 Appropriation Act, Sec. 506. To carry out provisions of FAA section 209(d) (Transfer of FAA funds to multilateral organizations for lending)?	h. FY 1982 Appropriation Act, Sec. 506. Yes
i. FY 1982 Appropriation Act, Sec. 510. To finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields?	i. FY 1982 Appropriation Act, Sec. 510. Yes
j. FY 1982 Appropriation Act, Sec. 511. Will assistance be provided for the purpose of aiding the efforts of the government of such country to repress the legitimate rights of the population of such country contrary to the Universal Declaration of Human Rights?	j. FY 1982 Appropriation Act, Sec. 511. No
k. FY 1982 Appropriation Act, Sec. 515. To be used for publicity or propaganda purposes within U.S. not authorized by Congress?	k. FY 1982 Appropriation Act, Sec. 515. Yes

VZCZCTGI
RR RUEIC
DE RUFHTG #9355/01 209 **
ZNR UUUUU ZZH
R 271532Z JUL 84
FM AMEMBASSY TEGUCIGALPA
TO SECSTATE WASHDC 4462
BT
UNCLAS

II.E PD 71 Waiver

TEGUCIGALPA 09355

CLASS: UNCLASSIFIED
CHRGE: AID 07/13/84
APPRV: MD:AJCAUTERUCCI
DRFTD: AG:FMANTEIGA:FMP
CLEAR: 1.AG:SWINGERT
2.PCR:EZALLMAN
3.PCR:MLIKAR
DISTR: AMB DCM AID

AIDAC

E.O. 12356: N/A
SUBJECT: PD 71 CITRUS WAIVER
REF: (A) CAUTERUCCI/MEIGHAN CONV-6/18, (B) STATE 198996
FOR: ROBERT MEIGHAN, GC/LAC

1. CITRUS HAS BEEN COMMERCIALLY GROWN IN HONDURAS SINCE THE EARLY 1940'S. BOTH THE U.S. BASED STANDARD FRUIT COMPANY AND THE HONDURAN AGRARIAN REFORM INSTITUTE EXPANDED CITRUS ACREAGE DURING THE 70'S.

2. THERE ARE DIFFERING ESTIMATES OF TOTAL CITRUS ACREAGE. MOST COMMONLY ACCEPTED FIGURES IN HECTARES ARE: ORANGE 4275; GRAPEFRUIT 1540; AND PERSIAN LIME 250. THESE FIGURES INCLUDE YOUNG PLANTINGS AND NON-PRODUCTIVE AREAS IN AGUAN VALLEY.

3. PRESENTLY, 13 PACKING FACILITIES EXPORT CITRUS TO EUROPE (GRAPEFRUIT AND ORANGES) AND TO THE U.S. (PERSIAN LIMES). IN 1983, ONLY 5 PERCENT (5,000 ST) OF TOTAL ORANGE PRODUCTION (96,375 ST) WAS EXPORTED TO EUROPE NONE TO THE U.S. GRAPEFRUIT EXPORTS (20,000 ST), ACCOUNT FOR 60 PERCENT OF THE 32270 ST PRODUCED (ONLY 830 STS DESTINED TO THE U.S. MARKET IN WINTER SEASON). FORTY (40) PERCENT (300 ST) OF THE LIME PRODUCTION (750 ST) IS EXPORTED TO THE U.S. DURING THE U.S. OFF-SEASON . MOST POPULAR BRANDS FROM HONDURAS ARE DOLE, MAYITA, MARY LOU BRAND, TORONJITA AGUAN AND TROPHY.

4. FRUIT, ESPECIALLY GRAPEFRUIT (RUBY RED, WHITES), IS AVAILABLE IN JULY WHEN OTHER PRODUCING COUNTRIES ARE NOT ABLE TO SHIP. BEST PERIOD RUNS FROM JULY 15 TO OCTOBER 15 WHEN LITTLE COMPETITION EXISTS FROM ISRAEL, BRAZIL, CUBA, AND SPAIN. LIMES AND GRAPEFRUITS ARE SHIPPED TO THE U.S. (WINTER MONTHS) WHEN THERE IS NO CONFLICT WITH AMERICAN PRODUCERS.

OFFICIAL FILE COPY

5. PROPOSED EXPORT DEVELOPMENT AND SERVICES (EDS) PROJECT PLANS TO SUPPORT THE REHABILITATION OF 1200 HAS. OF VALENCIA ORANGES OVER A FIVE-YEAR PERIOD. IMPROVED YIELDS WILL RAISE FROM A CURRENT 37.5 ST/HA TO 51 ST/HA., FOR A TOTAL VOLUME INCREASE OF 16,200 ST. APPROXIMATELY 35 PERCENT (21,420 ST) OF TOTAL PRODUCTION (61,200 ST) WILL BE SOLD IN DOMESTIC AND REGIONAL MARKETS. THIS EFFORT WOULD BE ASSISTED WITH

II E.2

RESEARCH INTO CITRUS PRODUCTION PROBLEMS UNDER THE PROPOSED RESEARCH FOUNDATION PROJECT.

6. THE BALANCE (39,780 ST) COULD EVENTUALLY BE EXPORTED AS FROZEN CONCENTRATE ORANGE JUICE (FCOJ) AT AN AVERAGE 60 DEGREES BRIX, WITH AN ORANGE/FCOJ CONVERSION RATIO OF 106 LBS/ST. AID SUPPORT MAY LEAD TO A POTENTIAL EVENTUAL FCOJ EXPORT OF 412 ST. (AS COMPARED TO BRAZIL'S FCOJ EXPORTS AVAILABILITY (83/84) OF 616,000 ST, AND EXPORTS TO THE U.S. IN FY 82 OF 1,170,487 MLT WITH A MARKET VALUE OF $ 245 MILLION.)

7. THE PROPOSED EDS AND RESEARCH FOUNDATION PROJECTS WILL SUPPORT INCREASES IN CITRUS YIELDS THROUGH RESEARCH, TECHNICAL AND MARKETING ASSISTANCE, AND TRAINING, AS WELL AS INSTITUTIONAL STRENGTHENING OF THE PRIVATE SECTOR ASSOCIATION OF CITRUS GROWERS. SOME FOREIGN EXCHANGE FINANCING OF IMPORTED INPUTS WILL ALSO BE MADE AVAILABLE THROUGH PROJECT RESOURCES AS WELL AS SUPPORT FOR THE ORGANIZATION OF SMALL AND MEDIUM SIZE FARMERS AROUND ONE, POTENTIALLY TWO, U.S. MULTINATIONALS. THIS APPROACH FOLLOWS GUIDANCE OFFERED BY AID'S ADMINISTRATOR IN REF: (B).

8. DUE TO RECENTLY ENACTED CBI LEGISLATION, STRONG U.S. INVESTOR INTEREST, REDUCTION OF U.S. PRODUCTION DUE TO 83/84 FREEZE, INCREASING PROBLEMS FACED BY BRAZIL (DISEASES SUCH AS TRISTEZA, LOW QUALITY, HIGH TRANSPORTAION COST, HIGH PH, NON-INDUSTRIAL ACREAGE AND ERRATIC PRODUCTION), AND AFTER CONSULTATION WITH AND STUDIES BY SEVERAL CITRUS EXPERTS, USAID/H STRONGLY BELIEVES THAT CITRUS PRODUCTION AND EXPORTS TO EUROPE AND THE U.S.-- ALBEIT LIMITED IN QUANTITIES AND VALUE RELATIVE TO U.S. AND WORLD MARKETS--OFFER A SIGNIFICANT EXPORT ALTERNATIVE TO HONDURAN PRODUCERS. WE ALSO BELIEVE THAT HONDURAN PRODUCTION WILL ONLY REPLACE BRAZILIAN IMPORTS RATHER THAN COMPETE DIRECTLY WITH U.S. PRODUCERS.

9. GIVEN THE ADMINISTRATION'S POLITICAL EMPHASIS ON CENTRAL AMERICA, AND BASED ON THE ABOVE TECHNICAL ARGUMENTS, USAID/H REQUESTS THAT AID/W APPROVE INCLUSION OF ACTIVITIES THROUGH WHICH ASSISTANCE WILL BE PROVIDED IN PRODUCTION, PROCESSING, AND MARKETING OF CITRUS FOR EXPORT BY BOTH THE EXPORT DEVELOPMENT

141

II E. 3

AND SERVICE (522-0207) AND RESEARCH FOUNDATION
(522-0249) PROJECTS.
NEGROPONTE
PT
#9355

NNNN

142

ANNEX III

TECHNICAL EXHIBITS

A. Technical Analysis for Research

A. RESEARCH METHODOLOGY

1. Identification of Research Problems

The selection of the commodities on which research is to be performed will be done by the Director General with the advice of the Board of Directors. For the non-traditional export crops, close cooperation will be maintained with the implementing agency of the AID Export Development and Services Project in making these determinations. It is expected that those groups submitting requests for research will have performed the required marketing studies and be able to prove the comparative advantage of investing research monies in a particular crop.

Once a crop has been chosen it will be subjected to further analysis in order to determine the specific problem(s) to be researched. To accomplish this task the Foundaton will contract the services of a top crop specialist for approximately one month. Such specialist would possess extensive experience with the crop in question and be familiar with research problems and efforts for that crop in a variety of countries. In the case of cacao, for example, the F.H.I.A. would seek someone of the calibre of the Director of the Cacao Research Institute in Brazil. Agricultural research centers and universities in the Free World will be the principal sources for recruiting this short-term assistance. The U.S. is expected to be a major source of this expertise. The close links envisioned between the Foundation and AID-S&T Office of Agriculture will facilitate the search for the best qualified candidate for the research needs analysis. S&T maintains a worldwide network that can quickly identify such persons.

In some instances, further problem definition might be required. In such cases the F.H.I.A. would contract an in-depth study group to further elaborate the research needs of a specific crop. The TA requirements would be for 2-3 people for a two-month period.

Following the analytical work described above, and based on their determination of the kind of research needed, the consultant(s) will estimate the numbers and types of personnel required, including a list of candidates for the senior scientist position(s).

2. Team Research

Research will be commodity-based and carried out by teams of scientists and technicians, the composition of which will be adopted to the needs identified during the problem analysis. All aspects of crop production will be considered including nutrition, weed control, disease and insect control, cultural practices and post-harvest problems.

The success of the team approach will depend in large part on the inputs of highly qualified senior research personnel who can provide the necessary leadership to the team. For this reason, F.H.I.A. will recruit world-wide for senior scientists and offer competitive salaries.

3. Basic and Adaptive Research

Research is seldom entirely basic or adaptive in nature. The Foundation will carry out both types of research depending on the research problems encountered. Adaptive research geared to quick results will be given priority.

Research, often, turns out to be neither clearly basic nor clearly adoptive and the Foundation will do a combination of the two, in varying degrees, based on the research problems identified during the initial analytical stage.

Activities more adaptive in nature would include: the determination of whether a new variety or cultural practice is suitable to local conditions; or the development of agricultural practices (such as weed control, disease and insect control, irrigation and fertilizer use) calculated to reduce crop loss and obtain optimum economic yields.

The solution of more complex problems will require more in-depth research. Studies of root development under certain types of culture or soil conditions, and other studies in plant physiology, are examples of more basic research to be undertaken by the Foundation.

4. On-Farm Testing

The work of the researcher is finished only when his product has been tested on farms, and is being used by farmers to increase economic production and productivity. There are innumerable techniques and combinations of trials which may be used to obtain desired results. Each research team will devise a system which fits their commodity and circumstances in order to reach their objectives. Through the assistance of the communications and outreach program information from farmers and cooperating extension agents will be recycled through the research program, and will be highly valuable in reorientation of research. (See technical analysis for dissemination).

5. Crop Monitoring

Once research results have been tested and accepted, the Foundation will change its research approach. It will be important to monitor the crop for additional problems, or the adaptation of new research information. However, the full research team may not be required, and some personnel can be assigned to new projects.

B. DESCRIPTION OF POTENTIAL RESEARCH TOPICS

The crops contemplated for inclusion in the research program of the Foundation fall into three groups: Non-traditional export crops, i.e. those which might be developed as a means of increasing the country's export earnings; the traditional export crops upon which the export earnings of the country customarily depend; and the basic food crops such as beans, corn, sorghum and cassava.

The purpose of this section is to provide a description of the type of research that could be undertaken on those crops that offer significant potential at this time -- and to provide a general picture of the type of effort that the research will require.

1. Non-Traditional Export Crops

Several crops are considered for possible development or expansion as a means of diversifying and increasing the agricultural exports of the country. Before a crop is admitted to the program, its potential markets must be carefully studied and its comparative competitive advantage against similar products from other countries must be determined.

a) Cacao (Theobroma cacao)

Cacao is traditionally thought of as being a crop ideally suited to the small and medium size farmer. Family labor can be used and a minimum of casual outside labor is required. Properly fermented and dried, the product is not subject to spoilage as is the case with fresh fruit. Cooperative arrangements for fermentation, drying and marketing are feasible and have the effect of easing the work load of the farmer as well as producing a more uniform and better quality product.

The spread of serious diseases however, has had the effect of dampening enthusiasm for cacao in some countries. Black Pod (Phytophthora Palmivora) is the universal cacao disease. It occurs in every country and varies in intensity in accordance with climatic conditions. Witches' Broom (Crinipellis Perniciosa), a very serious disease of which more than one race has appeared, has spread to all of the cacao-producing areas of South America except the state of Bahia, Brazil, and is to be found in several Caribbean Islands. As yet, it has not invaded Central America. Machete Disease (Ceratocystis Fimbriata) swept through all cacao producing areas during a period of several years until it had killed most of the susceptible plants and is now quiescent. Monilia Pod Rot (Monilia Roreri) has spread from South America to Central America and has recently appeared in Costa Rica. In Costa Rica, where losses to Black Pod have always been heavy, the advent of Monilia Pod Rot has proven disastrous.

Monilia Pod Rot is not now present in Honduras, and Black Pod is the principal disease with which the Honduran growers have to contend. It should be realized, however, that a project to develop a cacao-exporting industry cannot be successful in the presence of major disease control problems unless it is backed up by a complete and forward-looking research program and an effective extension operation.

The chemical control of these diseases is expensive. Hence, a cacao research program should be designed to achieve control at lowest cost and also, to obtain the highest possible yield. High yield must be obtained if spraying costs are to be tolerated. Other factors that may limit yield, such as nutrition, weed control and lack of water must not be allowed to intrude. Suggested research for the control of Black Pod which, at the same time, will pave the way for the control of Monilia Pod Rot follows:

(1) The correlation of meteorological data with disease incidence. Rainfall and temperature are critical.

(2) The study of the possibility of timing fungicidal applications in accordance with low temperature and duration of pod wetness. The timing of sprays in accordance with leaf wetness has been done for leaf diseases, measuring the duration of wetness of an artificial leaf with an electric circuit, and the same technique should apply to pod wetness. Thus it would be possible to develop a spray warning service based on pod wetness and temperature and economize on the total number of sprays applied. The equipment is simple and not expensive.

This procedure should work well for the control of Black Pod but the control of Monilia depends upon applications at the beginning of the rainy season and when the bulk of the pods are just forming or very young. Combined control should be possible.

(3) The Testing of new fungicides for the two diseases, including work on combination sprays.

(4) The testing of low gallonage spray equipment and application techniques.

Research should be conducted simultaneously on other aspects of cacao production with a view to the increase of yield, quality and efficiency. The following are some of the subjects which should be considered:

- The shade-fertilizer-yield complex
- Irrigation
- Weed control and the importance of a closed canopy over the plantation
- Undisturbed mulch on the plantation floor
- The improvement and simplification of fermentation and drying
- The acquisition of new genetic material, emphasizing disease tolerance
- Yield and quality
- Hand-pollination as a means of increasing yield and assisting in disease control

Contacts should be developed and maintained with countries where Monilia occurs and with countries having good research and extension programs in cacao.

The results of the program outlined above, properly imparted to the farmers, should result in increases in yield from the current 6-7 qq per hectare to 20-25 qq for established plantations more than 20 years old and more than 30 qq for new plantations planted to high-yielding hybrids. A listing of personnel and equipment needs, combined with coffee research is contained in section 2.b of this annex.

b) Macadamia Nut (*Macadamia integrifolia*, *M. tetraphylla*)

The two species used commercially for the production of Macadamia nuts have minor differences in leaf color, form, and shape of the nuts; *M. tetraphylla* has nuts more or less eliptical or fusiform in shape and *M. integrifolia* has nuts which are almost round.

Macadamia plants are propagated by grafting and there is great variability among seedlings. The commercial varieties have been selected for their yield, quality, vigor and other traits, and the variability of the seedling population lends itself to further selection.

The Macadamia requires a well-drained soil since wet areas appear to favor the development of Anthracnose on the leaves and nuts. Some varieties are resistant to Anthracnose. The planting distance used in Hawaii (35 feet between trees) seems excessive, but does offer scope for interplanting with row crops. The Macadamia is subject to wind damage and should be planted with windbreaks.

Suggested lines of research:

(1) Determination of the optimum planting density and distribution.
(2) Determination of the fertilizer requirements of Macadamia.
(3) Examination of the possibilities of intercropping and multiple cropping with Macadamia.
(4) Survey of the diseases and pests occurring on Macadamia.

This project may be combined with that of Pejibaye.

c. Pejibaye Palm (Bactris Gasipaes)

The fruit of the Pejibaye has been described as the most balanced of all tropical fruits, containing carbohydrates, oil, protein, minerals and vitamins. It is an important item in the diet of the people of some Latin American countries. The possibility exists, also, for the export of the canned fruit and this has been done to a limited extent in Costa Rica. As human food, the fruit is usually boiled in salt water, possibly with salt pork. The flavor and texture resemble chestnut, and the fruits make a very satisfactory substitute for chestnuts for stuffing poultry.

The fruit presents interesting possibilities for commercial development. Selections exist which offer good possibilities for development as human food and livestock feed and as sources of oil, and the possibilities are just beginning to be explored. The wood of the trunk has a beautiful grain and texture and has specialty uses in furniture manufacture. Smooth trunked (Spineless) selections exist. Mature trees yield in the vicinity of 35 tons of fresh fruit per hectare. Pejibaye grows in seasonally flooded soils and soils with poor drainage. This also makes it an attractive crop for otherwise marginal lands which occur with frequency in the northern lowlands of Honduras and which presently have little or no agricultural value.

Another product of the Pejibaye is Palmito, or heart-of-palm. By planting suckers of the palm closely spaced in rows like a field crop, a continuous harvest of suckers about 10 feet high for heart-of-palm may be maintained. A thriving business in heart-of-palm has been established in Costa Rica where the material is being canned for export. The yield per hectare is reported at about four tons.

Research on Pejibaye is being done at CATIE. A cooperative research-development project involving the Ministry of Agriculture, the University of Costa Rica and the Atlantic Coast Banana Growers Association is headed by Dr. Jorge Mora Urpi, Dean of the Faculty of Sciences and Letters of the University. Dr. Mora is a geneticist and has collected Pejibaye throughout Central America and northern South America, including the Amazon Basin. He should be contacted as a source of material and information for a Honduran Pejibaye Project.

The following are suggested lines of research:

(1) Determination of the optimum planting systems for Pejibaye as heart-of-palm and for fruit under Honduran conditons.

(2) Determination of fertilizer requirement for heart-of-palm and for Pejibaye fruit production.

(3) Establishment of a Pejibaye germ plasm collection.

(4) Examination of the possibilities for exploitation of Pejibaye fruits of different oil, starch and other composition as human food and animal feed.

(5) Examination of the possibility for intercropping and multiple cropping with Pejibaye, with special emphasis on smooth trunked varieties as supports for Black Pepper.

(6) Survey of diseases and insect pests on Pejibaye.

The Foundation could establish a Pejibaye project for heart-of-palm very quickly at low cost by arranging to purchase suckers from Costa Rica. The establishment of a nursery and demonstration planting would take little time and FEPROEXAH could handle the recruitment of farmers interested in the venture. A thorough job of market exploration would have to be done and a pilot canning facility would be needed. (Household or kitchen type equipment would suffice.) A small but growing export operation could be in place within two years at little cost to the Foundation.

Simultaneously, Pejibaye seed could be planted to establish a variety collection and an experimental planting of palms to produce fruit and on which various of the research projects mentioned above could be mounted.

Personnel and Equipment needs for the Pejibaye and Macadamia Projects are outlined below.

Personnel

1 Associate Research Scientist (Horticulture) Team Leader
1 Assistant Research Scientist (Agronomist/Soil Scientist)
2 Research Associates (Horticulture)

3 Research Assistants (Horticulture)
1 Foreman
12 Laborers

Agricultural Equipment

1 Set of disc plows
1 Set of bedding discs
1 Small tractor
1 Cart
1 Vehicle 4 x 4, Jeep type
1 Motorbike
Miscellaneous small tools
Irrigation equipment

Chemicals

Fertilizer	1 ton, single plant nutrient sources for $N_1P_2O_5$ and K_2O.
Fungicides	10 Kg.
Insecticides	10 Kg.
Herbicides	25 Kg.

Plant Material

Plant material for an experimental, pilot plantation of Pejibaye for heart-of-palm can probably be obtained in the form of suckers from Costa Rica. Seed to establish trees for fruit production, including variety collection and research plots can be obtained from the same source in the form of seeds and suckers. Macadamia plant material may be obtained from the University of Hawaii. The Honduran Coffee Institute has already made this connection.

Land

15 Hectares on station
Additional land of cooperating farmers.

d. Citrus: Sweet Orange (C. sinensis), Grapefruit (C. paradisi), Lime (C. aurantifolia), Tangerine (C. reticulata)

About 5,000 Hectares of Citrus are now being grown in Honduras and there exists the potential for about 15-20,000 Hectares more. This consists mostly of sweet orange, grapefruit and limes, although there are some tangerines. Citrus growing seems, in general, to be in good shape. The Tristeza virus disease does not occur in Honduras. More than acceptable losses are being suffered, however, from Gummosis (Phytophthora citrophtora, Ph. parasitica). Much of this traces its origins back to poor grafting techniques and is aggravated by poor cultivation practices (hitting low grapt with farm implement) including grass/weed burning.

Gummosis is controlled by the use of the Sour Orange as a rootstock, since it is resistant to the disease. Since the fungus is still present in the field, however, and the material budded to the rootstock is still susceptible, the disease may appear above the graft union, especially on trees grafted low, unless care in taken to avoid the cultivation/weed control malpractices mentioned above. The field control of Gummosis becomes of primary importance, therefore, and constant vigilance and the diligent prosecution of control measures are required.

It is of primary importance that Tristeza be kept out and that only virus-free budwood and rootstocks be used for planting. This is a responsibility which should be assumed by experts at the Foundation to assure that disease---free rootstocks and budwood may be established in each Citrus-producing region.

Possible lines of service and research are:

(1) The indexing and testing of rootstocks and budwood.
(2) The establishment of a variety collection as a source of disease-free budwood and rootstocks for present and potential needs.
(3) The testing of fungicides and techniques for the field control of Gummosis.
(4) The survey and monitoring of the diseases of Citrus, and the study of control measures for any that appear threatening.
(5) The survey and monitoring of Citrus insect pests and the development of control measures with minimum spray applications.
(6) The study of fertilizer requirements and minor element problems as they relate to soil conditions.
(7) The development of efficient weed control methods; mechanical, chemical, use of legume cover crops, and combinations of these.

It is reasonable to expect that a substantial increase in yield should be expected as a result of the combined effects of a more effective control of Gummosis, improved weed control, and the solution of fertilizer and minor element problems.

Personnel and Equipment needs for citrus research are outlined below.

Personnel

1 Associate Research Scientist (Horticulture) Team Leader
1 Assistant Research Scientist (Pl. Pathology) (50%)
1 Associate Research Scientist (Agronomist/Soil Science)
2 Research Assistants (Horticulture Economic Entomology)
1 Budder (superior laborer)
6 Laborers

Equipment and Vehicles

2 knapsack sprayers, hand operated
1 pick up 4 x 4
1 motorbike
(Heavy duty spraying equipment, such as an air-blast sprayer, will be needed as the trees reach maturity, but will not be needed in the first couple of years).
miscellaneous hand tools
irrigation equipment (perforated hoze)

Chemicals

-Fertilizer, Individual plant nutrients NH_4NO_3, TSP, Muriate of Potash plus a source of Sulphur, Magnesium and Calcium	1 ton
-Minor elements, for spray application	10 Kg.
-Fungicides	10 Kg.
-Insecticides	10 Kg.
-Herbicides	25 Kg.

Plant Material

Plant material for the establishment of an experimental plantation and collection can probably be obtained within the country through FEPROEXAH at little or no cost. Varieties not occurring in Honduras and desirable for the variety collection, including rootstocks other than sour orange would be imported.

Land

20 Hectares
Additional on cooperating farms, several locations.

e. Spices

There are several spices which might be considered for development. These should be considered as export possibilities, and as desirable additional farm projects for the small and medium size farmer.

(1) Black Pepper (Piper nigrum)

Several plants are to be found in the area and are prospering. Black pepper is obtained by harvesting the whole dried fruit; white pepper is the seed from which the pulp has been removed.

Pepper is a climber which must be supported. Posts may be used and "living fence posts" are often used, usually fast growing legumes which can tolerate heavy pruning. The vines may also be grown on palms thus providing an extra crop and additional income to the farmer. The vines are propagated by cuttings.

Pepper requires a well-drained soil, and high water table situations should be avoided. The two principal problems: Pepper yellows caused by Radophilus similis and Foot Rot caused by Phytophthora palmivora, are worsened by wet soil conditions. Suggested research subjects are:

- Plant tissue culture techniques to rapidly multiply desirable, disease resistant/free planting materials
- Testing of fungicides for the control of Foot Rot.
- Testing of nematicides for the control of Pepper Yellows.
- Development of the technique of reproduction by single-node cuttings.
- The study of planting distances and intercropping. Testing of economic trees as supports i.e. palms, and the possibility of intercropping, producing two or more crops on the same land simultaneously.
- Fertilizer trials to improve and maintain yields.
- Effects of spacing and shade on yield, quality, eveness of ripening.
- Alternatives in harvesting.

(2) Nutmeg (Myristica fragrans)

The nutmeg tree is the source of two spices; nutmeg from the seed and mace from the fleshy aril which surrounds the seed. Jams and jellies may also be made from the fruit. The nutmeg requires a deep, well-drained soil, abundant, well distributed rainfall, 2,000-2,500 mm per year with only a very short dry season.

Nutmeg is typically planted from seedlings raised in shaded nurseries. Since the tree is dioecious, about 50% of the trees will be male. Ten percent male trees are retained in the plantation and the rest topworked. Male trees cannot be identified as such until flowering, although it is claimed that they can be detected in the nursery by slight differences in leaf shape.

Nutmeg does not seem to suffer from any very serious diseases or pests. Suggested research subjects are:

- Biological Nitrogen Fixation to supply Nitrogen to nutmeg while supplying a weed-repressing ground cover.
- Devise a method for the detection of male plants in the nursery.
- Improve the techniques for asexual reproduction of nutmeg.
- Develop improved methods for drying nutmeg and mace.
- Study the diseases and pests of nutmeg.
- Fertilizer trials based upon soil conditions and nutrient requirements to improve quality and maintain yield.
- Study of planting distance and intercropping.

(3) Pimento, Allspice (Pimenta dioica syn. P. officinalis)

The dried unripe fruits are the source of "allspice", said to combine the flavors of cinnamon, cloves and nutmeg. Also the source of Pimento berry oil used in Bay Rum and Pimento leaf oil, which is a source of eugenol and vanillin.

Pimento requires a deep, well-drained soil and does well on limestone soils which are common in northeastern Honduras. It is grown in areas with 40-100 inches of rainfall. Propagation is by seedlings and little improvement work has been done on the crop.

Pimento Leaf Rust (Puccinia psidii) occurs in Jamaica, attacking expanding foliage, inflorescences and young stems and may cause defoliation. The disease is favored by cold wet weather and is more prevalent at altitudes over 1000 ft. It would, therefore, probably not be a problem on the North Coast of Honduras. Suggested research subjects are:

- Selection of seedlings for improved yield
- The study of Pimento diseases and insect pests
- The study of planting distance and intercropping
- Fertilizer trials to improve and maintain yield
- The study of harvesting and drying techniques to maintain tree vigour and to enhance quality.

(4) Cardamom: (Elletaria cardamomum)

Cardamoms are adapted to altitudes between 600 and 1500 meters so that the immediate radius of activity of the Foundation would not be appropriate for this spice. It is mentioned, however, because it could provide a crop for the diversification of the coffee farmer in the mountains particularly in wetter areas and where good shade is available. Its environmental needs are much the same as those of ginger, to which it is related.

Cardamom may be marketed either as whole pods or decorticated seed. Harvest proceeds throughout the year. Reproduction like that for ginger, is by rhizome cuttings and, should Cardamom Mosaic be present, care must be exercised to avoid the spread of that disease through the rhizomes. Sources of certified clean planting material would have to established. Another disease, Stump Rot, caused by Pythium sp., causes the breaking of shoots. This disease is favored by poor soil fertility and can be controlled by good management.

Suggested areas of research are:

- Plant tisse culture techniques to obtain disease-free planting material and to quickly multiply the desirable cultivars.
- Techniques to obtain the best runoff control and soil retentio, since this crop will be grown on hillsides.
- Establishment of disease-free sources of planting material with emphasis on mosaic.

-Study of the fertility requirements of Cardamom and the site specificity of need, or lack
Therefore, of shade over the planting.
-monitoring of diseases and pests occurring on the crop.

The spices are not thought of as possibilities for large-scale development but, rather, as crops which might offer an interesting possibility to the farmer to diversify his operation. They offer interesting possibilities for intercropping and multiple use of the land. Nutmeg and Allspice for example, might be valuable additions to a small-scale livestock operation in combination with improved pasture management practices. Intercroping cardamom could become quite valuable for the struggling coffee farmer in the mountains. The existing growers organizations could handle marketing of these crops, although the Foundation would have to do the initial market exploration before these crops were definitively established.

It would be necessary to establish plantings of the spices at the Foundation or other appropriate location from which planting material could be obtained and upon which appropriate observations could be maintained and necessary research carried out. This would be a relatively low cost operation.

Personnel

1 Associate Research Scientist (Horticulture) Team Leader
1 Assistant Research Scientist (Plant Ptahology) (50%)
1 Associate Research Scientist (Agronomy/Soil Science) (50%)
3 Research Assistants (Horticulture/Econ. Entomology, Plant Pathology)
1 Budder - grafter
6 Laborers

Equipment and vehicles

1 Motorized knapsack mistblower
2 Knapsack sprayers, hand operated
1 vehicle, 4 x 4, Jeep type
1 motorbike
Miscellaneous hand tools
irrigation equipment

Chemicals

Fertilizer, individual plant nutrients and minor element sources	1000 lbs.
Fungicides 10 Kg.	
Insecticides	10 Kg.
Nematicides	10 Kg.
Herbicides 25 Kg.	

Plant Material

It may be possible to obtain some plant material of the spices from the Lancetilla valley. Other quantities can be imported.

Land

20 Hectares.

f. Vegetables

Melons are being produced for export in Choluteca, as are cucumbers in Comayagua. A packing plant for the export of onions is planned for the Zamorano area. Small exploratory shipments of Snow Peas have been made to Miami from the mountains near Tegucigalpa. Twenty-seven different vegetable crops were tested in La Lima in 1976-77 and post-harvest and food technology studies were made on some of these.

The growing of vegetables for local markets in Honduras is beset with problems having to do with transportation, marketing, and middlemen. An assured outlet for produce to a cannery or packing plant would be a welcome alternative to the present marketing system for many farmers. Most temperature zone fruits and vegetables can be grown in Siguatepeque, La Esperanza, Zamorano and Comayagua.

Obviously, most of the activity of the vegetables research people would be carried on at a distance from the Foundation, and would involve working on the land of cooperating farmers and farmers cooperatives and associations in such places as Siguatepeque, La Esperanza, Zamorano and Comayagua.

Very heavy emphasis would have to be placed on post-harvest handling, transport and marketing. Such a diverse collection of potential crops will have the usual research needs. Suggested lines of research follow:

- Control of post-harvest food losses
- Market exploration
- Post-harvest processing and shipment
- Fertilizer and minor element problems
- Disease and insect control
- Weed control
- Irrigation
- Indigenious production of quality seed.

Personnel and supply needs for research on vegetables are:

Personnel

1 Associate Research Scientist (Horticulture) Team Leader
1 Assistant Research Scientist (Horticulture)
1 Associate Research Scientist (Plant Pathology 50%)
1 Assistant Research Scientist (Econ. Entomology 50%)

1 Associate Research Scientist (Agronomy/Soil Science)
1 Research Associate (Horticulture)
1 Research Assistant (Pl. Pathology)
1 Research Assistant (Econ. Entomology)
6 Laborers

Agric. Equipment & Vehicles

2 Knapsack sprayers, hand operated
1 small backpack motorized high pressure sprayer
1 vehicle, 4 x 4, Jeep type
1 motorbike
miscellaneous hand tools
irrigation equipment

Chemicals

Fertilizer,	1 Ton. individual plant nutrients (see above)
Fungicides 25 Kg.	
Insecticides	10 Kg.
Herbicides 25 Kg.	

Land

10 Hectares
Additional land on cooperating farms in diverse parts of the country. Much of the work of this project will be done away from the station.

g. Ornamentals (Foliage Plants)

Five or six ventures in the exportation of ornamental plants have been made in Honduras and most have not fared well. Various explanations have been given for this including poor market research, bad management of the farm and poor quality of the product.

It is evident, however, that the production of foliage plants for export can be a good business if care is exercised to avoid the various pitfalls mentioned above. The operation must be managed with great care, with extreme measures being taken to assure a high quality product.

The farm visited at La Masica has 40 acres in production with the possibility of expansion to 100. In addition, there are 10 acres in San Pedro and, also, 30 at Lake Yojoa which operate in conjunction with 40 acres owned by small farmers being organized into a cooperative. Present production is 420,000 plants per month which is expected to expand to 600,000 per month next year. Approximately 50 species or varieties in 12 genera are being produced, mostly as cuttings, with export to Holland, Denmark, Belgium, Germany, Spain, Venezuela and Canada and to Florida, Mississippi, Pennsylvania, Texas and California in the United States.

Possible lines of investigation are:

- -Survey and monitoring of diseases and pests
- -The testing of fungicides in combinations, protectant and systemic, to find new, non-phytotoxic combinations.
- -The testing of phytohormones for rooting cuttings.
- -Exploration of new markets.
- -Plant tissue culture techniques to maintain uniformity in superior materials.

The foliage plants are not a high priority item for the Foundation. Since, however, the Foundation will be testing fungicides and insecticides in connection with other projects, information on new materials could certainly be made available, as could also new information on phytohormones. The Foundation could probably also assist in market exploration. The ornamental plant growers seem to have their problems well in hand and do not need much help.

2. Traditional Export Crops

a. Banana and Plantain

Bananas and plantain represent a major food complex and are extremely important to the diets of people in the tropical and developing world. In addition, bananas represent a major cash crop for world sales. Plantains are becoming a major cash crop as advanced packing and shipping methods are made available. Frozen containers and plastic bags make it possible to move these products which were heretofore consumed only in tropical areas where they are grown.

The United Brands Company decided to eliminate its banana and plantain breeding and improvement program and withdrew funds from it as of January 1, 1984. Many advances have been made by this program and the invaluable collection is being maintained temporarily by funds supplied by FAO. A decision concerning the future of the improvement program, including the collection, should be made in the immediate future.

Other improvement programs exist in Jamaica and Brazil and perhaps several commercial companies have programs in other areas. However, considering the advanced stage of the United Brands program, it seems worthwhile to make every effort to continue the progress and make the results available to all who are interested. It would seem that all countries producing bananas and plantains, the Union of Banana Exporting Countries (UPEB); the recently formed network supported by the International Development Research Center (IDRC) of Canada; and, the Food and Agriculture Organization (FAO) of the United Nations should be interested in continuing support of the banana improvement program.

Apparently, the commercial companies will continue their immediate production research to remain competitive in the market place, but it seems extremely short-sighted not to also continue the vital improvement program even though it is long range in nature. A paradox exists. On the one hand, banana and plantain are major food crops for millions of people, and on the other hand bananas and plantains are rapidly becoming major commercial crops being sold worldwide.

Plantains and bananas are important carbohydrate food crops in many tropical countries. Current world proudction is estimated at over 62 million tons of which about 19 million tons are grown in Africa, with Uganda, Nigeria, Rwanda, and Zaire the largest producers. Sixteen million tons are grown in Asia, with India, the Philippines, Thailand, Sri Lanka and Indonesia predominating. Sixteen million tons come from South America with Brazil by far the largest producer in the world, followed by Ecuador and Colombia, and 9 million tons from Central America and the Caribbean where Mexico and Honduras are the biggest producers. Since the world export trade in bananas is only about 7 million tons, it is clear that the crop is far more important globally as food for local consumption than it is as an export commodity.

Currently, about half of the bananas consumed are eaten raw and ripe and the remainder are eaten as a cooked vegetable. In some African countries bananas are a staple in the diet, average daily consumption may exceed 0.5Kg. with daily intakes providing between 300 and 600 calories. Some African rural communities obtain around half of their total calorie intake from bananas. At the global level plantains are the thirteenth most important crop in calorie terms and fifteenth in terms of protein. A recent TAC paper (Pineiro 1984) notes that they represent a major gap in the CGIAR coverage of food crops.

It is difficult to estimate the value of plantain and bananas, but if export prices are in any way indicative of the global situation, the total farm value for world production is in the order of US $10 billion per annum. The importance of plantain/banana in an individual economy is illustrated by the example of Colombia where the total farm gate value of the crop in 1983 exceeded that of rice and was equivalent to 50% of the value of coffee which is the mainstay of the Colombian economy.

Information on the costs of research on plantains and bananas is not readily available, but indications are that for research about US $6 million (or 0.06% of the value of the production) is spent.

At its zenith, United Brands was maintaining its program with $5,000,000 annually which supported 31 principal staff with laboratories, equipment and supplies. Substantial progress was made, but the long awaited breakthrough of new Black Sigatoka resistant commercial varieties of banana and plantain have not been forthcoming. This will probably take another 5 to 10 years. It must be understood that this is an enormously difficult task since Gros Michel, the previously used variety, produces only an average of 2 seeds per bunch and Cavendish and Gros Michel are triploids and like the mule are sterile. Therefore, the breeding program is slow, tedious, and extremely difficult, requiring special personnel who have patience and perseverance.

It is not sufficient, therefore, to continue the breeding and improvement program at maintenance levels. It is highly desirable to rebuild to a level approaching that once maintained by United Brands to increase the probability of success. This is an expensive and long term effort.

The Foundation should stand ready to participate in the banana and plantain improvement program when support is forthcoming from various outside sources. La Lima remains the locus of research excellence in plantain and banana breeding, and the germplasm bank for world improvement will continue to function at a maintenance level until the larger issues surrounding long-term funding are resolved. Once funding is secured, the Foundation is in an excellent position to administer a full scale genetic and breeding research program.

The breeding will have two main objectives: to improve production for export and to breed bananas for local consumption. Certain clones may be highly acceptable as a local food and yet may not have all of the characteristics needed for acceptance in international markets. The breeding program should continue to utilize standard breeding techniques, but it should also consider some of the new and faster methods such as induced mutation or somatic hybridization. Since both Gros Michel and Cavendish were found in nature, presumably as mutations, these breedig methods seem to have relevance in the banana improvement program.

To implement such a program highly skilled personnel will be required, and perhaps collaboration with universities or other institutes doing this kind of work.

The following is a list of personnel that the banana improvement people proposed as necessary for an effective breeding and selection program:

2 Plant Breeders/Biotechnologists
- For Black Sigatoka
Crown rots, and molds

1 Soil Scientists/Agronomist

1 Pathologists for
Black Sigatoka,
Crown Rots and molds

1 Plant Explorer (50%) (Together with Soil Scientist and/or Plant breeder, will explore for resistant germplasm at Center of diversify for Bananas/Plantain (New Guinea, Solomous, Malasia, Indonesia)

It also would be desirable to hire a number of specialists to study uses of discard bananas for animal feed and green bananas for starch to replace cassava in glues. If the banana and plantain business is to remain competitive with other fruits it must economically utilize the discarded fruit

to avoid a total loss. Bananas are as good as corn for energy feed for swine, up to more than 50% of the diet if properly balanced with protein and minerals. The pigs will shuck the bananas almost like humans and eat the fruit. They will also eat some of the skins if they are hungry enough.

In view of new races of Panama disease presently in South Africa, Australia, Philippines and Southeast Asia, this improvement program is urgent and should be supported at an expanded rate. It is likely that the above will not be enough personnel to fully staff the banana improvement program but it should be enough to reidentify the major problems and make significant progress in resolving them.

The United Brands installation to be donated to the Foundation contains most of the equipment needed by the banana improvement program including laboratories for soils, entomology, pathology, nematology, breeding, tissue culture, etc. less certain equipment supposedly being retained by the company. Certain replacements will probably be necessary since a number of laboratories are relatively old and the equipment has seen considerable service.

Equipment and Transportation
- 10 4 x 4 pickups
- 4 motor bikes
- 1 spectro photometer
- 1 video equipment
- 1 camera equipment

$50,000 per year in supplies
- chemicals
- laboratory glassware
- microscope discs and slides
- tissue culture media
- reagents, dyes and agar
- apparatus for laboratories

b. Coffee (Coffea arabica)

Coffee is grown by an estimated 40-50,000 farmers, mostly relatively small growers, many with holdings of only 1.5-3 acres. Most of the coffee is found at altitudes of 3500-4000 feet. The Honduran Coffee Institute has developed an active program of research and extension with 4 or 5 small experiment stations. The growers are organized and these organizations are being utilized for the group spraying of coffee for the control of Leaf Rust, Hemileia vastatrix, and the Coffee Berry Borer, Stephanoderes coffeae. Varities resistant to Leaf Rust are being distributed. In order to pay for a disease and insect spray program, and still turn a profit, the yield of the plantation must be good - an estimated 30 qq per hectare.

Possible lines of research, which might assist the Honduran Coffee Institute in its efforts to help the coffee farmer, are:

1. The testing of fungicides for the control of Leaf Rust and insecticides for the control of the Berry Borer.

2. The testing of low volume spraying equipment (this may be combined with similar work on cacao).

3. The development of a spray warning system for Leaf Rust based on leaf wetness, as described earlier under cacao, as a means of increasing spray effectiveness and economizing on the total number of applications.

4. The shade-fertilizer-yield complex (a similar situation to that on cacao).

5. The evaluation of rust-resistant varieties.

6. The evaluation of possible crops for the diversification of the coffee farm. Cardamom is one possibility.

7. The monitoring of the diseases and insects which appear on the crop.

The Foundation staff would be operating at long range on coffee. Fungicide testing and trials of low-volume spraying would already be proceeding on cacao and this could be expanded to include coffee. Close cooperation would be necessary with the staff of the Honduran Coffee Institute in order for the Foundation to make a contribution. Meteorological instruments would have to be installed at several locations in the area, as would instruments to record leaf wetness, in order to develop a spray warning system.

This program could very well be combined with that of cacao, using the same personnel and supplies.

Personnel

1 Associate Research Scientist (Horticulture), Team Leader
1 Associate Research Scientist (Plant Pathology)
1 Assistant Research Scienties (Economic Entomology)
1 Research Associate (Agronomy and Soil Science)
1 Research Assistance (Plant Pathology)
1 Research Associate (Econ. Entomology)
6 Laborers

Equipment and vehicles

4 motorized knapsack misthlowers (2 cacao, 2 coffee)
2 knapsack sprayers, hand operated
1 pickup, 4x4

162

1 motorbike
7 recording hygrothermographs (4 cacao, 3 coffee)
7 max-min thermometers
7 recording rain gauges
7 leaf witness recorders
Miscellaneous hand tools
Irrigation equipment (perforated hose)

Chemicals

Fertilizer	- 1 ton Individual Nutrients plus Boron, you do not need complete fertilizer in most places in Honduras.
Fungicides	50 kg
Insecticides	20 kg
Herbicides	50 kg

Land

10 hectares on station
Additonal on cooperators farms, several locations on coast for cacao and in the mountains for coffee.

3. Basic Food Crops

The well-being of Honduras depends in great part upon its ability to be completely self-sufficient in the Basic Food Crops. The Ministry of Natural Resources (MNR) has primary responsibility for research and improvement on these crops. However, because of internal financial and administrative difficulties the MNR has not been able to mount a successful long-term improvement program. The MNR, therefore, has requested the Foundation to collaborate in a basic food crops improvement program, utilizing the Foundation's stability and flexibility to help advance production research on these vital food crops.

An essential factor in building a successful research program in basic grains is to take every advantage of research being done by others. The International Agricultural Research Centers (IARC'S) and regional groups are concentrating on improvement of the basic food crops and much of this research information can be used directly by Honduras. Varieties and cultural practices resulting from other research may not be useable directly, but may require only a small amount of adaptive research to render the materials commercially acceptable. For example, CICA 8, a rice variety produced at CIAT is presently producing highly acceptable yields in the San Pedro Sula Valley, and the quality of grain is excellent and well accepted in the marketplace. In addition, CIAT has available lines of field beans, (*Phaseolus vulgaris*), which are highly resistant to the major virus and blight diseases, but they do not have the exact size, shape and color desired by consumers in Honduras. It is likely that a minimum of adaptive research would produce varieties highly acceptable to local consumers in a short time.

Germplasm of crops such as corn, sorghum, cassava, tropical forages and rice are readily available from the International Centers and would be highly valuable to Honduras if arrangements are made for ongoing collaborative programs with the Centers. The Centers are willing to collaborate because their mandate is not accomplished until their research results are being utilized by the research institutions of participating developing countries. As an example, the full value of the CIAT research programs costing more than $25 million annually could be available to Honduras for an estaimated cost of $600,000 per year. However, in order to be feasible, a flexible, simple mechanism is needed for this exchange . The Foundation can furnish that mechanism for the MNR through its special position, and the Centers can move personnel in and out of the country, import equipment and supplies, and export and import seed through the system established with the Foundation.

a. Beans

The International Center for Tropical Agriculture (CIAT) has senior scientists working on bean improvement along with a full team of research associates, research assistants, laboratory technicians and others. CIAT has its main breeding station at Palmira, Colombia and auxiliary stations are located in several areas representing various climates and soil types. In addition, CIAT has established a bean network in other countries and presently maintains research workers in a number of countries in Latin America and Africa. CIAT's bean research program includes collections, breeding and physiology, entomology, pathology, soil fertility, agronomy, irrigation and drainage, economics, nutritional quality and consumer characteristics, marketing, storage and other items such as a computerized system of literature collection. In addition, CIAT maintains contact with all others who are known to be working and publishing on the subject of bean research.

Honduras can profit from the CIAT bean research program by following up on preliminary arrangements between the Ministry of Natural Resources and CIAT. An initial request was made in early 1984 by MNR, and CIAT is willing to collaborate with Honduras on rice, beans, cassava and tropical forages and legumes.

Effective collaboration can be affected by establishing a CIAT regional outreach program in Honduras. This should consist initially of a principal CIAT staff member stationed at the Foundation to work on each basic food commodity undertaken for improvement. As the program progressed CIAT could move other personnel in and out of the Foundation, as required. It is understood that financing for this program must be provided since CIAT does not have funds for this purpose.

Research should be conducted simultaneously on a number of aspects of bean production. The following are some of the subjects which might be considered:

- Disease resistant types acceptable in Honduran markets (size, color, shape, etc.
- Virus resistance
- Insect resistance
- Cooking quality
- Root rot resistance
- Yield and effective symbiosis of Nitrogen-fixing Rhizobia with Phaseolus hosts
- Effective interaction with other yield-affecting micro-organisms such as mycoshizzia
- Other factors determined by the detailed survey

Personnel requirements for bean research would be:

1 Principal Staff (deputed from CIAT)
3 Research Associates (1 each for El Zamorano, Comayagua and S.P.S.)
10 laborers divided between stations
1 secretary and office help
Other part-time help at outlying stations for office and field work.

Note: In view of the collaborative nature of this program, the MNR may be willing to augment this minimum staff with additional scientists.

b. Corn

A similar agreement between the Foundation, CIMMYT and MNR could establish a collaborative program in corn which would be long-range, stable, and effective.

Corn should be bred for three major environments in Honduras, since corn grown as sea level will usually not make seed at the higher elevations. One of these, the lowland tropics can be located at Foundation headquarters. The second should be located at medium elevations, possibly on land at the Panamerican Agricultural School at Zamorano; and the third at high elevations, possibly at La Esperanza.

Varieties of Tuxpeno type maiz brought here from Mexico many years ago are presently being grown in the Sula Valley. Other materials recently produced by CIMMYT would be of much greater value to Honduras, particularly the flint type, opaque 2, high lysine (high quality protein types) presently available. Pigs fed high quality protein weigh approximately 50 kilos 6 months after weaning, whereas litter mates fed common corn and all the necessary minerals and vitamins will not grow and often die after about 120 days. One could extrapolate these results to children in Honduras who eat high levels of corn in their diet without access to legumes. The high quality protein corn in the human diet could make real differences in their health and well-being where beans are in short supply.

One Principal Staff member fully associated with and completely knowledgeable of the CIMMYT corn program could help Honduras benefit from the full range of world-wide corn improvement. This scientist could call upon additional help from CIMMYT staff if disease, insect, or other major problems are encountered and not easily resolved. This person also could provide on-the-job training to Honduran research associates.

A world-wide collection of corn is available, and improved populations adapted to Honduran conditions are ready for testing and utilization in breeding and selection programs here. Expert help is available from CIAT for seed production and other technical needs can be supplied from CIMMYT.

Research should be conducted simultaneously on a number of aspects of corn production. The following are some of the subjects which may be considered:

-- Yield and quality of grain
-- Insect and disease resistance
-- Adaptability
-- Plant type, height and ear height
-- Standability (resistance to lodging)
-- Husk cover against molds, insect and bird damage
-- Earliness vs. yield and quality
-- Agronomic practices, dates of planting and fertilizer regimes
-- Others as determined by market factors and the principal scientists.
-- Farming systems suitable for different major corn-producing areas.
-- Biotechnology research for Nitrogen fixation and resistance to salinity, aluminum toxicity and heat (in collaboration with S&T/Agr sponsored projects in these areas)

The program outlined above should result in substantial increases in production. Efforts on breeding should occur simultaneously with studies of the problem of excess production and of storage. A 10% increase in yield can lower local prices to the extent that small farmers may be driven out of commercial production (see social analysis).

Personnel and equipment needs for corn research are:

Personnel

-1 Principal Staff (deputed from CIMMYT)
-3 Research associates (1 each for S.P.S., El Zamorano, and La Esperanza)
-10 laborers divided between stations
-1 secretary and office help
Other part-time help at outlying stations for office and field work.

Equipment and vehicles

1 4x4 pickup
3 motor bikes
1 moisture testing machine
1 small calculator
6 60 h.p. tractor and equipment disk plow, black blade, lister blade, harrow (access to this equipment at other stations)

Supplies

500,000 glassine bags for pollinations (annually)
500,000 brown paper water proof bags for pollination
(per year supplies)

Note: The MNR is expected to post additional staff to this program in view of its importance to the country.

c. Rice

Honduras has a comparative advantage in rice production. It can be self-sufficient and have excess for export provided international markets are favorable. Prices of rice in Honduras are excessively high and more efficient production and reduction of costs can cause prices to be lowered, furnishing many dietary benefits to urban and rural consumers.

CIAT varieties in seed production, in lots of 25 hectares or more, are producing more than 6 tons per hectare (approx. 100 bushels per acre) near the airport at San Pedro Sula. Breeding materials available at CIAT for further selection in Honduras may produce even higher yields under good agronomic conditions with sufficient inputs and water control. Because of blast and hoja blanca (white leaf virus disease) an active and effective research program should be mounted. The Foundation can be helpful, as in corn, to assure progress and effective relationships and coordination between the MNR and the Centers.

The program for rice might consist of:

- Blast resistance
- Hoja blanca (white leaf virus disease) and other virus complexes using monoclorol antibody techniques to identify viral agents responsible in order to study effective control measures.
- Quality
- Yield factors
- Leaf Hopper, plant hopper viral disease vectors and other insects such as stem borers

Personnel and equipment requirements for rice research would include:

Personnel

-1 Principal Staff
-2 Research Associates - one should be soil scientist/agronomist
-5 Laborers
-1 Secretary part time plus other logistic help

Equipment and Vehicles

1 4 x 4 pickup
1 motor bike
1 access to 60 h.p. tractor with rice tires, disk plow, rototiller, back blade, modified harrow
1 small rice seed drier
1-2 Butler bins for rice seed storage
1 moisture meter
1 scale

5,000 burlap bags, tags and miscellaneous supplies

Note: Seed production is now underway with the assistance of a Nationalist Chinese Technical Mission. This work should be coordinated with overall efforts for improvement. The MNR will wish to supply additional personnel and support for the rice program.

d. Sorghum

Sorghum will, according to preliminary reports, do well in the San Pedro Valley in the dry season utilizing residual moisture. Sorghum is a better crop than corn under extreme conditions of too much or too little moisture. Moreover, sorghum has the ability to stop growth under drought conditions and begin again when rains come, whereas corn will not recover from extreme drought conditions. In addition, sorghum has approximately 95% the nutritional value of corn; some high protein, high lysine types greatly surpass the value of common corn.

ICRISAT, located at Hyderabad in South India, has large numbers of principal scientists working on Sorghum, and materials developed there in climates and latitudes similar to Honduras should be of real value in the dry regions of Honduras.

This sorghum program should be conducted in full collaboration between MNR, ICRISAT and the CRSP project presently operating in Honduras. Since sorghum will probably become more important in the future, every effort should be made to take advantage of world-wide research on the crop. The same Foundation mechanisms would be utilized as those on rice and corn.

Personnel

1 Principal Scientist
2 Research associates - at least one should be an agronomist/soil scientist knowledgeable in farming system research
10 Laborers
1 Secretary part time plus other logistic help

Equipment and Vehicles

1 4 x 4 pickup
2 motor bikes
1 access to 60 h.p. tractor and equipment including back blade, plow, harrow and rototiller
1 moisture meter
1 scale

5,000 burlap bags, tags and miscellaneous supplies

The improvement program should be fully coordinated with the CRSP and ICRISAT. The program may consist of research on:

- high quality protein grain for human consumption
- yield and other agronomic factors limiting production
- insect and bird resistance
- farming systems research for areas having sorghum production potential in Honduras (collaborative with S&T/AGR - sponsored projects in this area).
- biotechnology research in tissue culture for salt, drought and heat tolerance (collaborative with S&T/AGR - sponsored projects in this area).

This program initially would be conducted in full collaboration with the MNR at La Lima and Choluteca where the CRSP project collaborates with the Ministry of Natural Resources. Judgments should be made on the need to begin this program immediately in view of other efforts under way in Honduras. If the sorghum program cannot be launched due to scarcity of funds, it could be managed in collaboration with the corn program.

e. Cassava

Cassava has been almost entirely overlooked by research programs around the world. This is mostly because Cassava grows between the tropics of Cancer and Capricorn in developing countries, and few developed countries have taken enough interest in it to invest in research on this important food crop.

The production and value of Cassava in the Honduran diet has been grossly underestimated. Full advantage should be taken of the research now in progress at CIAT and IICA. Greatly increased yields and quality of cultivars developed at the International Centers makes cassava production much more attractive for small producers as well as for large commercial growers.

Cassava starch is a valuable product for export where it can be produced economically. Chips are valuable for animal feed. Thailand and Brazil are shipping hundreds of tons to Europe as dairy cattle energy feed. Cassava can be used in cattle feed up to 65% of the ration as a substitute for corn or other energy. It can be made into silage for storage and used as dry small chips for poultry feeding.

The research program might consist of the following:

- High yielding, high quality types for human consumption and high starch content for commercial use.
- Disease free clones for planting stocks.
- Propagation systems for disease free stocks
- Testing for quality, yield and markets
- Biotechnology - tissue culture techniques for producing disease-free planting materials.

Personnel

1 Principal Scientist
2 Research Assistant - one should be an agronomist/soil scientist with experience in farming system research.
1 Part time secretary
10 Laborers

Equipment and Supplies

1 4 x 4 vehicle
1 motor bike
1 scales
1 screen house for propagation
1 extractor for roots
1 access to 60 h.p. tractor and equipment - plow, harrow, back blade, disk, etc.

Supplies

1 storage area for propagation materials
1 shredder for roots
1 small dryer for roots
10,000 plastic bags for storage of samples, etc.

Note: The MNR should be interested in assignment of personnel to this program.

f. Tropical Forages and Legumes

Aside from their value for livestock, forages and legumes are extremely valuable as cover crops in citrus, coffee, and other corps, particularly on hillside agriculture. This group of crops should be included from the

beginning of the Foundation collaborative program with the MNR, or as soon as it can be financed and initiated. A 15% increase in cattle weights and a 20% increase in fertility of cattle should easily be accomplished with better nutrition from improved leguminous forages and improved management. Materials now available from CIAT and other sources, properly managed in Honduras, could make a considerable contribution to the livestock industry in the country in addition to the value of these species for cover crops and soil erosion control on hillsides.

The research program should be probed in depth by a competent group of scientists. Certain program areas are obvious:

- -screening of species for grazing and fodder
- -screening of species and varieties for ground cover in citrus, coffee and other tree crops.
- -testing legumes resistant to grazing especially legumes in pasture mixtures.

Personnel

1	Principal Scientist (Range Manager/BNF)
3	Research Associates
1	Secretary
1	Office Assistant
10	Laborers

Equipment and Supplies

1	Tractor and roto speed
1	planting equipment including plow, harrow, back blade
1	seed harvester
1	seed cleaner
1	seed dryer
1	seed storage bin
1	seed processing lab.
1	seed storage lab.
10	kilometers wire for fencing
2000	posts (wire-reinforced concrete - support Honduran small-scale industry)
1	rotating fund for purchase and sale of animals

Note: In view of the overall importance of this program the MNR should be interested in assigning personnel to this program.

B. Technical Analysis for Dissemination Channels

Table of Contents

I. Current Status of Dissemination System

A. Ministry of Natural Resources (MNR)
1. National Extension Service
2. Communication and Public Relations Unit

B. Other public sector institutions

C. Private Sector
1. Agri-business enterprises
2. PVO's
3. Producer/processing/trade associations

D. La Lima facility

II. Detailed Description of Foundation's Communication and Outreach Program

A. Organizational strategy and structure

B. Foundation audiences
1. National and international agricultural research and education institutions
2. The Honduran National Extension Service and other agencies of the GOH
3. Producer, processing, trade, PVO and other private sector organizations
4. Foundation governing bodies, public officials, potential cooperators and supporters of the Foundation
5. Potential sources of research contracts, grants and endowments
6. Honduran farmers

C. The Communication and Development Division
1. Directorate functions

D. The Communication Unit
1. The Communication subsytem
2. Functions
3. Relation to MNR
4. Relation to private sector and others
5. Relation to proposed AID/S&T Agricultural Communications Project

Figures

1. Regional MNR Directorates

2. Organizational Structure of Communication and Development Division

3. Agricultural Communications Network

Technical Analysis for Dissemination Channels

This Analysis for Dissemination Channels is extracted from a more complete analysis entitled "Communications and Development Division of the Honduran Foundation for Agricultural Research" by Dr. Howard E. Ray. That report is available in the USAID/H Mission's Office of Food and Agricultural Development.

I. Current Status of Dissemination System

The potential for dissemination of agricultural information to Honduran farmers through existing institutions and organizations is high. Institutions such as the National Extension Service of the Ministry of Natural Resources (MNR), various other public sector agencies such as the agricultural credit bank (BANADESA) and the National Agrarian Institute (INA), private sector companies engaged in the distribution of agro-chemicals and purchasing and/or processing of the farmers' production, farmer and producer organizations, cooperatives, and private voluntary organizations (PVO's) all have personnel in the field through which information could be conveyed to farmers. At present, however, the effectiveness of this dissemination system is seriously constrained by:

- a lack of an available communication network that regularly feeds relevant agricultural information to all potential members of the dissemination system and farmers' reactions and experience back to those generating new or improved agricultural technology and practices;

- serious institutional constraints;

- a lack of adequate tested, improved and adapted agricultural technologies and practices suitable for different regions of the country, and

- limited access of many farmers to needed agro-support services, information about which should be an integral part of the information disseminated.

Nevertheless, the basic elements of an agricultural information dissemination system do currently exist. It is reasonable to expect that the system can become much more effective in disseminating the new or improved technology and practices generated by the Research Foundation to Honduran farmers and organizations that can benefit from same if the Foundation assumes an active role in the system. Brief summaries of the present status of the organizations which make-up the dissemination system are presented below.

A. Ministry of Natural Resources (MNR)

The National Extension Service and the Communications and Public Relations Unit have principal responsibility for information dissemination by the MNR.

Although national level administration, planning and direction are provided by directorates in the MNR Secretariat, program operations are largely decentralized. Seven regional MNR Directorates have been established (six in 1974, and one in 1977) as shown in Figure 1. Two additional regional directorates to be established in the near future will presumably complete at least nominal coverage of the country.

1. National Extension Service

Extension action programs are carried out through the regional directorates and local extension agencies (offices). In all, there are approximately 100 local extension agencies in the country manned by about 240 extension agents. As such, this national program is highly inadequate to provide effective extension service to all farmers and rural families of Honduras using as it does, only conventional extension methods. The problem is exacerbated by insufficient vehicles, inadequate operating funds and bureaucratic rigidities. Local extension staff are low-paid, and often not adequately trained. A senior MNR official summarized the present situation when he stated recently that Extension cannot become an effective instrument for technology transfer under present conditions--there are no long term career opportunities, staff turnover is excessive, and operations are mired down in bureaucracy.

The MNR is cognizant of the problems cited above and is actively seeking ways to increase the effectiveness of its information dissemination and related support to farmers. For example, the Minister of Natural Resources has requested that the USAID/H Mission conduct an in-depth analysis of the National Extension Service and make recommendations for improving the administrative/institutional/operational structure of the program to make it more effective and more responsive to Honduran needs, particularly given the expected increased demand for services resulting from the Foundation's research activities. The study had not been completed at the time of this writing, but it is anticipated that it will provide solid recommendations and will give impetuous to improving the extension program. Another major step has already been taken, that of upgrading the MNR's communication unit. That step was taken with the full support of the Minister, National Extension Director and other senior MNR officials.

2. Communications and Public Relalations Unit

An agricultural communication unit was established within the National Extension Service several years ago. Following the pattern of Extension, small communication units were established in each region in addition to the central unit in Tegucigalpa.

Figure I

Regional MNR Directorates

Region No.	Geographic Area	Headquarters	No. of Local Extension agencies
1	South	Choluteca	16
2	West Central	Comayagua	13
3	Northwest	San Pedro Sula	16
4	Atlantic Coast	La Ceiba	9
5	Northeast	Juticalpa	9
6	East Central	Danli	22
7	West	Santa Rosa de Copan	15

Sources: 1983 Annual Report, Secretariat of Natural Resources.

A major activity of the regional units has been production of weekly agricultural radio programs broadcast over local radio stations. Evidence to date indicates that such programs have had only limited impact, the reasons for which have now been identified through recently conducted evaluations. As a result of those evaluations, a new approach to agricultural radio programming has been developed, and is being followed in some regions this year. It is still too early to assess the results.

The communication unit was upgraded in late 1983, and now comes under the direct purview of the Minister. Its staff is being strenghtened through transfer of staff and equipment from other directorates.

The reorganization occurred too late in 1983 to permit identifiable allocation of resources in the 1984 national budget. Such allocations are expected, beginning with the 1985 budget year. In the interim, the central and regional communication units are attempting to function with minimal staff, little equipment, totally inadequate transport, and no formal operating budget; their impact to date has been small. Thus, the degree to which these units will be able to provide effective communication support to Extension and other dissemination organizations is still to be determined.

The communication unit, supported by the Minister and Extension, is prepared to introduce innovative approaches to the use of communication media, techniques and methodologies that have the potential for greatly incrasing the effectiveness of extension staff and programs. If sufficient resources can be made available by the GOH, the information dissemination capability of the MNR should improve significantly.

NOTE: For more complete information about the communication unit, refer to "Agricultural Communications in Honduras; Analysis and Recommendations" prepared by the Academy for Educational Development earlier this year. A copy is available in USAID/Honduras.

B. Other Public Sector Institutions

A number of other institutions in the public agricultural sector have programs that disseminate information to farmers as a part of their functions to provide various types of services. An illustrative list of such institutions includes:

BANADESA	(Banco Nacional de Desarrollo Agricola) (National Agricultural Development Bank)
IHMA	(Instituto Hondureno de Mercadeo Agricola) (Honduran Institute of Agricultural Marketing)
INA	(Instituto Nacional Agrário) (National Agrarian Institute)
IHCAFE	(Instituto Hondureno del Cafe) (Honduran Coffee Institute)
DIFOCOOP	(Direccion de Fomento Cooperativo) (Cooperative Development Directorate)

The high degree of interest expressed by representatives of such public sector entities during an agricultural communications seminar sponsored by USAID/H and MNR in Tegucigalpa in April 1983 indicates significant potential for incorporating them into the system for dissemination of information generated by the Foundation.

C. Private Sector

From the standpoint of information dissemination, the private sector is considered in two broad categories, agri-business enterprises and private voluntary organizations (PVO's).

1. Agri-business enterprises

Private companies in the agri-business sector have numerous intermediaries dealing directly with farmers. Collectively, such enterprises could provide an effective mecahnism for disseminating information generated by the Foundation. At present, however, there appears to be a reluctance on the part of Extension and Research to take advantage of this potential due to concern that the information may be distorted or that it has not been sufficiently tested to be of assured reliability.

2. Private Voluntary Organizations (PVO's)

The PVO's represent a potentially significant vehicle for dissemination of agricultural information to rural families. Most are active at the village level, so have extensive contact with small and medium farmers, and some maintain their own extension support services. Although not all of their programs are agricultural, those focused on the village and rural development provide ready conduits for the dissemination of agricultural information or collection of feedback concerning the needs, aspirations and reactions of small and medium farmers. The more than 30 PVO's with agricultural or agriculturally related projects in Honduras which have been identified are at present woefully underutilized by Honduran research and extension institutions as dissemination channels. Two PVO's are discussed briefly below to illustrate the potential value of this group to the information dissemination and feedback systems.

World Relief is concentrating on work with Indians in northeastern Honduras in an area approximately equal to that of El Salvador with a total population of about 40,000. They are presently in the stabilization stage during which they are concentrating on getting the people settled and improving the production of food crops. The area is difficult from an agricultural standpoint as the land is predominantly in swamp or jungle and the soils are highly acidic. There are no roads into the area and transportation withing the regions is largely by water. It has been found that bananas, plantain, yucca, and cacao do well, and water buffalos are being introduced for providing draft power, meat and milk. Two experimental farms have been established to learn what will work and what will not.

The Director stated that their project is well-funded but that they lack the technical expertise needed for agricultural development. There is one extension agent in the region, but World Relief has obtained virtually no technical assistance from him. The project presently has one expatriate and 10-15 national agronomists working in the region. All are presently engaged in the stabilization program, but emphasis will shift to the development phase as soon as possible.

The World Relief Director expressed eagerness to be included in the information dissemination and feedback system. He indicated that the point of contact, at least initially, should be their Tegucigalpa office, and that all incoming information would be sent to the region within a day of its receipt. The project plans to install a radio transmitter and will have the capacity to produce localized programs in the native language into which relevant information coming from the Foundation would be incorporated. They would also be prepared to collect and transmit feedback from the region to th Foundation, and would like to take advantage of the Foundation's analytical laboratory and testing services.

CARE has no work at present in food production, although there are plans to do so. It does have a number of peripheral activities, however, that are agriculturally oriented, such as their "food for work" program in Choluteca, and its water conservation program being introduced into 15 communities per year. Seven Peace Corps Volunteers are working in the latter. Fruit trees --mango, citrus, peach, apple-- are being planted under the water conservation project to protect the sources of water for village water systems being developed under another CARE project. Fruit processing will be added latter. All CARE projects have health implications.

The CARE Director expressed interest in the improvement of traditional agriculture, mentioning soybeans specifically. There have been several unsuccessful soybean projects in Honduras, but experience in Costa Rica would indicate that the crop holds promise, particularly for medium size farmers. CARE has its own small extension service, with two extensionists at present.

The interest of CARE in participating in the dissemination system was equally as enthusiastic as that of World Relief. The CARE Director was also interested in the synergistic effect that could be obtained through inserting brief agricultural messages in health or nutrition programs and vice versa.

3. Producer/Processing/Trade Associations

The information dissemination potential of such groups is presently being utilized to only a limited extent.

D. La Lima Facility

The current communication-related facilities at La Lima include a photographic laboratory, small video production unit, and library. Little utilization of these facilities is being made at present for dissemination of information to Honduran institutions and farmers. This situation will improve dramatically as the Communication unit becomes functional.

II. Description of Foundation's Communication and Development Program

An overview of the Foundation organizational strategy and structure as related to the Communication and Development Program is presented in this section followed by a discussion of the various Foundation audiences and program objectives related to each.

A. Organizational Strategy and Structure

The organizational strategy will be to group all research and analytical testing services into a Research Division and those functions which deal with the Foundation's various audiences wholly or in part into a Communication and Development Division. Administration, Finance and Management functions will be handled by a third division.

As indicated in Figure 2, the Communication and Development Division will be organized into four units corresponding to its major functions: communication, training, library and information services, and development and public relations. The annex relates only to the Communications Unit of the large Division.

The general responsibilities of the Communications Unit will include planning, scheduling and producing materials in appropriate media directed toward specific audiences (in collaboration with research staff and MNR Communication Unit); dissemination of materials produced; operational (formative) evaluation related to communication needs and outputs; coordination and management of the communication network and feedback systems as they related to the Foundation.

Three specific mechanisms will be utilized to provide guidance to and facilitate the work of the Communication and Development Division:

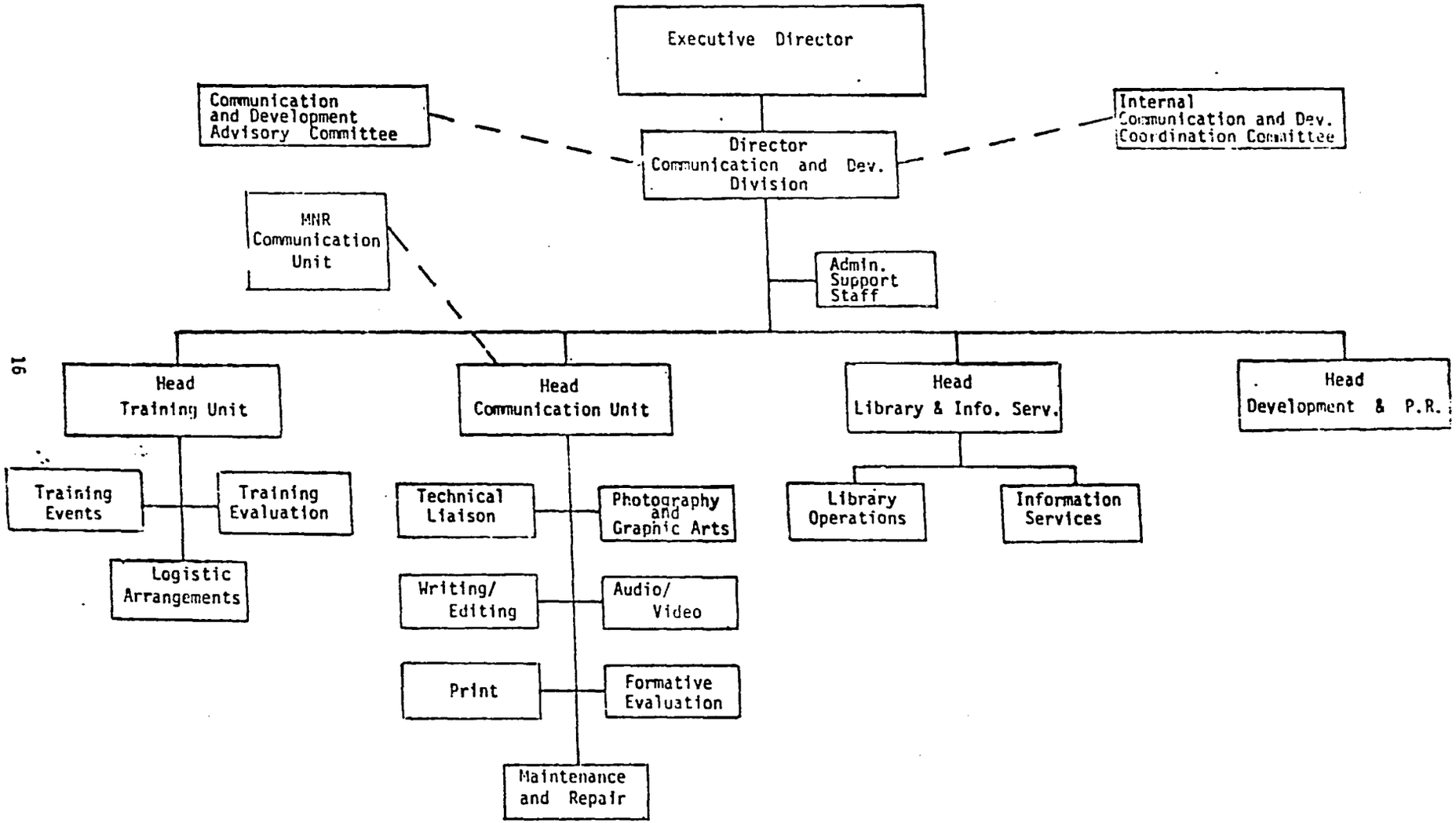
1) An External Communication and Development Advisory Committee, equivalent to the Technical Committees authorized in Article 27 of the Foundation Bylaws. Membership of the committee will include a representative from each of the categories of organizations identified in Figure 2.

2) An Internal Interdivisional Communication and Development Coordination Committee, comprised of one representative each from the Research and Administration divisions, the Executive Director's Office and the Multi-Disciplinary Research and Technical Analytical Services Department, and the Heads of the four Communication and Development Division units. The committee will be chaired by the Director of the Communication and Development Division.

3) A Memoradum of Understanding between the Foundation and MNR communication units, approved by the Foundation's Executive Director and the MNR Minister, which clearly delineates the functions and relationships between the two units.

Figure 2

Organizational structure of Communication and Development Division



B. Foundation Audiences

The Foundation, and hence the Communication and Development Division, will concentrate on reaching five distinct clients.

1. National and International Agricultural Research and Education Institutions. A client audience with which the Communicaton and Development Division will maintain contact and communication independent in large measure of the MNR. The program objectives related to Client No. 1 will include:

- develop continuing and effective interchange of research plans, progress and results, and other research information with institutions engaged in similar research and/or educational programs;

- facilitate the interchange of germplasm and other materials that will further the progress of research;

- develop staff exchange and training programs with international, regional and other national research institutions, and with appropriate universities.

2. The Honduran National Extension Service and Other Agencies of the GOH. A direct client for which the Communication Unit, working in close coordination and collaboration with the MNR Communication Unit, will have principal responsibility. The program objectives related to Client No. 2 will include:

- involve Extension with Foundation research staff in conducting on-farm trials to test new or improved technologies and practices under farmer conditions, and later conducting result and method demonstrations on those technologies that stand out in the field trials;

- to plan, organize and conduct training programs related to proven new technologies for extension workers;

- to effectively disseminate information through appropriate media to the ultimate users, and develop technical support to assist in identification and solution of problems encountered by the users;

- to disseminate information concerning agro-support requirements of new technologies to the public and private sector institutions who provide such support and to the GOH;

- to develop and operate an effective formative evaluation program to assure that information emanating from the Foundation is presented in forms that are understood and accepted by the users, and,

- to develop and operate feedback systems that provide the Foundation with up-to-the-minute information concerning the users' reaction to and experience with new technologies, and identify problems and potentials that merit priority research attention.

3. Producer, Processing, Trade, PVO, and Other Private Sector Organizations. A direct client, for which the Foundation Communication Unit in close collaboration with the MNR Communication Unit, will have principal responsibility. The program objectives related to Client No. 3 include:

- to increase the impact of Extension dissemination programs through using such additional channels to reinforce the Extension messages;

- to increase the coverage of potential ultimate users with information generated by the Foundation;

- to obtain guidance in developing the Communication and Development Division program;

- to inform about the analytical laboratory and testing and information exchange services avialable through the Foundation.

4. Foundation Governing Bodies, Public Officials, Potential Cooperators and Supporters of the Foundation. A direct client for which the Foundation Development and Public Relations office will have principal responsibility, with communication support from the Communication Unit. The program objectives related to Client No. 4 will include:

- to help establish the Foundation's roots in the local, national, regional and international communities;

- to ensure that the Foundation's long tern successes are carefully and consistently portrayed;

- to ensure that the Foundation's contributions to Honduran agriculture and the international research community are known and their value recognized.

5. Honduran Farmers. Principally an indirect audience reached through the communication network illustrated in Figure 2, although some direct contact will be achieved through on-farm-trials, field days, training courses, and other farmer-oriented events in which Foundation Staff are involved. The program objective related to this, the ultimate, audience will be:

- to achieve transfer to farmers of the technologies, practices and information developed by the Foundation that result in the successful and continuing use of same to increase their production and incomes.

C. The Communication and Development Division

As described earlier, the Communication and Development Division will be organized into four units which encompass the functions of the Foundation related to its external contacts and linkages. In broad overview, it will provide the vehicle for disseminating research information generated by the Foundation, gaining and maintaining a positive image of the Foundation, developing and facilitating the exchange of information and technical expertise with regional and international research and education institutions, and generating financial support for Foundation programs. Inclusion of communication, training, library and information support, and development and public relations into this Division will enable the Foundation to carry out these functions most effectively.

It is urgent that the Division be established and functioning as soon as possible, although its full development will require several years. As an example, four graphically crisp presentations of the Foundation are needed at the outset, one directed specifically to each of the following groups: 1) potential clients, 2) potential donors, 3) potential staff (as a recruitment tool), and 4) the general public.

The Disivion's four units are discussed in detail in the complete report mentioned earlier. Priority will be given to early establishment of the Division Directorate, the communication unit in its entirety, and maintenance of the existing library. Filling the positions of Head of Development and Public Relations and Head of Training will receive equally high priority. Other staff and facilities will be developed as time and resources permit.

The Communication and Development Division will have parity of status and priority for allocation of resources with the Research Division. Its Director will report directly to the Executive Director, and will be on a par with the Director of the Research Division in terms of qualifications, salary, perquisites and level of responsibility.

1. Directorate functions

The Director of the Communication and Development Division will have the following general and specific responsibilities:

a) provide leadership to the development and operation of the Division;

b) coordinate the activities and programs of the four Division Units;

c) prepare, in consultation with the Unit Heads, a long term strategy and plan for development of the Division, utilizing the counsel of the external advisory committee and the internal coordination committee;

d) prepare annual Division work plans and budget requirements for submission to the Executive Director;

e) represent the Division before the Executive Director, and, as requested by the Executive Director, the governing bodies of the Foundation;

f) serve as secretary to the external advisory committee;

g) serv as chairman of the internal coordination committee;

h) assure that program objectives related to all Foundation audiences are achieved and maintained; and,

i) serve as the interim Head of the Communication Unit during the first one to two years of operation.

D. The Communication Unit (F.C.U.)

The F.C.U. will be the largest unit in the Communication and Development Division due to the nature of its functions. The F.C.U. Head will report directly to the Division Director, and the Unit will provide communication support to the other units of the Division. Its major role, however, will be to work in close collaboration with the MNR extension service, Communications Unit, and the others in the dissemination system in developing and managing the communication network described below to disseminate information and receive feedback. Although modified somewhat in accordance with more recent investigations and discussions, it will be organized and function as described in the preliminary report, "Communication/Outreach Component of Proposed Agricultural Research Project, Honduras", available in USAID/H.

1. The Communication Subsystem

In the final analysis, the success of the Foundation in contributing to Honduras agricultural development through beneficial use by farmers, processors and exporters of technologies developed and tested by its research divisions will be dependent in large part upon a series of factors completely outside the purview of the Foundation. As stated in Article 3 of the Foundation Bylaws, its objective with respect to technical transfer per se extends only to maintaining communication services in support of agricultural extension and of the producer in general (Objective "d").

The effectiveness of Extension and other dissemination channels in reaching farmers with relevant information and convincing them to use it is a key factor in the technology transfer process. (The proposed AID/S&T agricultural communications project designed to establish links between the Foundation and MNR communication units and strengthen the capability of Extension to serve farmers is described later.) Beyond this, farmers need access to credit and inputs for production and to markets at which they can sell their excess production at a fair price. They also need access to technical backstopping for assistance in learning how to utilize a new technology and how to cope with emergency situations such as unanticipated insect or disease attacks.

Where processing and/or packaging may be involved, a similar series of needs must be met. In addition, production must be coordinated with processing and/or packaging requirements and operations. Finally, government policies (input/product price ratios, credit, import and export policies, etc.) must support and encourage the use of new or improved technologies by farmers and processors if they are to be adopted and sustained.

A viable communication network that ensures the rapid two-way flow of reliable and relevant information among all involved in the agricultural technology development and transfer process (including the farmers) is essential to achieve the needed coordination, provision of information and agro-support, and establishment of appropriate policies. The complex of institutions, channels and mechanisms utilized to develop, maintain and manage such a communication network is referred to as the communication subsystem.

The Foundation and MNR communications unit will be at the hub of the communication network, responsible for managing it and coordinating the flow of information in all directions. The concept of such a network and the interrelationships among its components with respect to information flow are illustrated in Figure 3.

In summary, the Communication Unit of the Communication and Development Division will form an integral part of a nationwide agricultural communication system whose major role is to develop, coordinate and manage a two-way communication network linking together all elements essential to the technology transfer process.

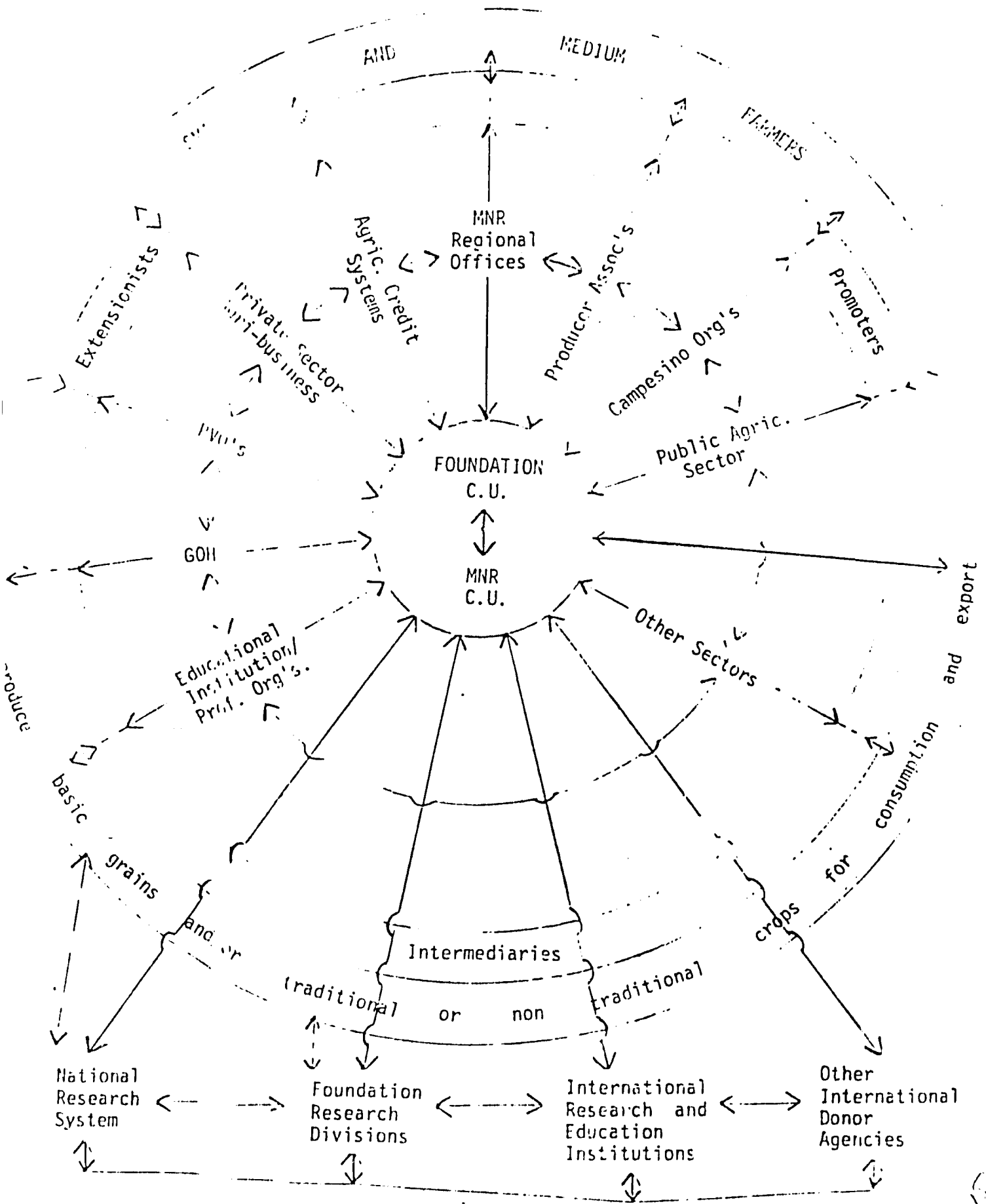
2. F.C.U. Functions

The general responsibilities of the F.C.U. are described briefly in Section II A. In more specific terms, the F.C.U. will:

- conduct studies of Foundation clientele demands and preferences;
- collaborate with MNR and other institutions in the dissemination system in conducting studies of farmer demands and preferences;
- assist Research Foundation staff in writing and editing; preparing graphs, illustrations and photographs for research papers, reports and other technical presentations;
- prepare materials for production in the various media targetted for a specific audience from technical information provided by research staff (usually in collaboration with and always with verification of content accuracy by research staff);
- produce and distribute printed, audio, graphic, and videotaped materials targetted for the Unit's specific direct audiences;

Figure 3

Agricultural Communications Network



- collaborate with the MNR C.U. in production of materials in the various media (including radio) for dissemination directly to farmers.

- collaborate with all institutions in the dissemination system in: pre-testing and conducting impact evaluations of materials produced by Unit; designing and conducting studies at the farmer level, particularly in areas in which research staff have an input (such as field days, on-farm adaptive research trials, demonstrations, publications, radio programming, etc.); developing, maintaining and operating a communication network linking together all audiences of both as appropriate;

- collaborate with Training Unit, Foundation research staff, and the MNR in organizing courses on technical agriculture for extension workers;

- collaborate with the Training Unit and MNR C.U. in planning, organizing and conducting communication-related training courses for research and extension staff;

- participate in planning, organizing and conducting special events organized by the Research Foundation such as field days, conferences, meetings, etc, coordinating as appropriate with the MNR.

In summary, although the F.C.U. will provide communication support directly to the Foundation in conjunction with other units of the Division, the greater part of its work will be done in collaboration with the other institutions actively participanting in the information dissemination system. Therefore, it will seek to involve the MNR C.U. in the three phases of planning, implementation and communication-related investigation and evaluation.

5. Relation to proposed AID/S&T Agricultural Communication Project

The proposed AID/S&T project on agricultural communications will, if approved, provide a much needed bridge between the Foundation and Extension, contribute to strengthening the capacity of Extension to disseminate information to small and medium farmers through providing support to a pilot project, and support an in-depth evaluation of the impact of the Foundation/MNR communication support program.

The purpose of the proposed AID/S&T project would be to develop and demonstrate more effective ways to use mass media and other communication methods to support technology development and transfer in agriculture. Honduras has been selected as one of the primary sites for the S&T project, and it would be implemented in collaboration with the Mission's Agricultural Research Project. S&T support would be in addition to the funding provided to the Research Foundation under the USAID/H project.

From the Mission perspective, the S&T project provides an opportunity to bridge research and extension communication activities, and to provide an additional level of technical assistance and evaluation, particularly in regard to MNR activity which cannot be funded under the Agricultural Research Project. From the Honduran perspective, it is seen as a facilitator for the integration of Foundation activities with related national research and extension activities.

The communication component of the Mission Agricultural Research Project and the proposed S&T project would be implemented as a single project encompassing both. Central funding would provide a long term (3 years) Senior Agricultural Communications Specialist to work with the MNR C.U. in strengthening its capacity to provide effective communication support to Extension and other public and private agricultural sector institutions, and to implement a pilot project (also supported by S&T funding) with the MNR to strengthen its information dissemination and feedback capacity in one region. (Danli has been tentatively selected as the pilot region). In addition to the long term specialist, S&T would also provide short term technical assistance, limited operational funds and equipment, and limited in-country training in support of the pilot project, and would fund an in-depth evaluation of the impact of the Foundation/MNR communication support program.

C. Administrative Analysis

1. Proposed Organizational Structure

The basic components of the proposed organizational structure for the Foundation are as follows:

a. A Governing Body, integrated by the General Assembly as the maximum authority; a Board of Directors and an Oversight Committee. The functions, responsibilities and number of people in each of these groups are described in the Statutes and By-Laws of the Foundation, approved in its inaugural meeting on May 14-15, 1984.

b. An Executive Directorate, headed by the Director General, as the officer principally responsible for planning, developing, implementing, and evaluating research, communications and administrative activities of the organization. The detailed functions and responsibilities of the Director General are also explained in the By-Laws.

c. The Planning-Implementation Level. This level is composed of the Directors for Research and Communication and Development, and the professional, scientific and research personnel up to the level of research assistants under the two offices mentioned above.

d. The External Advisory and/or Cooperating Institutions, which will participate in several ways in the Foundation's research, extension and/or training programs, such as the International Agricultural Research Centers, the Ministry of Natural Resources, and the various Schools of Agriculture in Honduras.

e. An Administration and Finance Area that has responsibility for accounting, audit, personnel services and maintenance, among other functions.

f. An Operational Level, including all supporting staff; secretaries, technicians, clerks, trainees, laborers, etc. (Figure 1).

In the technical, communication and administrative areas, the proposed arrangement will permit clear identification of the different ranks or levels of positions. Advancement into the next level will depend on the professional merits and seniority of the individual.

Figure 2 shows a proposed, basic, long range organizational structure for the Foundation. The number of personnel engaged in the different programs or activities will vary, of course, according to the needs of the research programs and the availability of financial resources. In the early years some of the levels or areas will not be implemented in order to simplify the operational structure. This alternative is illustrated in figure 3.

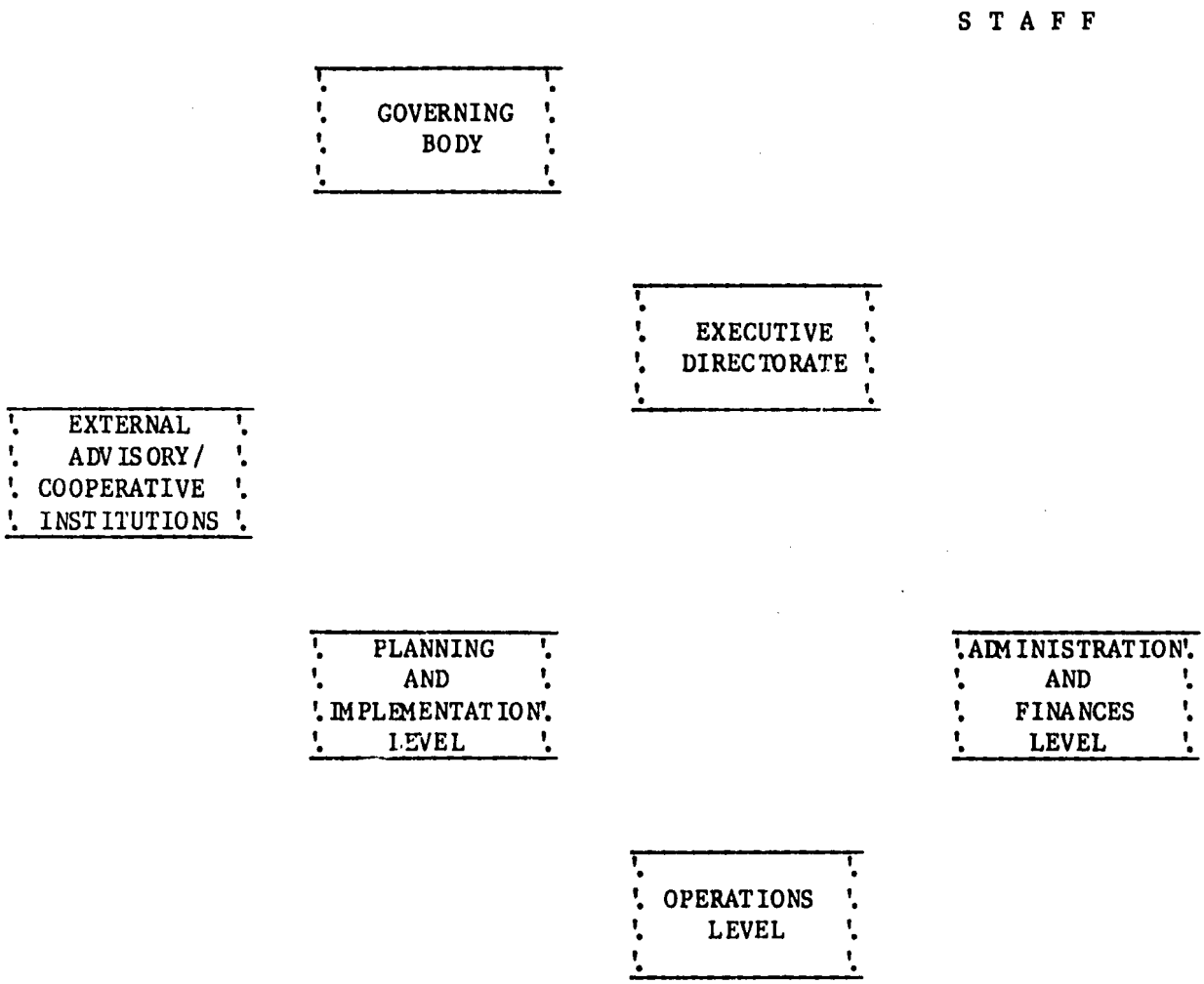


FIGURE I. MAJOR COMPONENTS OF THE PROPOSED ORGANIZATIONAL STRUCTURE FOR FHIA.

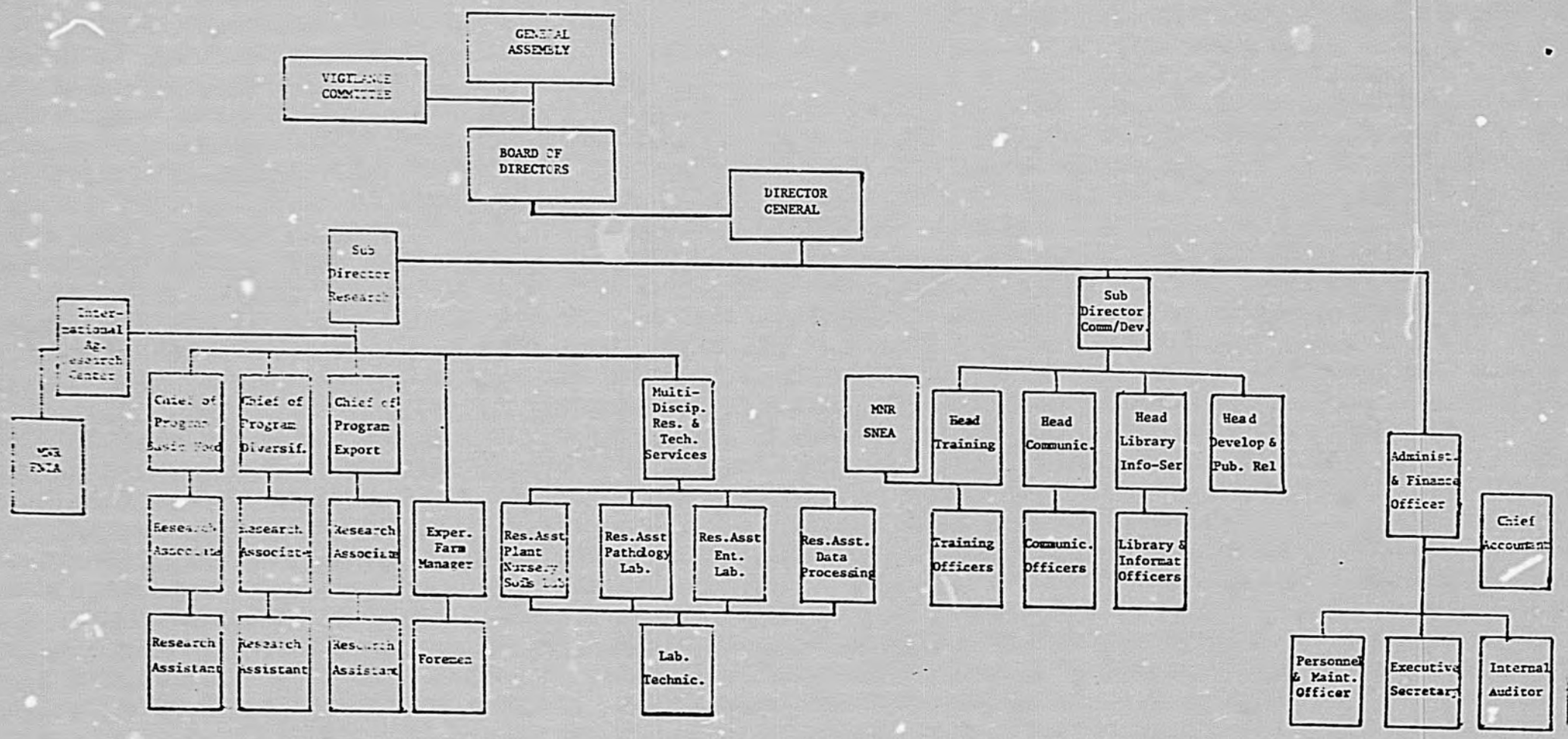


Figure 2 Long-range organizational structure for FHIA

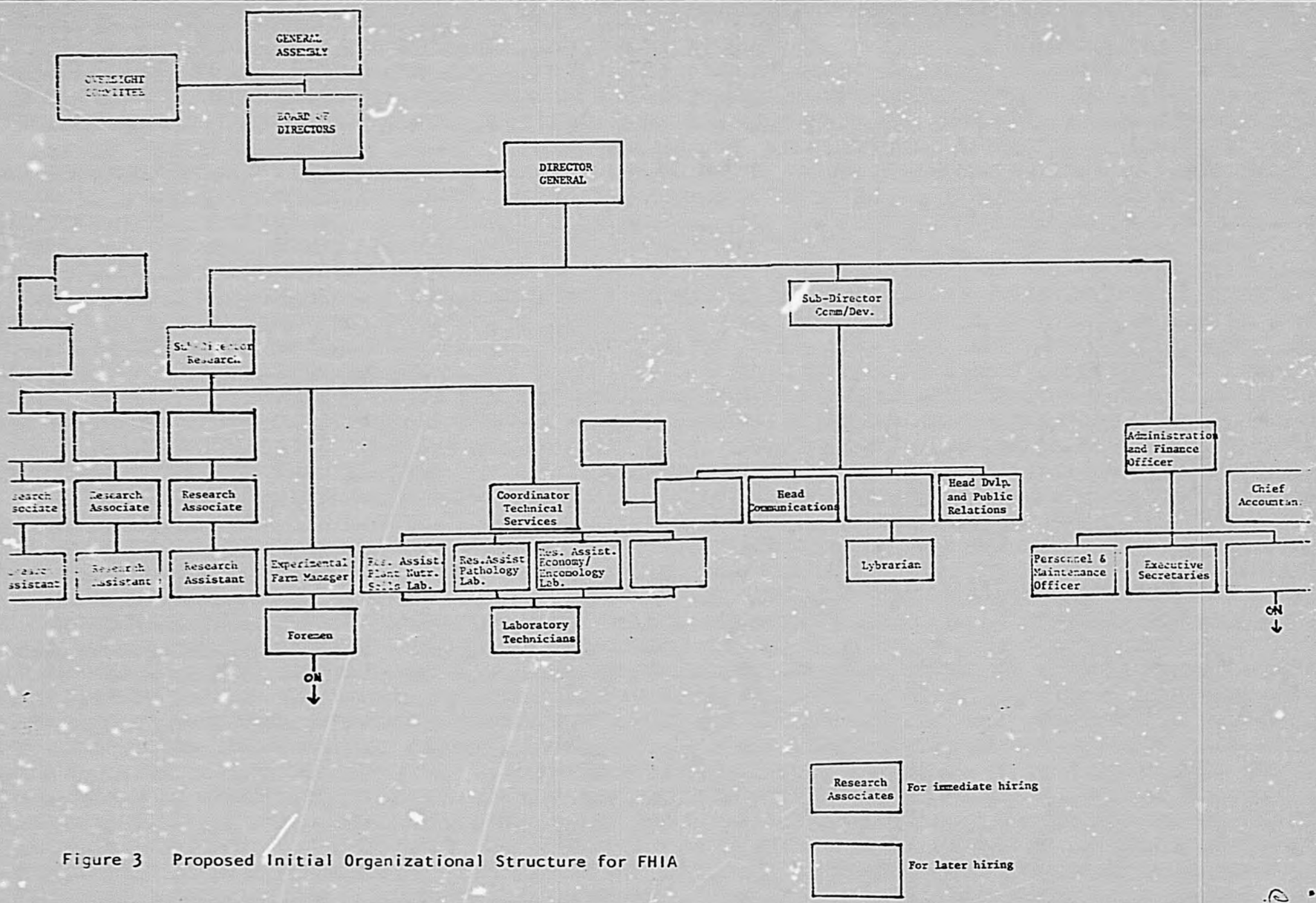


Figure 3 Proposed Initial Organizational Structure for FHIA

In the preceeding charts the lines of authority are shown by the vertical lines, starting with the Director General; the advisory and coordination activities are represented by the horizontal lines. Within the different levels, each individual must be carefully selected to conform with the qualifications required for each position, and the salary, benefits and allowances will be established accordingly. No distinction will be made on the basis of nationality for any position within of Foundation.

The diagram in figure 2 suggests a Chief of Project for each of the major commodity groups: Basic Food Crops, Non-Traditional Export Crops and Traditional Export Crops responsible to the Director of Research. This is suggested in order to have a complete integration of each commodity within each category or group. In this manner, the Director of Research will have only three chiefs of programs reporting to him. In addition, the arrangement by groups of commodities will facilitate the participation of the Multi-Disciplinary Research and Technical Analytical Services staff in a more efficient way enabling soil scientists, entomologists, pathologists, etc. to work on more than one project, if appropriate.

A Team Leader would be the principal scientist responsible for each individual crop. The Chief of Project may also be a crop team leader, or will at least participate actively in research.

The Research Associates, Research Assistants and the trainees will report to the Team Leader. Some of these could move up in the hierarchical ranks of the organization as they gain experience and skills.

Advisory and collaborative agencies, like the International Research Centers, will have direct communication with the Directorate of Research, particularly in connection with basic food crops. The same holds for the Ministry of Natural Resources since the Nacional Agricutlrual Research Program of that Ministry is responsible for research on those crops.

In the particular case of bananas, a research information linkage will be established with UPEB.

A Coordinator for Technical Analytical Services will also be under the Director of Research. This coordinator, i.e. senior chemist, agronomist or pathologist, will program and supervise all the services of the laboratories and data processing center. The analytical services unit will provide technical information to Foundation research projects and to the general public.

At the same time, the technical services will have a close relationship with the Directorate of Communications and Development, particularly on aspects related to the external projection of services to the public. These services will include soils and plant tissue analysis, pathology diagnosis, taxonomic and economic enthomology determinations, and data processing, under the regulations and procedures determined by the Director General and the Board of Directors.

Under the Directorate for Communications and Development, there will be the Heads of Offices of Communications, Training, Library and Information Services, and Development and Public Relations, with a series of sub-divisions. A detailed discussion of the organizational structure of this Directorate is presented under the corresponding chapter head.

The Administration and Finance area will be headed by the Administrative and Finance Officer, under whom the internal auditing, accounting, personnel services, purchasing and maintenance activities will be located. This office will assist the Directors of Research and Communications and the Director General, in the preparation of program budgets, and will be responsible for the elaboration of financial statements and planning, in accordance with the Statutes.

An external audit will be performed annually. The Oversight Committee may order and supervise any other audit as established in the Statutes.

2. Initial Operational Structure

The simplified organigram presented in figure 3 suggests what could be the initial organizational structure of the Foundation. At least the first year will be spent in the organization and establishment of the programs and facilities, selecting and acquiring the land for the experimental farm, building the installations, and conditioning the station for the various research programs. Therefore, only a selected number of scientists, technical people, and operational personnel will be hired during the initial period. This organigram will grow in a modular design as facilities and resources become available to establish new research programs and gradually build up the cadre of technical and administrative personnel who will complete the staff of the Foundation.

During the first five years studies on cacao and citrus, for example, will have to be done cooperatively on private farms, while the plantations at the central experimental farm are coming into production. For certain other crops (corn, beans, soybeans, cassava, melons, etc.) research must be done in different ecological areas in the country, El Zamorano and La Esperanza; this will require off-site facilities and personnel.

3. Land and Facilities

a. Presently Available

The Buildings at La Lima - Tropical Research Headquarters constitutes basically what the Foundation will receive under the United Brands donation. Laboratory equipment and supplies will be included in this donation. However, this will be insufficient to complete Foundation needs.

1) Land

Originally, the land to be donated to the Foundation included the 54 hectares of the banana breeding program, and 68 hectares at the western extreme of Guaruma II, next to Guaruma III. (see figure 4). Since this land appears not to be available for research in other crops in the immediate future, it is imperative that the Foundation have additional land to carry out the different field research programs. The Foundation, with the assistance of the GOH and AID, has identified several potential plots of land which are of sufficient size and possess other desirable characteristics (drainage, contigous, etc.) and has begun negotiations for purchase.

2) Buildings

Two of the assets that will be transferred to the Foundation are the set of buildings at La Lima Tropical Research headquarters (administration, library, offices, laboratories, annex, shops, greenhouse and separate offices and sheds). Other buildings included in the donation are those at the Guaruma II Banana Breeding Program; among them three houses, offices, greenhouse, shop and other small facilities. The central administration building and the Millstein building (agronomy) are in good condition. The other buildings will need some remodeling, repair and maintenance.

Many of the expenditures during the first year will be for farm land, laboratory equipment and supplies, buildings for housing and all the facilities at the new experimental farm, and the buying of vehicles and many other items. These items are discussed in more detail below.

b. Need for Additional Facilities

(i) Land

In order to be able to cover the range of basic food crops and diversification crops for non-traditional exports, the land requirements for the Foundations' central experimental farm will be 220 hectares.

Even though important research may have to be done in different locations representing the diverse agricultural ecosystems in the country, the central experimental unit will be the headquarters for research on several of the priority crops, on irrigation and drainage, cultural practices, pest control, nurseries, germplasm collection and other programs.

The following is a list of the most important characteristics considered as necessary for the Central Experimental Farm.

- Be representative of an extensive agricultural region (or regions) of the country in climate, soils, and production systems.

- Be uniform in soil conditional, including phosphate.
- Have adequate size (at least 220 ha.) in a contiguous lot.
- Have accessibility - for operation and for demonstration purposes.
- Have an adequate supply of irrigation and potable water.
- Have sources of labor near by, but be free from urban problems.
- Have access to utilities (electricity, water, sewerage, etc.) for housing, offices, laboratories, shops, etc.

In the particular case of cacao and citrus, for example, one or several private farms initially will have to be used as experimental sites since it will take three to four years before the plantations at the central experimental farm will be fully developed. Arrangements have to be made, also, for the corn and bean programs in the "ladera" (foothills) ecosystems, representative of most of the corn growing areas in the country.

Table 1 presents a tentative minimum distribution of the needed additional land for the central experimental farm, some of the lines of research that will be taken, and the location of alternate sites where certain research will have to be conducted. The minimum total area suggested for the central farm is 220 hectares, where at least 40 hectares will be assigned for screening and testing of other species with export potential.

(ii) Buildings and Installations

Assuming that the buildings at La Lima - Tropical Research will house the offices of the Director General, the Sub-Directors, the administration services, library, laboratories, offices for the research, communications and technical services staff and some of the housing for trainees, it will be necessary to build adequate facilities at the new experimental farm in order to carry on research in a proper and efficient manner.

The details and extension of the buildings and installations will depend on the size of the farm, its location and topography, and the services available; however, a tentative list of the required facilities is as follows:

Buildings Office annexes for the superintendent and part of the staff and trainees; library annnex; conference room; laboratory annex (soils and plant nutrition); meteorological station; greenhouses; housing for the foreman and some workers; storage; mechanic and carpentry repair shop; machinery sheds; dairy farm (pens, milking parlor). These buildings will need approximately 650 to 800 m2 of construction.

Installations Water pumping equipment for irrigation and domestic use; irrigation equipment including drip and overhead types (systems); electric substation (110-220); electricity distribution lines and transformers; sewerage system; water deposits; corrals; fuel deposits and pumping stations; roads.

196

TABLE 1 AREA NEEDED FOR THE CENTRAL EXPERIMENTAL FARM AT LA LIMA

CULTIVO	LINEAS DE INVESTIGACION	UNIDAD CENTRAL LA LIMA	OTRAS LOCALIDADES
CITRUS	Indexing, Pathology, Agronomy Practices, soil management, budding and grafting, pruning system, variety screening	20	
CACAO	Pathology, Cultural Practices, Collections, Post-harvest, pruning system, intercropping, fertilization	10	CUYAMEL LA MASICA
RICE	Water management, seed production, agronomic practices, pests and pathogens, soil management, cultivar screening	15	
CORN	Selection, Adaptation, Agronomic Practices, intercropping, soil management	5	COMAYAGUA HILLSIDES ZAMORANO
FORAGES AND PASTURES	Tropical Legumes evaluation, grazing systems, agronomic practices, grass/legume compatibility trials	100	
LEGUMES	Beans, soybeans, pulses collections, adaptation, agronomic practices, soil management, Biotechnology-BNF, rotations	10	ZAMORANO COMAYAGUA
OTHER CROPS	Potential of new crops, rotation soil improvement, variety screening	40	
FACILITIES	Buildings and installations	20	
TOTAL		220	

(iii) Services

A desirable location of the experimental farm will be one where services are available near by. Electricity sources (main lines), urban domestic water service, sewerage connections for disposal or treatment, public transportation, fuel and lubricants supply, are some of the services that must be provided to the farm. The more distant the services are, the more costly it will be to obtain them.

Besides those investments, consideration must be given to farm machinery and equipment, vehicles, tools, furniture, instruments and diverse materials from the beginning.

c. Manpower

The basic needs for human resources in the initial steps of the Foundation are summarized in figure 3, with the exception of part of the personnel within the operational level (clerks, laborers, workers, etc.). However, the decision on what commodities and what additional ecological sites are to be covered will be the basis for determining the exact manpower needs.

Emphasis should be given to a careful selection of the candidates to occupy the different positions available in the Foundation. A brief description of the qualifications of these candidates follows.

The Principal Research Scientist shall be an experienced scientist of recognized superiority in his field of specialization who has demonstrated a high level of ability in the planning, organization, and carrying out of research projects applicable to the tropics. He should hold the PhD degree or equivalent from an accredited institution and have had at least 10 years active research experience, five of which were obtained after he got his PhD degree.

The Associate Research Scientist shall be an experienced scientist of demonstrated initiative and dedication who is competent to plan and carry out research projects without supervision. He should hold the PhD degree or equivalent from an accredited institution and have had at least 7 years active research experience, three of which occurred after he obtained the PhD degree.

The Assistant Research Scientist shall be an individual of demonstrated initiative and dedication who has shown himself capable of performing research tasks with a minimum of supervision. He should hold the Master of Sciences degree or equivalent from an accredited institution and should have received advanced training at an International Agricultural Research Institution or University.

The Research Associate shall have served as a Research Assistant or have had equivalent experience in either the public or private sector for a period during which he shall have demonstrated interest, initiative and dedication in the performance of research tasks. He should have received the Ingeniero Agronomo, Agronomo or Perito Agronomo degree or equivalent from an accredited institution.

The Research Assistant (trainee) should be graduated from a recognized educational institution and should have demonstrated a sincere interest in and appreciation of agricultural research as a career. Preferably, he might be a Perito Agronomo, Agronomo or be a candidate for the Ingeniero Agronomo degree or equivalent.

(i) Lines of Authority

In figures 1, 2 and 3 lines of authority are represented vertically, starting with the Governing Body and the Director General, down to the Directors, the Chiefs of Projects, the Team Leaders and the associate and assistant personnel. Generally, the administrative and decision-making functions of the staff in research and communiations will decrease in proportion to the level of the position. Nevertheless, an outstanding scientist, for example, may reach salary status equivalent to that of a Director, without having significant administrative responsibilities, based only on his professional productivity and seniority. This is an incentive that will help to retain the best research people on a continuous, long term basis. Under this structure there is opportunity for research scientists to move up in the salary scale without holding administrative responsibilities which could interfere with their research activities.

The at-large participation of research personnel is desirable when feasible. As work load permits, certain specialists such as entomologists, soil scientists, economists, pathologists and water management experts may lend assistance to other projects. This will allow a more cost-effective structure and stimulate inter-disciplinary participation. The Chief of Program, in accordance with the Team Leader for each commodity, will determine when this participation could be desirable.

For the first year or two the staff under Communications and Development will consist only of the Sub-Director, the Head of Development and Public Relations, the Head of Communications and the Librarian. The Training and Information Services staff will be hired at a later date, once the research programs are under way. However, the research and extension cooperation with the Ministry of Natural Resources will not start immediately.

On the other hand, the functioning of the Technical Analytical Services could continue almost immediately, assuming that enough laboratory equipment and materials are available, and that at least part of the Tropical Research/SIATSA staff would continue with the Foundation.

(ii) Salary Scale

The suggested scale of salaries for the main components of the Research, Communications and Administrative areas have been adapted from those currently in operation in several international organizations, in an attempt to make them attractive, to provide the opportunity for promotion and to assure

continuity in the programs. This suggested scale of base salaries is presented in Table II, including the main positions and examples of jobs at different levels within each position.

At the lower operational levels (clerks, laborers, etc.), salaries will be comensurate with those normally paid in the region or regions where the research sites will be located, and those established by law.

Benefits for the personnel will include those normally adopted by international agricultural research centers, including health care for medical and hospitalization expenses; life insurance plan; long term disability; retirement plan, vacations, and other that the Board of Directors and the labor laws of Honduras establish. Some allowances could be granted for expatriate personnel in the form of home leave, moving expenses, and housing when justified.

Table III describes the positions, time and salary for the personnel needed for some selected crops under different groups, the estimated total (personnel) costs of managing the diverse research programs, the technical analytical services and the central experimental farm and possible substations in the El Zamorano and La Esperanza regions.

Considering the annual salaries suggested for research in Table II, the budget for personnel and for the Foundation would add up to $683,600.00, the first year of which $310,700.00 (45%) would correspond to the traditional export crops; $174,900.00 (25.6%) to the non-traditional export crops and $198,000.00 (29%) to the basic food crops programs.

Salaries for programs other than research, would initially total $353,300.00 divided as follows: $121,200.00 for Technical Annalytical Services, $107,000.00 for Administration and Finances, $82,000.00 for Communications and Development and $43,100.00 for the Central Experimental Farm.

As these tentative figures indicate, the budget for personnel only, during the first year of the Foundation, would be $1,036,900.00; this would cover 48 professional staff members at different levels and 74 support workers at the operations levels.

TABLE II PROPOSED SALARY SCALE FOR FHIA
(U.S. DOLLARS X 1000)

CODE	POSITION	LEVEL	RESEARCH PROGRAMS	COMM. DEVEL. PROGRAMS	TECHNICAL SERVICES	ADMIN/FINANCES OFFICE	ANNUA SALAR
GD	GENERAL DIRECTOR						75
	$60,000 base salary	1					
DP	DIRECTOR						
	$50,000	1	Director Research				62
	45,000 (top $50K)	11	Ppal.Research Scient.				62
PRS	PPAL. RESEA. SCIENTIST						
	$42,500	1	Chief of Project	Director Comm/Devel.			47
	40,000	11	Team Leader				42
	38,500 (top $50K)	111	Ppal. Res. Scientist				42
ASOR	ASSOC. RESEA. SCIENTIST						
	$37,500	1	Assoc. Res. Scientist		Coordinator	Principal Officer	36
	35,000	11	Assoc. Res. Scientist		Ppal.Res.Chem/Agro/Path		27
	33,500	111	Assoc. Res. Scientist	Head of Office	Assoc.Chem/Agro/Path	Accountant	23
ASTR	ASS.RESEARCH SCIENTIST						
	$32,000	1	Asst. Res.Scientist	Librarian/Ing.Serv.	Chem./Agro./Data Proc	Superint.Exp.Farm	14
	31,500	11	Asst. Res.Scientist	Train/Comm.Officers		Senior Exec.Bil.Secre	12
	29,000	111				Internal Auditor	10
RASO	RESEARCH ASSOCIATE						
	$26,500	1	Res. Associate			Exe. Biling. Secret	9
	24,000	11	Res. Ass. (Adv. train)		Lab. Technician	Foremen Biling.Secret	8
RAST	RESEARCH ASSISTANT						
	$21,000	1	Res. Assist. (BS level)				6
	17,500	11	Res.Assist.(Sub BS Level)				5

TABLE III PERSONNEL NEED ACCORDING BY POSITION, DISCIPLINE, TIME AND SALARY per 1,000 Dollars

ANNUAL SALARY	GROUP	CROP	POSITION	DISCIPLINE	% TIME	AREA HA.
	EXPORT	CACAO	Team Leader	Horticulturist/ cacao/breeder	100	10
			Research Scientist	Plant Pathologist	50 (a)	
			Assistant Research Scientist	Econ Entomology	50 (a)	
			Research Associate	Agronomist/soil scientist	100	
			Research Assistant	Agronomist/soil scientist	50 (a)	
			Associate Research Scientist	Econ Entomology	50 (a)	
			Operations	Laborers (6)	100	
		COFFEE	(Same as Cacao)			External
			Research Associate	Plant Pathologist	50 (a)	
			Research Assistant	Entomologist	50 (a)	
		CITRUS	Team Leader	Horticulturist/Pomologist	100	20
			Associate Research Scientist	Plant Pathologist	50 (a)	
			Associate Research Scientist	Econ Entomology	50 (a)	
			(2) Research Assistant	Horticulturist/ Agronomist and/or soil Scientist	100	
			Research Assistant	Weed Specialist	50 (a)	
			Operations	Laborers (6)	100	
		VEGETABLES	Team Leader	Horticulturist	100	10
			Assistant Research Scientist	Horticulturist	100	
			Assistant Research Scientist	Econ Entomology	50 (a)	
			Associate Research Scientist	Plant Pathology	50 (a)	
			Research Associate	Weed Scientist	100	
			Research Assistant	Entomologist	100	
			Research Assistant	Plant Pathologist	100	
			Operation	Laborers (6)	100	

TABLE III PERSONNEL NEED ACCORDING BY POSITION, DISCIPLINE, TIME AND SALARY

Dollars per 1,000

BUDGET FOR PERSONNEL F.H.I.A.

ANNUAL SALARY	GROUP	CROP	POSITION	DISCIPLINE	% TIME	AREA HA.
	DIVERSIFICATION	PEJIBAYE	Team Leader	Agronomist/Pomologist	100	10
			Research Associate	Agronomist/Soil Scientist	50 (a)	
			(2) Research Assistant	Agronomist/Soil Scientist	100	
			Operations	Foreman	100	
			Operations	Laborers (12)	100	
		SPICES	Team Leader	Horticulturist/Agronomist	100	20
			Assistant Research Scientist	Plant Pathologist	50	
			Associate Research Scientist	Plant Explorer/Econ.Botanist	50 (a)	
			Research Assistant	Econ. Entomology	50 (a)	
			Research Assistant	Horticulturist	100	
			Research Associate	Plant Pathology	50 (a)	
			Operations	Grafter	100	
			Operations	Laborers (6)	100	
	BASIC	CORN/SORGHUM	Team Leader	Agronomist	100	10
			Research Associate	Plant Breeder	100	
			Research Assistant	Plant Breeder	100	
			Research Assistant	Agronomist	100	
			Research Assistant	Agronomist	100	
			Operation	Laborers (6)	100	

BUDGET FOR PERSONNEL F.H.I.A.

ANNUAL SALARY (Accum)	GROUP	CROP	POSITION	DISCIPLINE	% TIME	AREA HA.
		BEANS	Team Leader	Production Agronomist	100	(External)
			Research Associate	Agronomist/Soil Scientist	100	
			Research Assistant	Agronomist/Soil Scientist	100	
			Operations	Laborers (2)	100	
	DIVERSIFIC.	PASTURES, FORAGES, GREEN MANURS AND MULCHES	Team Leader	Agronom./Range Mgt.Spec.	100	80
			Research Associate	Animal Nutrition/ Livestock Management	100	(External)
			Associate Scientist	Plant Explorer/Econ.Botanist	50 (a)	
			Operation	Laborers (2)	100	
	EXP. FARM	ALL	Superintendent	Agronomist	100	
			General Foreman		100	
			Mechanic	Services	100	
			Maintenance Chief		100	
			Operations	Tractor Driver (3)	100	
			Operations	Laborers (4)	100	
	MULTI-DISCIPLINARY RESEARCH AND TECH. ANAL. SERVICES	All	Coordinator	Agro/Path/Chem.	100	
			Research Assistant	Weed Specialist	50	
			Research Assistant	Agro. Plant Nutrition	100	
			Research Assistant	Agro. Soils	100	
			Research Assistant	Entomologist	100	
			Laboratory Technician	Plant Nutrition	100	
			Laboratory Technician	Soils	100	
			Laboratory Technician	Pathologist	100	
			Research Assistant	Data Process Officer	100	
			Research Assistants	Analytical laboratories(6)	100	
			Clerks	-(2)	100	
			Laborers	Analytical laboratories(4)	100	

ANNUAL SALARY	GROUP	CROP	POSITION	DISCIPLINE	% TIME	AREA HA.
	MULTI-DISCIPLINARY		Team Leader	Agronomist, Soil Scientist, Econ. Botanist	100	
			Research Scientist	Plant Pathologist	(100)	
			Associate Scientist	Plant Pathologist	(100)	
			Research Associate	Plant Pathologist	(100)	
			Associate Scientist	Econ. Entomologist	(100)	
			Assistant Scientist	Econ. Entomologist	(100)	
			Research Assistant	Entomology	(100)	
			Associate Scientist	Plan Exploration/ Econ. Botany	(100)	
			Research Associate	Agronomy and Soils	(100)	
			Research Assistant	Weed Science/Specialist	(100)	
			Associate Scientist	Market Economics	100	
			Associate Scientist	Economic Analysis	100	
			Assistant Scientist	Statistical Design/Analysis	100	
			Associate Research Scientist	Post-Harvest foods loss Management and Product Processing	100	
	COMM/DEVEL.	Sub.Directio	Sub-Director	Commercial Specialist	100	
			Head of Department	Library & Inf. Services	100	
			Head of Department	Develop & Pub. Relations	100	
			Librarian	Librarian	100	

ANNUAL SALARY	GROUP	CROP	POSITION	DISCIPLINE	% TIME	AREA HA.
	ADM/FINANCES	ADM/MGT	Principal Officer	Administrative/Finances	100	
			Chief Accountant	Accounting	100	
			Accountant	Accounting	100	
			Execu. Bilingual Secret. 3		100	
			Secretaries 3		100	
			Receptionist	Switchboard/Telex	100	
			Maintenance	Janitors (4)	100	
			Maintenance	Watchmen (2)	100	

Footnotes:

a) specialists posted to activity areas for specific tasks but assigned to the Division for Multi-Disciplinary Research and Technical Analytical Services.

b) Specialists assigned to the Multi-Disciplinary Research Section and who appears in two of the activity areas listed above for work on a less-than-full-time basis.

D. Economic Analysis

I. INTRODUCTION

The capacity to develop and manage technology in a manner consistent with a nation's physical and cultural environment is the single most important factor accounting for differences in agricultural productivity among countries.1/ That capacity, in turn, is dependent in part on the existence of well-functioning institutions to generate and transmit agricultural research results to farmers. Since the mid-1950's numerous studies have examined the impacts of agricultural research, extension, and education on productivity and output growth for a wide range of commodities and countries. The vast majority of these studies have indicated high rates or return to public investment in agricultural research. The results of several of these studies as listed in Table 1. For example, Marletta (1970) estimated an annual real rate of return of 45-93% for crop research in Mexico. Ayer and Schuh (1972 obtained an estimated return of 77-110% for cotton in Brazil; Hines (1972) a 35-55% return for maiz in Peru; Wennergren and Whitaker (1977) a return of 44% for sheep in Bolivia; Scobie and Posada (1978) a return of 79-96% for rice in Colombia; and Hertford, Ardila, Rocha, and Trujillo (1977) a return of 60-82% for rice, 79-96% for soybeans, 11-12% for wheat, and none for cotton in Colombia. Most of these rates of return are well in excess of the 15-20% returns which private firms would consider necessary for investments with similar risk levels.

Due to the difficulty of maintaining proprietary rights to research produced in underdeveloped countries, private firms lack an assured incentive to undertake sustained substantive research in countries such as Honduras. It is likely that this was one factor influencing United Brands to reduce its research efforts on bananas. Even if it were to continue to invest $300-400,000 per year on banana breeding research to eliminate Black Sigatoka, once a resistant variety is developed, it would be available to all firms producing bananas.

1/ Ruttan, V. W. Agricultural Research Policy, University of Minnesota Press, Minneapolis, 1982

TABLE 1. SUMMARY STUDIES OF AGRICULTURAL RESEARCH PRODUCTIVITY.

Study	Country	Commodity	Time Period	Annual Internal Rate of Return (%)
Index Number:				
Griliches, 1985	USA	Hybrid corn	1940-1955	35-40
Griliches, 1958	USA	Hybrid sorghum	1940-1957	20
Peterson, 1967	USA	Poultry	1915-1960	21-25
Evenson, 1969	South Africa	Sugar cane	1945-1962	40
Barletta, 1970	Mexico	Wheat	1943-1963	90
Barletta, 1970	Mexico	Maize	1943-1963	35
Ayer, 1970	Brazil	Cotton	1924-1967	77+
Schmitz and Seckler, 1970	USA	Tomato harvester, with no compensation to displaced workers	1958-1969	37-46
		Tomato harvester, with compensation of displaced workers for 50% of earnings loss.		16-28
Ayer and Schuh, 1972	Brazil	Cotton	1924-1967	77-110
Hines, 1972	Peru	Maize	1954-1967	35-55
Hayami and Akino 1977	Japan	Rice	1915-1950	25-27
Hayami and Akino, 1977	Japan	Rice	1930-1961	73-75
Hertford, Ardila, Rocha and Trujillo, 1977	Colombia	Rice	1957-1972	60-82
		Soybeans	1960-1971	79-96
		Wheat	1953-1973	11-12
		Cotton	1953-1972	none
Pee, 1977	Malaysia	Rubber	1932-1973	24
Peterson and Fitzharris, 1977	USA	Aggregate	1937-1942	50
			1947-1952	51
			1957-1962	49
			1957-1972	34
Wennergren and Whitaker, 1977	Bolivia	Sheep	1966-1975	44
		Wheat	1966-1975	-48
Pray, 1978	Punjab (British India)	Agricultural research and extension.	1906-1956	34-44
	Punjab (Pakistan)	Agricultural research and extension	1948-1963	23-37

TABLE 1 cont'd

Study	Country	Commodity	Time Period	Annual Internal Rate of Return (%)
Index Number:				
Scobie and Posada, 1978	Colombia	Rice	1957-1964	79-96
Pray, 1980	Bangladesh	Wheat and rice	1961-1977	30-35
Regression Analysis:				
Tang, 1963	Japan	Aggregate	1880-1938	35
Griliches, 1964	USA	Aggregate	1949-1959	35-40
Latimer, 1964	USA	Aggregate	1949-1959	not significant
Peterson, 1967	USA	Poultry	1915-1960	21
Evenson, 1968	USA	Aggregate	1949-1959	47
Evenson, 1969	So. Africa	Sugar cane	1945-1958	40
Barletta, 1970	Mexico	Crops	1943-1963	45-93
Duncan, 1972	Australia	Pasture Improvement	1948-1969	58-68
Evenson and Jha, 1973	India	Aggregate	1953-1948	40
Cline, 1975 (revised by Knutson and Tweeten, 1979)	USA	Aggregate	1939-1948	41-50
		Research and extension	1949-1958	39-47
			1959-1968	32-39
			1969-1972	28-35
Bredahl and Peterson, 1976	USA	Cash grains	1969	36
		Poultry	1969	37
		Dairy	1969	43
		Livestock	1969	47
Kahlon, Bal, Saxena, and Jha, 1977	India	Aggregate	1960-1961	63
Evenson and Flores, 1978	Asia--national	Rice	1950-1965	32-39
			1966-1975	73-78
	Asia--Internat'l	Rice	1966-1975	74-102
Flores, Evenson, and Hayami, 1978	Tropics	Rice	1966-1975	46-71
	Philippines	Rice	1966-1975	75
Nagy and Furtan, 1978	Canada	Rapeseed	1960-1975	95-110
Davis, 1979	USA	Aggregate	1949-1959	66-100

TABLE 1 cont'd

Study	Country	Commodity	Time Period	Annual Internal Rate of Return (%)
			1964-1974	37
Evenson, 1979	USA	Aggregate	1868-1926	65
	USA	Technology oriented	1927-1950	95
	USA	Science oriented	1927-1950	110
	USA	Science oriented	1948-1971	45
	Southern USA	Technology oriented	1948-1971	130
	Northern USA	Technology oriented	1948-1971	93
	Western USA	Technology oriented	1948-1971	95
	USA	Farm management research and ag extension	1948-1971	100

Source: Ruttan, V. W. Agricultural Research Policy, University of Minnesota Press, Minneapolis, 1982.

Historically, publicly supported agricultural research in Honduras has lagged far behind the rest of the world in terms of its growth rate of scientific staff and research expenditures as a percent of agricultural gross domestic product. A survey of 41 less developed countries showed only 4 countries with negative growth rates in scientific staff during the 1970's. Honduras was one of those with a -1.82% rate of change in scientifc staff. It also had the lowest level of expenditures on public agricultural research as a percent of agricultural gross domestic product (0.16 percent) of all 41 countries.3/

3/ Private research expenditures, particularly for bananas, have been substantial in Honduras.

D.5

Table 2. Forty-one countries arranged in order of growth rates of scientific staff, 1970/80.

Countries	Growth rate of staff	Expenditures as % of Ag. GDP	Growth rate of Ag. GDP 1970-1979 1/	Income Group
Bangladesh	33.32	0.48	1.9	Low
Malaysia	21.90	0.81	5.0	Middle
Togo	20.74	0.76	0.3	Low
Nigeria	17.27	0.70	-0.3	Middle
Ecuador	16.11	0.35	0.7	Middle
Sri Lanka	15.12	0.41	2.6	Low
Indonesia	14.78	0.44	3.6	Middle
Thailand	14.66	0.26	5.4	Middle
Guatemala	14.18	NA	5.1	Middle
Uruguay	13.35	0.59	0.2	High
Tanzania	11.34	0.35	4.9	Low
Syria	9.70	0.24	6.4	Middle
Nicarauga	8.82	0.27	4.2	Middle
El Salvador	8.44	0.17	3.2	Middle
Senegal	8.17	1.21	3.6	Low
Brazil	7.49	1.15	5.0	High
Paraguay	7.13	0.28	6.8	Middle
Chile	6.82	0.81	3.5	High
Kenya	6.48	1.08	5.4	Low
Peru	6.26	0.33	0.1	Middle
Bolivia	5.48	0.34	3.1	Middle
Sudan	5.46	0.57	2.7	Low
Mexico	5.16	0.65	2.2	High
Jordan	4.93	0.44	NA	Middle
Cyprus	4.85	1.12	NA	High
Zaire	4.85	0.20	1.2	Low
Burundi	4.47	0.81	1.8	Low
Venezuela	3.55	1.32	3.8	High
Zambia	3.39	0.80	2.3	Middle
Nepal	3.23	0.20	0.8	Low
Philippines	3.19	0.16	4.9	Middle
Barbados	2.82	1.36	NA	High
Korea, Rep.	2.67	0.23	4.8	Middle
India	2.25	0.29	2.1	Low
Costa Rica	1.56	0.24	2.6	High
Argentina	1.05	1.64	2.5	High
Panama	0.30	0.53	2.2	High
Magadascar	-0.64	0.39	0.1	Low
Honduras	-1.82	0.16	1.3	Middle
Jamiaca	-3.65	2.16	1.3	Middle
Colombia	-6.23	0.67	4.8	Middle
AVERAGE	6.10			

1/ Agricultural GDP growth rates for 1970-1979 taken from World Bank 1981 World Development Report.

Source: Oram, P.A. and V. Bindlish, Resource Allocations to National Agricultural Research Trends in the 1970's. ISNAR, IFPRI, 1981.

It is little wonder that the production of major food commodities, particularly corn, soybean, beans and plantains have stagnated since 1970 as well (Table 3). It is estimated that 70% of the population suffers from malnutrition.

At the same time that production and the capacity to improve agricultural productivity has stagnated, population has grown at an annual rate in excess of 3% per annum. As a result, Honduras has moved from a net corn exporter to a point where it can no longer meet domestic demand. This situation is compounded by the recent weakness in the banana market which along with other factors has reduced the foreign exchange available to import food. If one looks to the future and assumes that population grows at about 3.3% per year, per capita income growth at a very modest 1.0 - 1.5% per year with an income elasticity of 0.7, the projected rate of growth in demand for food would be at least 4% per year. 4/ This figure indicates the extreme importance of increasing basic food production as well as developing exports to generate stable foreign exchange earnings to meet food import requirements.

Without increases in Honduran agricultural production, substantial upward pressure would be exerted on domestic food prices which, in turn, would reduce the rate of growth of economic development and employment in the industrial sector. It is the lowest income groups that spend the highest proportion of their income on food and experience the highest rates of unemployment. Consequently, these would be the hardest hit groups.

4/ The rate of growth in demand for food equals the rate of growth of population plus the product of the income elasticity of demand for food and the rate of growth of per capita income.

Table 3. HONDURAS: Production by commodity, value and indices of agriculture and food production, annual 1971-80.

COMMODITY	PRICE WEIGHT DOLLARS	AVERAGE 1969-71	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
		1,000 METRIC TONS										
Rice, paddy	128	8	13	16	17	19	29	57	42	42	51	41
Corn	62	345	351	290	350	335	334	308	332	423	343	359
Sorghum	56	47	47	35	36	38	53	42	35	51	37	34
Beans, dry	167	55	55	35	48	55	43	45	35	44	38	38
Sugar cane	6	963	983	969	937	1,049	1,006	1,204	1,367	1,823	2,046	2,305
Tobacco	1,007	2	3	3	4	4	6	7	7	7	8	8
Cotton	478	4	2	4	5	5	7	11	11	8	8	6
Cottonseed	48	8	6	12	14	8	11	17	18	12	14	10
Bananas	58	1,360	1,537	1,388	1,364	1,181	852	1,074	1,235	1,338	1,400	1,400
Coffee	670	38	42	51	47	54	51	54	62	70	70	76
Cattle exports 1/,2/	61	10	5	9	3	2	30	30	55	60	100	50
Beef and veal	315	32	38	39	42	35	41	47	44	51	61	57
Pork	848	5	5	6	5	9	9	10	10	10	11	11
Milk	126	150	153	159	165	175	180	187	190	196	202	208
Eggs	716	15	16	17	18	17	18	19	19	20	20	20
Aggregates of Production:		MILLION DOLLARS AT CONSTANT PRICES										
Crops		149.1	162.7	153.8	157.2	152.3	134.0	155.1	168.3	188.6	189.7	193.7
Livestock		44.6	47.3	50.1	51.3	53.0	57.9	62.3	63.3	67.3	74.4	70.9
Total Agriculture		193.7	210.0	203.9	208.5	205.3	191.9	217.4	231.6	255.9	264.1	264.0
Total Food		164.0	177.9	164.8	170.6	162.7	148.4	168.9	177.8	198.2	204.8	202.1
Indices of Production		(1969-71 = 100)										
Crops		100	109	103	105	102	90	104	113	126	127	130
Total Agriculture		100	108	105	108	106	99	112	120	132	136	136
Total Food		100	108	100	104	99	90	105	108	121	125	123

Table 3 cont'd

COMMODITY	PRICE WEIGHT DOLLARS	AVERAGE 1969-71	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
		1,000 METRIC TONS										
Per Capita Agriculture	100	105	99	98	94	85	93	96	103	102	99	
Per Capita Food	100	105	95	95	88	77	85	87	94	94	89	
Index of Population:												
1969-71 Popul. = 2,645,000		100.0	103.0	106.3	109.8	113.3	116.9	120.7	124.6	128.6	133.2	138.0

1/ In 1,000 head.
2/ Average price per head.

Source: USDA, World Indices of Agricultural Food Production, ERS Statistical Bulletin 669, 1981.

II. KEY ECONOMIC ISSUES WITH RESPECT TO RESEARCH RESOURCE ALLOCATION IN THE HONDURAN AGRICULTURAL RESEARCH FOUNDATION.

An evaluation of projected impacts of research undertaken by the Honduran Agricultural Research Foundation must attempt to answer three questions: (1) What are the chances of producing new knowledge or technologies if resources are allocated to particular commodities or problem areas. (2) What will be the demand for that knowledge or technology, and (3) What would be the value to society of that knowledge or technology? Scientists knowledgeable about the different areas of research must help answer the first question while economic theory and methods must be brought to bear on the second. The second also requires knowledge of the socio-economic characteristics of Honduran farmers as well as credit, pricing, exchange rate, and other public policies in Honduras, and the strength of foreign markets for particular commodities. The third question also requires the specification of criteria against which the evaluation will be made; for example, income and employment generation for different groups, nutritional impacts, foreign exchange generation, etc. In the next section, answers to questions posed to scientists and other persons knowledgeable about Honduran agriculture are combined with economic theory and methods to estimate the level and distribution of benefits to research which might be undertaken by the Foundation. A brief discussion is included on key factors affecting the demand for research in Honduras. First however, several points are made below about the determinants of the level and distribution of benefits to agricultural research in Honduras.

The probability of successful research is a major determinant of expected research benefits along with the timing with which results can be expected. Benefits received today are worth more than the same level of benefits received in the future. The amount of basic and applied research results available in Honduras, in other countries, and in the international agricultural research centers which can be utilized by the Foundation in an adaptive research program will greatly affect the timing and level of benefits from Foundation research.

Once research results are forthcoming from the Foundation, adoption or geographical spread of those results is obviously a critical determinant of benefits. The greater acreage planted to and value of production of a particular crop, the greater the benefits. Adoption of research results is affected by many factors. A well-functioning extension system can speed up adoption. The demand for research results depends on the availability of credit, inputs, markets, and remunerative prices for the commodities. For example, new technologies frequently require investments in inputs such as fertilizer or pesticides which require credit, overvalued exchange rates reduce the demand for export crops, and pricing policies can encourage or discourage adoption of research results.

The distribution of research benefits between producers and consumers and between rural and urban areas is affected by price responsiveness to change in production costs. Early adopters of research will gain economic benefits in most cases, but for markets characterized by very inelastic demand, these may

be the major gains received by producers because widespread adoption leads to subsequent price reductions. In this case, consumers reap the benefits. Corn in Honduras is an example of a crop characterized by relatively inelastic demand. In this case the benefits of increases in productivity will be captured largely by consumers especially poor consumers who spend a high proportion of their income on food. Benefits will be captured by farmers mainly to the extent that they are also consumers (except for early adopters). Not only do lower or stable corn prices benefit consumers directly, they relieve pressure on wages which can stimulate industrial development and employment. Also, to the extent that Honduras would be importing corn as demand increases over time, productivity gains resulting from research save foreign exchange and tax revenues which benefits the economy and taxpayers. Furthermore, this would reduce price responsiveness to increases in domestic production and shift more of the benefits to producers.

For export commodities such as bananas, citrus, and cacao, demand is likely to be relatively price elastic. In these cases, producers will receive a large share of the benefits. This may stimulate increased employment in the rural sector as long as the new technologies are not labor displacing by nature. They also will generate foreign exchange.

The payoffs to research are proportional to size of farm, and to that extent, research on export crops benefits large farms relatively more than small farms. Research on basic grains may benefit small farmers relatively more because small farmers consume a sizable amount of their basic grain production. Also certain technologies, especially mechanical, require large farms for adoption. Others, particularly biological innovations, are relatively scale neutral and can be used on any size farm. Given the labor surplus in Honduras, research should attempt to generate new technologies which utilize labor, although some work may be needed on technologies to substitute for labor during planting when there appears to be a labor shortage.

Another distributional issue concerns the access to markets and credit. If access to markets and credit is unequal and technologies require more of each, they may have a regressive impact on income distribution in the rural sector. Because most agricultural technologies are of this nature, it is critical that Honduras devote attention to improving credit and marketing systems to reap widespread benefits from agricultural research.

Finally, distributional consequences across regions should be recognized. For example, new corn technologies which could be utilized by farmers only in the tropical lowlands would benefit those farmers at the expense of farmers in the high mountain regions.

III. QUANTITATIVE AND QUALITATIVE ASSESSMENT OF EXPECTED FOUNDATION IMPACTS.

The new Honduran Agricultural Research Foundation will conduct research on three types of commodities: traditional export crops, non-traditional export crops, and basic grains. An attempt is made here to quantitatively and qualitatively assess the level and distribution of research benefits which might be expected. For the quantitative analysis, a single commodity is examined for each of the three commodity groups, and the impacts on aggregate basic grains are also projected. The results of this analysis are crude at best because the output of research is inherently uncertain and because elasticities and the timing and spread of research results are difficult to assess. Nonetheless, estimated net economic gains in the aggregate and for producers and consumers are provided below along with information on their sensitivity to changes in assumptions. The individual commodities chosen for analysis are bananas, citrus, and corn. Rates of return to Foundation research expenditures on these commodities are projected and qualitative assessments of impacts on employment, improvements in product quality, nutrition, industrial development, foreign exchange, and linkages to the international agricultural research centers are provided.

The first step involved in quantitatively assessing the effects of agricultural research is to project cost reductions or yield increases resulting from research generated technologies. These changes then must be spread over the appropriate number of acres and years.

For citrus, it is assumed that research by the Foundation will result in no change in yield in the first and second year, but will increase yield by 3 percent in the third year for the producers adopting research results, with a similar increment in each of the following years through year 15. Yields decline gradually from years 15 to 20 as insects and diseases evolve or are introduced from other countries. However, two-thirds of the citrus growers are assumed to adopt research results. Citrus acreage is assumed to expand by 500 hectares per year from the current 5,000 hectares up to 10,000 hectares by year 10.

For bananas, it is assumed that the current breeding program aimed at developing a variety resistant to black Sigatoka is maintained and will result in a variety release in year 10. Adoption will occur over the following three years. Total production costs are reduced by $3 million in year 11, $7 million in year 12, and $10 million in year 13. Furthermore, production increases by 180,000 quintals in year 11; 420,000 in year 12; and 600,000 in year 13. It is assumed that yields gradually decline from year 14 to 20.

For corn, yield is assumed to remain constant in year one and increase by 1% in year two and 2% in year three with additional annual increments of 2% from the base year level through year 14 for farmers adopting research results. Yields decline gradually from year 15 to 20. It is assumed, however, that research results are adopted on only 20% of Honduran corn acreage. The same yield and adoption assumptions are made for basic grains as a group.

The yield and adoption assumptions described above are combined with information on initial prices and quantities as well as estimated demand and supply elasticities to assess net economic benefits from the Honduran Agricultural Research Foundation.

The cross-hatched area in Figure 1 depicts graphically the net economic gains resulting from shifts in the product supply curve as yield increases or cost reductions occur due to adoption of new technologies. The following equations were used to evaluate those gains:

(1) Total Net Economic Gains = $kP_oQ_o\ (1 + 0.5Zn)$

(2) Net Economic Gains to Consumers = $ZP_oQ_o\ (1 + 0.5Zn)$

(3) Net Economic Gains to Producers = (1) - (2)

Where: $k = (C_o - C_1)/P_o$
$Z = k\ e/(e + n)$
P_o = Original commodity price
Q_o = Original commodity quantity
e = Price elasticity of supply
n = Price elasticity of demand (absolute value)
$C_o - C_1$ = Change in cost due to research

When benefits are measured as a quantity change rather than a cost change, the variable K is calculated as $(Q_2 - Q_o)/Q_o$ which equals the percentage change in yield due to research. K is then converted to k for use in the equations by making use of the relationship $k + K/e$.

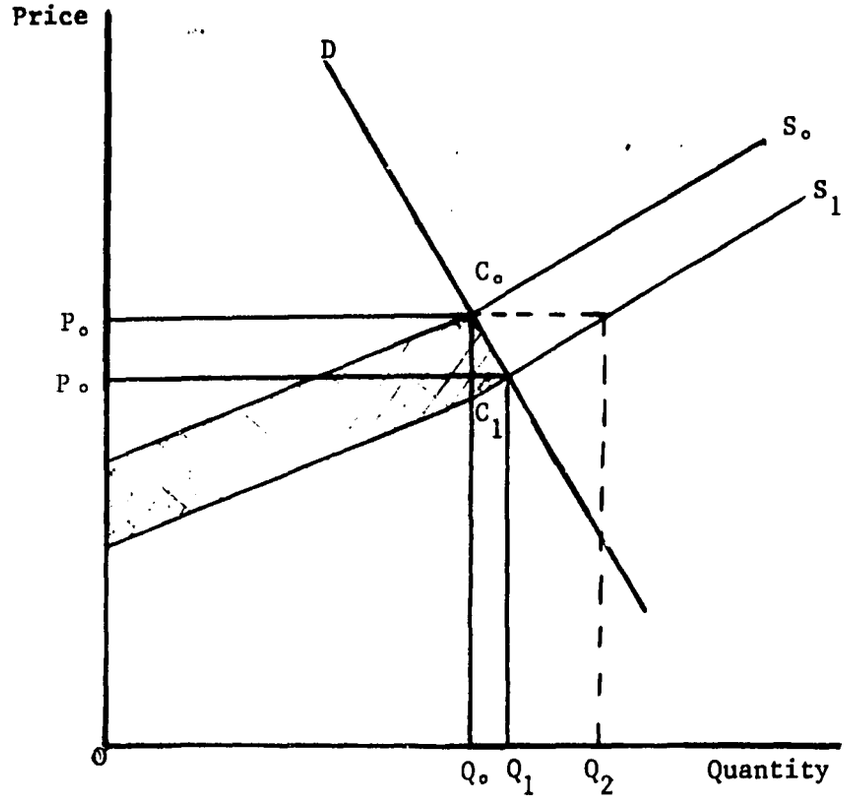
The initial price and quantity for citrus are assumed to be $75 per ton and 66,000 metric tons. The latter assumes 60% of the area bearing fruit in any one year will yield 22 tons per hectare. The initial price and yield of bananas is $9 per quintal and 31,000,000 quintals. Initial corn price and quantity produced are $7 per quintal and 9,000,000 quintals. The aggregate price and quantity produced for basic grains is $250 per ton and 650,000 tons, respectively.

The price elasticities of demand are assumed to be -0.3 for corn, -0.4 for basic grains, -2.0 for bananas and -5.0 for citrus. Supply elasticities of 1.0 are assumed for each commodity. The equation for total economic gain is relatively insensitive to differences in the demand and supply elasticities. Corn and basic grains have inelastic price elasticities of demand because they are basic staples. Bananas and citrus are export crops for which Honduran production has less impact on price.

Total net economic gains, gains to consumers, and gain to producers calculated using equations (1) - (3) and the assumptions listed above are shown in Tables 4-7. The present value of those gains is $24.0 million for bananas, $8.3 million for citrus, $8.4 million for corn, and $10.9 million for basic grains calculated with a 12% discount factor.

D-12a

FIGURE 1. BENEFITS TO AGRICULTURAL RESEARCH.



D.12. b-

Table 4. Net economic gains to citrus research (current $).

Year	Total Economic Gain	Consumer Gain	Production Gain
1	0	0	0
2	0	0	0
3	$ 130,380	$ 21,773	$ 108,607
4	502,233	83,873	418,360
5	848,307	141,667	706,640
6	1,175,581	196,322	979,259
7	1,488,754	248,622	1,240,132
8	1,791,082	299,111	1,491,971
9	2,084,888	348,176	1,736,712
10	2,371,876	396,103	1,975,773
11	2,526,976	422,005	2,104,971
12	2,663,829	444,859	2,218,970
13	2,785,476	465,174	2,320,302
14	2,894,318	483,351	2,410,967
15	2,992,275	499,710	2,492,562
16	2,894,318	483,351	2,410,967
17	2,783,476	465,174	2,320,302
18	2,663,829	444,859	2,218,970
19	2,526,976	422,005	2,104,971
20	2,371,876	396,103	1,975,773
Total Present Value of Research Gains Using a 12% Discount Rate	$ 8,349,929	$ 1,394,438	$ 6,955,491

Table 5. Net economic gains to banana breeding research (current $)

Year	Total Economic Gain	Consumer Gain	Production Gain
1	0	0	0
2	0	0	0
3	0	0	0
4	0	0	0
5	0	0	0
6	0	0	0
7	0	0	0
8	0	0	0
9	0	0	0
10	0	0	0
11	$ 5,393,757	$ 1,971,946	$ 4,021,811
12	13,985,433	4,601,207	9,384,226
13	19,979,190	6,573,154	13,406,037
14	18,980,230	6,244,496	12,735,735
15	17,981,271	5,915,838	12,065,433
16	16,982,311	5,587,180	11,395,131
17	15,983,352	5,258,523	10,724,830
18	14,984,392	4,929,865	10,054,528
19	13,985,433	4,601,207	9,384,226
20	12,986,473	4,272,550	8,713,924
Total Present Value of Research Gains using a 12% discount rate	$24,021,916	$7,903,210	$16,118,706

D. 12. d

Table 6. Net economic gains to corn research (current $)

Year	Total Economic Gain	Consumer Gain	Production Gain
1	0	0	0
2	$ 126,146	$ 97,132	$ 29,014
3	379,304	290,800	88,504
4	639,432	490,625	148,807
5	899,561	690,449	209,112
6	1,159,689	890,274	269,416
7	1,419,818	1,090,098	329,780
8	1,679,947	1,289,924	390,023
9	1,940,075	1,489,748	450,329
10	2,200,204	1,689,573	510,631
11	2,460,333	1,889,398	570,935
12	2,720,462	2,089,223	631,239
13	2,980,590	2,289,048	691,542
14	3,240,720	2,488,873	751,847
15	2,980,590	2,289,048	601,542
16	2,720,462	2,089,223	631,239
17	2,460,333	1,889,398	570,935
18	2,200,204	1,689,573	510,631
19	1,940,075	1,489,749	450,327
20	1,679,947	1,289,924	390,023
Total Present Value of Research Gains using a 12% discount rate.	$8,381,734	$6,370,141	$2,011,623

Table 7. Net economic gains to basic grains research (current $)

Year	Total Economic Gain	Consumer Gain	Production Gain
1	0	0	0
2	162,731	115,539	47,192
3	488,192	341,7[illegible]5	146,457
4	826,351	584,[illegible]66	241,785
5	1,164,510	827,398	337,112
6	1,502,668	1,070,230	432,438
7	1,840,827	1,313,061	527,766
8	2,178,986	1,555,893	623,093
9	2,517,145	1,798,725	718,420
10	2,855,303	2,041,556	813,747
11	3,193,462	2,284,388	909,074
12	3,531,621	2,527,220	1,004,401
13	3,869,779	2,770,052	1,099,727
14	4,208,938	3,012,883	1,195,054
15	3,869,779	2,770,052	1,099,727
16	3,531,621	2,527,220	1,004,401
17	3,193,462	2,284,388	909,074
18	2,855,303	2,041,556	813,747
19	2,517,145	1,798,725	718,420
20	2,178,986	1,555,893	623,093
Total Present Value of Research Gains using a 12% discount rate	$10,870,979	$ 7,827,105	$ 3,043,874

TABLE 8. Expected Costs, Benefits, Net Benefits and Internal Rate of Return (IRR): CITRUS

YEAR	COSTS	BENEFITS	NET BENEFITS	
1984	144,699	0	(144,699)	
1985	971,286	0	(971,286)	
1986	433,322	0	(433,322)	
1987	399,895	130,380	(269,515)	
1988	318,563	502,233	183,670	
1989	327,004	848,307	521,303	
1990	342,088	1,175,581	833,493	
1991	350,618	1,488,754	1,138,136	
1992	378,650	1,791,082	1,412,432	
1993	420,832	2,084,888	1,664,056	
1994	0	2,371,876	2,371,876	
1995	0	2,526,976	2,526,976	
1996	0	2,663,829	2,663,829	
1997	0	2,785,476	2,785,476	
1998	0	2,894,318	2,894,318	ESTIMATE
1999	0	2,992,275	2,992,275	0.35
2000	0	2,894,318	2,894,318	========
2001	0	2,783,476	2,783,476	
2002	0	2,663,829	2,663,829	
2003	0	2,526,976	2,526,976	ACTUAL
2004	0	2,371,876	2,371,876	IRR
				0.3443383
TOTAL	4,086,957	37,496,450	33,409,493	=========

TABLE 9. Expected Costs, Benefits, Net Benefits and Internal Rate of Return (IRR): BANANAS

YEAR	COSTS	BENEFITS	NET BENEFITS	
1984	452,184	0	(452,184)	
1985	3,035,269	0	(3,035,269)	
1986	1,661,068	0	(1,661,068)	
1987	1,625,378	0	(1,625,378)	
1988	1,557,849	0	(1,557,849)	
1989	1,563,372	0	(1,563,372)	
1990	1,617,308	0	(1,617,308)	
1991	1,633,949	0	(1,633,949)	
1992	1,730,246	0	(1,730,246)	
1993	1,899,005	0	(1,899,005)	
1994	0	0	0	
1995	0	5,393,757	5,393,757	
1996	0	13,985,433	13,985,433	
1997	0	19,979,190	19,979,190	
1998	0	18,980,230	18,980,230	ESTIMATE
1999	0	17,981,271	17,981,271	0.22
2000	0	16,982,311	16,982,311	========
2001	0	15,983,352	15,983,352	
2002	0	14,984,392	14,984,392	
2003	0	13,985,433	13,985,433	ACTUAL
2004	0	12,986,473	12,986,473	IRR
				0.2187721
TOTAL	16,775,628	151,241,842	134,466,214	=========

TABLE 10. Expected Costs, Benefits, Net Benefits and Internal Rate of Return (IRR): OTHER GRAINS

YEAR	COSTS	BENEFITS	NET BENEFITS	
1984	49,877	0	(47,877)	
1985	334,799	0	(334,799)	
1986	225,980	162,731	(63,249)	
1987	221,447	488,192	266,745	
1988	213,670	826,351	612,681	
1989	213,104	1,164,510	951,406	
1990	220,298	1,504,668	1,284,370	
1991	221,264	1,840,827	1,619,563	
1992	232,624	2,178,986	1,946,362	
1993	254,253	2,517,145	2,262,892	
1994	0	2,855,303	2,855,303	
1995	0	3,193,462	3,193,462	
1996	0	3,531,621	3,531,621	
1997	0	3,869,779	3,869,779	
1998	0	4,208,938	4,208,938	ESTIMATE
1999	0	3,869,779	3,869,779	0.82
2000	0	3,531,621	3,531,621	========
2001	0	3,193,462	3,193,462	
2002	0	2,855,303	2,855,303	
2003	0	2,517,145	2,517,145	ACTUAL
2004	0	2,178,986	2,178,986	IRR
				0.8182838
TOTAL	2,187,315	46,488,809	44,301,494	=========

TABLE 11. Expected Costs, Benefits, Net Benefits and Internal Rate of Return (IRR): CORN

YEAR	COSTS	BENEFITS	NET BENEFITS	
1984	85,504	0	(85,504)	
1985	573,942	0	(573,942)	
1986	389,058	126,146	(262,912)	
1987	382,695	379,304	(3,391)	
1988	367,124	639,432	272,308	
1989	371,094	899,561	528,467	
1990	386,864	1,159,689	772,825	
1991	393,169	1,419,818	1,026,649	
1992	419,402	1,679,947	1,260,545	
1993	462,915	1,940,075	1,477,160	
1994	0	2,200,204	2,200,204	
1995	0	2,460,333	2,460,333	
1996	0	2,720,462	2,720,462	
1997	0	2,980,590	2,980,590	
1998	0	3,240,720	3,240,720	ESTIMATE
1999	0	2,980,590	2,980,590	0.45
2000	0	2,720,462	2,720,462	========
2001	0	2,460,333	2,460,333	
2002	0	2,200,204	2,200,204	
2003	0	1,940,075	1,940,075	ACTUAL
2004	0	1,679,947	1,679,947	IRR
				0.4526071
TOTAL	3,831,767	35,827,892	31,994,125	=========

TABLE 12. NET PRESENT VALUE OF RESEARCH INVESTMENT (at 12.0% p.a.)

YEAR	CITRUS COSTS	CITRUS BENEFITS	CITRUS NET	BANANAS COSTS	BANANAS BENEFITS	BANANAS NET
1984	144,699	0	(144,699)	452,184	0	(452,184)
1985	971,286	0	(971,286)	3,035,269	0	(3,035,269)
1986	433,322	0	(433,322)	1,661,068	0	(1,661,068)
1987	399,895	130,380	(269,515)	1,625,378	0	(1,625,378)
1988	318,563	502,233	183,670	1,557,849	0	(1,557,849)
1989	327,004	848,307	521,303	1,563,372	0	(1,563,372)
1990	342,088	1,175,581	833,493	1,617,308	0	(1,617,308)
1991	350,618	1,488,754	1,138,136	1,633,949	0	(1,633,949)
1992	378,650	1,791,082	1,412,432	1,730,246	0	(1,730,246)
1993	420,832	2,084,888	1,664,056	1,899,005	0	(1,899,005)
1994	0	2,371,876	2,371,876	0	0	0
1995	0	2,526,976	2,526,976	0	5,393,757	5,393,757
1996	0	2,663,829	2,663,829	0	13,985,433	13,985,433
1997	0	2,785,476	2,785,476	0	19,979,190	19,979,190
1998	0	2,894,318	2,894,318	0	18,980,230	18,980,230
1999	0	2,992,275	2,992,275	0	17,981,271	17,981,271
2000	0	2,894,318	2,894,318	0	16,982,311	16,982,311
2001	0	2,783,476	2,783,476	0	15,983,352	15,983,352
2002	0	2,663,829	2,663,829	0	14,984,392	14,984,392
2003	0	2,526,976	2,526,976	0	13,985,433	13,985,433
2004	0	2,371,876	2,371,876	0	12,986,473	12,986,473
NPV	2,380,894	8,349,929	5,969,035	9,341,610	24,021,916	14,680,307

YEAR	BASIC GRAINS COSTS	BASIC GRAINS BENEFITS	BASIC GRAINS NET	CORN COSTS	CORN BENEFITS	CORN NET
1984	49,877	0	(49,877)	85,504	0	(85,504)
1985	334,799	0	(334,799)	573,942	0	(573,942)
1986	225,990	162,731	(63,249)	389,058	126,146	(262,912)
1987	221,447	488,192	266,745	382,695	379,304	(3,391)
1988	213,670	826,351	612,681	367,124	639,432	272,308
1989	213,104	1,164,510	951,406	371,094	899,561	528,467
1990	220,298	1,504,668	1,284,370	386,864	1,159,689	772,825
1991	221,264	1,840,827	1,619,563	393,169	1,419,818	1,026,649
1992	232,624	2,178,986	1,946,362	419,402	1,679,947	1,260,545
1993	254,253	2,517,145	2,262,892	462,915	1,940,075	1,477,160
1994	0	2,855,303	2,855,303	0	2,200,204	2,200,204
1995	0	3,193,462	3,193,462	0	2,460,333	2,460,333
1996	0	3,531,621	3,531,621	0	2,720,462	2,720,462
1997	0	3,869,779	3,869,779	0	2,980,590	2,980,590
1998	0	4,208,938	4,208,938	0	3,240,720	3,240,720
1999	0	3,869,779	3,869,779	0	2,980,590	2,980,590
2000	0	3,531,621	3,531,621	0	2,720,462	2,720,462
2001	0	3,193,462	3,193,462	0	2,460,333	2,460,333
2002	0	2,855,303	2,855,303	0	2,200,204	2,200,204
2003	0	2,517,145	2,517,145	0	1,940,075	1,940,075
2004	0	2,178,986	2,178,986	0	1,679,947	1,679,947
NPV	1,196,987	10,870,979	9,673,992	2,084,422	8,381,764	6,297,342

D-16

TABLE A1: DIRECT RESEARCH COSTS ($000)

YEAR	NON-TRADITIONAL CITRUS	CACAO	VEG.	OTHER	BASIC GRAINS CORN	BEANS	TRADITIONAL COFFEE	P & F	BANANA	TOTAL DIRECT RESRCH COSTS	TOTAL LESS BANANAS	OTHER DESG. RESEARCH COSTS FARM PERS	CONSTR	TOTAL
1984	0	0	0	0	0	0	0	0	0	0	0	0		0
1985	264	0	244	0	156	91	0	0	825	1580	755	47	120	167
1986	186	282	255	0	167	97	38	0	713	1738	1025	53		53
1987	186	195	268	0	178	103	41	0	756	1727	971	59		59
1988	164	177	216	0	189	110	45	0	802	1703	901	66		66
1989	178	189	230	377	202	116	48	154	851	2345	1494	74		74
1990	191	237	245	462	216	123	51	161	903	2589	1686	83	120	203
1991	206	219	261	380	231	130	55	169	960	2611	1651	93		93
1992	223	236	280	400	247	137	60	176	1019	2778	1759	104		104
1993	240	253	299	353	264	145	64	183	1083	2884	1801	116		116
TOTAL	1838	1788	2298	1972	1850	1052	402	843	7912	19955	12043	695	240	935

TABLE A2: OTHER FOUNDATION COST ($000)

YEAR	ADMIN	CAPITAL	EXP SUB	OTH RESRC	COMM	MULT R/S	EVAL	CONT	INDIRECT RESEARCH COSTS	MEMO ITEMS: DIRECT RESEARCH LESS BAN	GRAND TOTAL	TOTAL DIRECT RESEARCH COSTS	TOTAL LESS BANANAS
1984	366	500	0	0	0	0	0	0	866	0	866	0	0
1985	1084	1869	0	167	676	359	0	78	4233	755	4988	1747	922
1986	1174	0	0	53	664	317	25	78	2311	1025	3336	1791	1078
1987	937	75	144	59	453	243	0	75	1986	971	2957	1786	1030
1988	855	0	0	66	277	257	75	75	1605	901	2506	1769	967
1989	893	213	144	74	292	272	0	75	1963	1494	3457	2419	1568
1990	955	296	0	203	307	287	0	0	2048	1686	3734	2792	1889
1991	1024	90	0	93	322	304	0	0	1833	1651	3484	2704	1744
1992	1100	75	0	104	339	321	0	0	1939	1759	3698	2882	1863
1993	1180	0	80	116	358	339	100	0	2173	1801	3974	3000	1917
TOTAL	9568	3118	368	935	3688	2699	200	381	20957	12043	33000	20890	12978

TABLE A3: RESEARCH COSTS AS A PERCENT OF TOTAL DIRECT RESEARCH COSTS

YEAR	NON-TRADITIONAL CITRUS	CACAO	VEG.	OTHER	BASIC GRAINS CORN	BEANS	TRADITIONAL COFFEE	P & F	BANANA	TOTAL	TOTAL LESS BANANAS
1984	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
1985	16.71%	0.00%	15.44%	0.00%	9.87%	5.76%	0.00%	0.00%	52.22%	100.00%	47.78%
1986	10.70%	16.23%	14.67%	0.00%	9.61%	5.58%	2.19%	0.00%	41.02%	100.00%	58.98%
1987	10.77%	11.29%	15.52%	0.00%	10.31%	5.96%	2.37%	0.00%	43.78%	100.00%	56.22%
1988	9.63%	10.39%	12.68%	0.00%	11.10%	6.46%	2.64%	0.00%	47.09%	100.00%	52.91%
1989	7.59%	8.06%	9.81%	16.08%	8.61%	4.95%	2.05%	6.57%	36.29%	100.00%	63.71%
1990	7.38%	9.15%	9.46%	17.84%	8.34%	4.75%	1.97%	6.22%	34.88%	100.00%	65.12%
1991	7.89%	8.39%	10.00%	14.55%	8.85%	4.98%	2.11%	6.47%	36.77%	100.00%	63.23%
1992	8.03%	8.50%	10.08%	14.40%	8.89%	4.93%	2.16%	6.34%	36.68%	100.00%	63.32%
1993	8.32%	8.77%	10.37%	12.24%	9.15%	5.03%	2.22%	6.35%	37.55%	100.00%	62.45%
TOTAL	9.21%	8.96%	11.52%	9.88%	9.27%	5.27%	2.01%	[illegible]	39.65%	[illegible]	60.35%

TABLE A4: OTHER FOUNDATION COSTS DISTRIBUTED AMONG RESEARCH CATEGORIES ($000)

(According to the percentages presented in Table A3, above.)

	NON-TRADITIONAL				BASIC GRAINS		TRADITIONAL			
YEAR	CITRUS	CACAO	VEG.	OTHER	CORN	BEANS	COFFEE	P & F	BANANA	TOTAL
1984	144.7	0.0	133.7	0.0	85.5	49.9	0.0	0.0	452.2	866.0
1985	707.3	0.0	653.7	0.0	417.9	243.8	0.0	0.0	2210.3	4233.0
1986	247.3	375.0	339.1	0.0	222.1	129.0	50.5	0.0	948.1	2311.0
1987	213.9	224.2	308.2	0.0	204.7	118.4	47.1	0.0	869.4	1986.0
1988	154.6	166.8	203.6	0.0	178.1	103.7	42.4	0.0	755.8	1605.0
1989	149.0	158.2	192.5	315.6	169.1	97.1	40.2	128.9	712.4	1963.0
1990	151.1	187.5	193.8	365.5	170.9	97.3	40.3	127.4	714.3	2048.0
1991	144.6	153.7	183.2	266.8	162.2	91.3	38.6	118.6	673.9	1833.0
1992	155.7	164.7	195.4	279.2	172.4	95.6	41.9	122.8	711.2	1939.0
1993	180.8	190.6	225.3	266.0	198.9	109.3	48.2	137.9	816.0	2173.0
TOTAL	2249.0	1620.8	2628.6	1493.0	1981.8	1135.3	349.3	635.6	8863.6	20957.0

TABLE A5: SUMMARY OF DIRECT AND INDIRECT RESEARCH COSTS ($000)

	CITRUS			BANANAS			CORN			OTHER BASIC GRAINS		
YEAR	DIRECT	INDIRECT	TOTAL	DIRECT	INDIRECT	TOTAL	DIRECT	INDIRECT	TOTAL	DIRECT	INDIRECT	TOTAL
1984	0.0	144.7	144.7	0.0	452.2	452.2	0.0	85.5	85.5	0.0	49.9	49.9
1985	264.0	707.3	971.3	825.0	2210.3	3035.3	156.0	417.9	573.9	91.0	243.8	334.8
1986	186.0	247.3	433.3	713.0	948.1	1661.1	167.0	222.1	389.1	97.0	129.0	226.0
1987	186.0	213.9	399.9	756.0	869.4	1625.4	178.0	204.7	382.7	103.0	118.4	221.4
1988	164.0	154.6	318.6	802.0	755.8	1557.8	189.0	178.1	367.1	110.0	103.7	213.7
1989	178.0	149.0	327.0	851.0	712.4	1563.4	202.0	169.1	371.1	116.0	97.1	213.1
1990	191.0	151.1	342.1	903.0	714.3	1617.3	216.0	170.9	386.9	123.0	97.3	220.3
1991	206.0	144.6	350.6	960.0	673.9	1633.9	231.0	162.2	393.2	130.0	91.3	221.3
1992	223.0	155.7	378.7	1019.0	711.2	1730.2	247.0	172.4	419.4	137.0	95.6	232.6
1993	240.0	180.8	420.8	1083.0	816.0	1899.0	264.0	198.9	462.9	145.0	109.3	254.3
TOTAL	1838.0	2249.0	4087.0	7912.0	8863.6	16775.6	1850.0	1981.8	3831.8	1052.0	1135.3	2187.3

The total direct and indirect research costs are transferred from this table to Tables 8, 9, 10, and 11, respectively, for each of the above commodities.

Internal rates of return to the selected areas of Foundation research expenditure are also calculated. In order to better reflect the total research costs for each of the examples selected, both direct costs and distributed indirect or overhead costs for each program are calculated in Tables A1-A5. These total research costs are then combined with the research benefits from Tables 4-7 to calculate internal rates of return for the selected commodity areas in Tables 8-11. Table A1 presents the Foundations direct research expenditures for each proposed research area as listed in the project cost projections (in Section V, Financial Analysis). Other foundation costs are presented in Table A2 and are summed under the heading "Indirect Research Costs". Table A3 lists the direct research costs for each of the nine proposed research areas as a percent of the "Total Direct Research Costs" in Table A1. The percent figures from Table A3 are then used to distribute the Indirect Research Costs among the various research areas as calculated and presented in Table A4. Table A5 then combines the Direct and Indirect Research Costs for each of the four selected areas. The total costs from Table A5 are used in calculating the IRRs for the Foundation's research in citrus, bananas, other basic grains (beans), and corn (and sorghum), as presented in Tables 8-11, respectively. The resulting returns are 21.9% for bananas, 34.4% for citrus, 45.3% for corn, and 81.8% for basic grains. Differences are due primarily to differences in adoption rates, research costs, timing of benefits, and value of production. For instance, the benefits used to calculate the IRR for bananas only reflects the returns in Honduras. When returns in other countries are included, this figure would be higher. These rates of return indicate a tremendous opportunity available in Honduras for economic gains due to agricultural research.

The distribution of economic gains to consumers and producers provided in Tables 4-7 indicate that 17% of gains in citrus accrue to consumers and 83% to producers. For bananas, 33% accrue to consumers and 67% to producers. For corn, 76% are received by consumers and 24% by producers and for basic grains as a group, 72% accrue to consumers and 28% to producers. However, to the extent that Honduras becomes an importer of corn and other basic grains, price responsiveness to increased production will be reduced and a larger portion of the benefits will shift to producers.

A number of other distributional factors also should be considered. (1) Honduran farmers consume approximately 40% of their corn and bean production on the farm, 60% of their sorghum production, and 15% of their rice. Therefore, producers of corn and other basic grains receive sizable benefits as consumers. (2) For export crops, U.S. consumers benefit because they obtain increased supplies of bananas and citrus at lower prices. (3) The urban poor, which spend a high proportion of their income on basic food grains, receive a large part of the benefits of corn and basic grains research. Smaller farmers at high elevations are likely to adopt the research results more slowly than larger farmers in the lowlands and will not benefit from the research unless major improvements are made in the extension

service. (4) To the extent that bananas are produced by foreign owned companies, only part of the producer benefits will remain in Honduras. If this were not true, however, those companies would not have an incentive to support the Foundation. Substantial export taxes will be generated by the production increases. Currently, $0.50 per 40 pound box is paid to the Honduran government which represents approximately 7% of the total export value. (5) There may be benefits to agricultural producers as well as the country as a whole due to reduced variability in agricultural income. For example, sorghum grows on extremely dry or wet/dry soils and improved sorghum varieties can increase income to farmers particularly during the dry season when corn production is very risky. Furthermore, the diversification export crops such as citrus will reduce the extreme dependence on bananas for export earnings, thereby reducing the fluctuations in national income which occur as banana production and prices experience wide swings.

Another direct and very important economic benefit of Foundation research will result from its role in maintaining current levels of production. Even if no yield increases are realized, but current production is stopped from declining as insects and diseases evolve and are introduced from other countries, the Foundation will have paid for itself.

In addition to direct economic impacts due to yield increases, research will affect employment, product quality, nutrition, industrial development, foreign exchange, and linkages to the international agricultural research centers. The Tela Railroad Company currently employes 11,000 workers. A new banana variety will not displace workers, but may well increase harvest labor. The projected increase in citrus production also should increase rural employment. Research on basic grains is not likely to increase employment directly because some resources will be forced out of the sector due to the price inelasticity of demand regardless of whether the new technologies are inherently labor displacing or labor utilizing. Most of the impacts on employment will be felt at the secondary level through two effects. First, the increased production and income will have a multiplier effect on other industries in both the rural and urban areas as the demand for non-agricultural goods increases. Secondly, to the extent that increased corn production keeps food prices low, this facilitates capital formation in the industrial sector. The latter increases the marginal productivity of labor which in turn increases the demand for labor.

Product quality impacts can result from Foundation research as well. If high quality fruit are produced, the average price may increase. Assessment of general nutritional impacts due to research requires an analysis of the changes in level and mix of products consumed following introduction of the new technology. While a detailed quantitative analysis is not possible for this report, the basic grain research program should improve nutritional level of poor urban consumers. For example, to the extent that they can buy corn and meet their basic energy requirements at lower prices, more of their income is left to purchase foods which are higher in vitamins and protein. Major

impacts may results from increased income from the employment increases described above. Increases in bean production will help reduce the price of that basic protein source. Increased sorghum production will help reduce the variability in food production, thereby improving nutrition, paticularly in the rural sector where much of the sorghum is consumed. Research on export crops will improve nutrition in the rural sector because of increased income resulting from higher employment. Increased exports and reduction in their variability through diversification, will generate a higher and more constant level of foreign exchange. This will benefit the economy as a whole and help to maintain income levels. All these benefits should be added to the direct economic gains identified above.

Factors affecting the adoption of agricultural research were described in the social analysis section of this paper and were mentioned briefly above. Despite the extremely high rates of return described earlier, the projected benefits of Foundation research are greatly reduced from what they potentially could be due to a series of factors affecting the demand for new technologies in Honduras. It is assumed that only 20% of Honduran corn producers adopt research results because (1) the extension service needs improvement, (2) credit is very difficult to obtain for most producers, and (3) the local marketing structure is inadequately developed. Factors such as pricing policies, education, overvalued exchange rates and others may influence technology adoption, but the first three are probably the most important. If adoption rates for basic grains could be increased from 20% to 50%, returns would be more than doubled.

The sensitivity of the quantitative results presented in this section to changes in assumptions with respect to prices, quantities, elasticities, and research costs can be tested using equations (1) - (3). In general, proportional changes in K result in proportional changes in benefits. Changes in elasticities will have little impact on total benefits, but affect the distribution between producers and consumers. If the demand elasticity is absolutely smaller than the supply elasticity, consumers will tend to receive a larger share of the benefits. The quantitative estimates in this annex are crude at best but illustrate the types of benefits likely to result from Foundation research.

IV. CONCLUSIONS

Honduran agricultural production has stagnated for the past 15 years while public research expenditures as a proportion of agricultural gross domestic product has been among the lowest in the world. The proposed Honduran Agricultural Research Foundation has the opportunity to make a substantial and widespread impact on the economy. An assessment of the benefits of Foundation research requires establishment of criteria for evaluating research on different commodities and projects. Examples include income or employment gains to producers and consumers, gains to different income groups, maximum return to scarcest resources, nutritional impacts, generation of foreign

exchange, maximum impact on industrial development, and changes in product quality. Several of these were examined for research on basic grains, traditional export crops, and non-traditional export crops. Research on each of these commodities is projected to result in high rates of return to research investment. Distributional impacts will differ, however, with improvements in export crops tending to benefit producers more than consumers. Rural employment tends to be increased more by research on export crops while urban employment may be aided more by basic grains research. Industrial development is assisted by reduced food prices for basic grains as well as by export generated foreign exchange which improves the economy as a whole. Nutritional impacts tend to closely follow changes in income and employment.

Adoption of research results in Honduras is greatly hindered by lack of credit, extension, and local marketing infrastructure. Benefits, particularly for basic grains, could be increased substantially with improvements in these factors.

The Honduran Agricultural Research Foundation will hire a socio-economist to (1) work with production scientists in defining on-farm constraints to technology adoption and (2) provide a detailed quantitative assessment of impacts of research on alternative commodities and research projects as research plans are developed each year. Socio-economic analysis is crucial for maximizing rates of adoption of new technologies and for insuring that the technologies developed contribute to the goals and objectives of Honduras. Baseline data should be collected in the first year to form a basis for subsequent evaluations of Foundation research.

E. Institutional Development and Demand for Foundation Services

TABLE OF CONTENTS

I. The Development Function of the Foundation

II. Scope and Approach of the Demand Analysis

III. Summary Analysis of Potential Demand and Support

- A. Honduran Agricultural Federations, Associations, Cooperatives
- B. Honduran Corporate and Financial Sectors
- C. Honduran and U.S. - Based PVO's
- D. The Government of Honduras
- E. International and Regional Agricultural Research Centers
- F. U.S. - Based Corporate and Financial Sectors
- G. U.S. Private Sector
- H. U.S. and International Development Agencies; other Donor Countries

IV. Next Steps in the Foundation's Development Process

V. Related Considerations

- A. Parallel U.S. Foundation
- B. Financial Schemes for Soliciting Support
- C. Patented Research
- D. Representation of Key Actors
- E. Training

Exhibits

232

I. The Development Function of the Foundation

A. Introduction

If the Foundation is to attain its objectives and sustain its research work over the long-term, it must secure outside funding. It is recommended that from its inception the Foundation begin to institutionalize a serious organizational development (fund-raising) effort.

Development is a disciplined, organized process, especially in the United States where more than 300,000 not-for-profit institutions, organizations, and agencies compete for funds. It is this professional experience which provides guidance in designing the development function for the Foundation. First and foremost is the attitude with which the Foundation takes on the development process. That is to say, it is not a charitable case. "Charity" is a gift made with no expectation of receiving any in return. Instead, F.H.I.A. has quality, scientifically developed products to offer and it can choose and approach potential sponsors, donors, and cooperators with an opportunity to make an investment, rather than a charitable gift.

B. Organization and Management

The Director General, with the active participation of the Assembly and Board of Directors, must assume the role of principal fund-raiser. For the first two years he must "show the flag" of the F.H.I.A. to a selected audience of potential donors. Those unfamiliar with contemporary development see information collection and proposal writing skills as of highest priority. Although important practice has shown that human relationship skills far outweigh any others. Those responsible for granting or disbursing funds focus on the individuals representing institutions. People give to people, not entities. The Director General and his/her designees must personally establish FHIA's importance in the minds of potential sponsors, public and private. This will require patience, solid and imaginative communications packaging and professional back-stopping on the operational level.

Operational responsibility for the development task is strategically placed with the Communications and Development Directorate. Its program responsibilities related to raising funds are the following:

- To develop continuing and effective intelligence on all potential donors and donor groups;

- To develop a plan for coordinated information exchange with research and training staff to remain abreast of "investment opportunities" for potential donors;

- To regularly confer with the Executive Director and other senior staff on potential collaborative opportunities with national and international institutions where such collaboration will enhance the chances for investments;

- To plan and organize regular special events to which potential donors may be invited;

- To plan and organize an efficient feedback system to staff and donors of the results of their efforts and/or investments;

- To design and organize an annual work plan to establish the Foundation as a significant national, regional and international center of research excellence;

- To build from inception a sponsorship base of public and private donors for capital and endowment funds;

- To represent the Foundation before individuals, institutions and organizations important to its growth and expanded service as requested by the Executive Director and Board of Directors;

- To work closely with the external advisory committee in interpreting and guiding Foundation response(s) to new demands and opportunities for service to the Honduran regional and international agricultural research communities;

- Design and prepare materials supportive of the development function, including manuals for volunteers such as the Board of Directors.

For the initial years it is not economically feasible for the new Foundation to have a staff of experts who are knowledgeable and experienced in development fund raising. A development consultant (or firm) should be contracted to work closely with the Executive Director in establishing the development process.

The consultant would provide technical assistance in three major areas: professional counselling and traininmg to the Board, Executive Director, and Communications/Development Director; planning; and record keeping systems. The first of these areas is of particular importance since it is not the job of the consultant to publically represent the Foundation, but rather, to provide Board members and Chief officers the proper direction and guidance so that they themselves learn to raise funds. As the growth in development activities warrants, additional operational staff will be hired and the consultant will give training and guidance to those individuals.

Approximately six man-months of technical assistance, extended over a two-year period, is recommended. This estimation is based on the calculation that the Executive Director and Communication/Development Director should be allocating about 1/4 of their time in development. The consultant (or firm) would not be required to be based in Honduras. In fact, there are distinct advantages to being based in the United States, expanding the access to potential U.S. sponsors and cooperators.

C. Stages in the Development Process

The development process involves four major stages:

- building client/sponsor awareness of the Foundation's goals and objectives, programs and services;

- developing strong interest in the work of the Foundation;
- initiating negotiations on areas of mutual interest; and
- acquiring a commitment of resources from the client/sponsor.

The development activity undertaken in 1985 with research, interviews, proposals, site visits and consultations combined will most likely not result in funding. But relationships will have been created, FHIA worthiness will be broadly known, suggestions of future interest will have been expressed and the all-important competitive position will be established. The fruits of this FHIA investment will be forthcoming in future years if encouraged by a range of communication activities tying the potential donor to the institution. Development is a continuous process and it is important that the Foundation expect a sponsors movement from the awareness stage to a commitment of resources to take three to five years. A further explanation of anticipated timing, by target group, is highlighted in Section III below.

D. Essential Factors

The development function is intended to foster consistent two-way exchange between the Foundation and its supportive public. If the process is to be successful, several factors are deemed essential and should be considered in the overall planning for the institution. They are:

1. The Foundation must be embraced by a community of Honduran and international organizations, associations and individuals as both users and sponsors;

2. The key factor in establishing cooperative projects will be the clarity of the Foundation's mandate and relation to the Honduran bureaucracy;

3. In the short run, the Foundation must be perceived as truly autonomous and independent and, in the long run, it must live up to those perceptions;

4. The users must be sufficient in number and diversity, and have sufficient available resources to sustain their research & training demands.

5. Credible, influential endorsers and sponsors must ratify written foundation policies and operating goals before the venture is launched.

6. While autonomy is important, the directors and staff must be aware of existing government policies and programs as well as support services. The farming population will adopt improved technology and practices if they are perceived to be profitable.

7. The agricultural research, training and communications services must be planned within broader, rural development activities to be of lasting benefit.

8. One or more areas of Foundation research must show benefits to Honduras within a short time after its initiation if the Foundation is to be economically and politically supportable by government agencies and institutions.

II. Scope and Approach of the Demand Analysis

The objective of the analysis was to identify, interview and interpret the results of studies of the several potential clients interested and capable of using and supporting the Foundation's research and analytical services.

After a period of discussions with knowledgeable individuals eight target groups were chosen:

1. Honduran Agricultural Federations, Associations, Cooperatives
2. Honduran Corporate and Financial Sectors
3. Honduran and U.S. based Private Voluntary Organizations
4. The Government of Honduras, several of its agencies focusing on Natural Resources, INA and Education
5. International Agricultural Research Centers & Regional Ag-Centers
6. U.S. based Corporate and Financial Sectors (including trading companies, brokers)
7. U.S. Private Sector - foundations and private citizens
8. U.S. & International Development Agencies (UN/FAO, USAID, IBRD, IDB, EEC).

Thirty-one persons/organizations, representing a cross-section of most of these target groups were interviewed during a 5-week period in Honduras. A list of those visited is attached as Exhibit A. Interview reports are maintained in the USAID project files; a summary analysis of those conversations is covered in section III below.

It is important to view this analysis as an initial step in an on-going development process. Demand analysis interviews were used to (i) introduce the Foundation to potential clients/supporters, and (ii) assess their potential level of interest in using/supporting the services of the Foundation. Verbal assurances of interest and cooperation (interest beyond awareness) have limited credibility without specifics of what, when, how and how much? Although not stated, the foundation is logically competitive with many of its potential cooperators.

The interview brief and the list of questions posed are illustrated as Exhibit B.

III. Summary Analysis of Potential Demand and Support

A. Honduran Agricultural Federations, Associations, Cooperatives

One of the strongest potential users under this category is the Federation of Agricultural Producers and Exporters of Honduras (FEPROEXAH). Older producer associatons came together on the basis of mutual need and interest and started the Federation in January 1984. It has initiated contacts with potential markets in the U.S., Japan and Europe and is beginning to establish working relationships with U.S. based agricultural trading companies and brokers. It will also be one of the two major implementing organizations for the new AID Export Development and Services Project, scheduled for authorization in August 1984.

The present Federation membership is made up of 12 producer associations in the following product areas: coffee, honey, swine, sugar cane, citrus, livestock, poultry, horticulture, plantain, tobacco, cacao, rabbits, and vegetables. Combined, these associations have memberships including cooperatives and independent growers totalling approximately 24,000 producers in Honduras. Based on conversations with Federation leaders, suggested Foundation research priorities are in the areas of citrus, cacao, and vegetables (including cucmber, okra, cauliflower, and snap beans).

Additionally, there is a great deal of interest among federation members in the analytical, diagnostic and testing services of the Foundation. Soil fertility analyses, diseases, insecticide, herbicide and fungicide effectiveness corroborated by good lab and field test findings were stressed as areas of need.

Whereas research and lab-testing needs are high, the federations, associations and cooperatives will have modest abilities to support the Foundation for the first five years. They can be expected to contract for both pre and post-harvest research/demonstrations, but even through member assessments or check-offs the Foundation funding development will be slow and limited.

In reviewing the Foundation funding situation from this source, two options are worth exploring. The first would be for the cooperating group to establish surcharges or add-ons for those products benefitting from the Foundation's research projects. The surcharge must be agreed upon at least one full year in advance of Foundation commitment to undertake the research and it must be collected and retained by the cooperator with an agreed-upon retainer or disbursement schedule to the Foundation for services rendered.

The second option concerns those U.S. based corporations which have financial interests in increased and improved yields in those export commodities produced by the associations and cooperatives. (see section F below).

B. Honduran Corporate and Financial Sectors

The Foundation, although only recently organized and with no fund-raising personnel or budget, has contacted three prominent Honduran representatives from the corporate and financial sectors. Two of those contacted have committed their organizations to financial support for the Foundation, and letters to that effect are shown in Annex III. J. The third concern approached has agreed to present the Foundation concept and need for financing to its Board of Directors at its next meeting.

It is anticipated that once the Foundation begins to operate a research program and it's fund-raising capacity has been strenghtened, others from the Honduran corporate and financial sectors will participate.

C. Honduran and U.S. - based Private Voluntary Organizations

Interest was very high among the PVO's visited; all saw the benefits of cooperation with the Foundation to be obvious and practical.

In comparison to the agricultural producer associations it appears that the PVO community can be developed as both cooperators and sponsors relatively quickly with significant combined resources available. There were more than 30 (20-U.S.) PVOs working on agricultural product development in Honduras in 1984. Their combined annual budgets were more than $60,000,000 (see Exhibit C). They can employ the full range of proposed Foundation services and can develop annual plans of work with the F.H.I.A. staff, including use of lands of strategic importance for field trials and demonstrations. They have their own agronomists and extension workers, in many cases, who can be enlisted as cooperators, when desirable. For appealing, visible, timely projects, they can undertake fund-raising within the United States, raising public awareness of Foundation services and facilitating fund-raising activities for this new institution.

The PVOs are aware of the work of the Pan American Agricultural School at El Zamorano and its applicability to the needs of the farm families and villages with which they are most concerned. This suggests there is merit in working closely with El Zamorano on cooperative projects with collaborative fund raising proposals, extending Foundation research through the faculty, students and graduates of El Zamorano.

The PVO's seemed most interested in options to commercial fertilizers and herbicides since they felt small farm families could not afford them They expressed hope that the Foundation would devote resources to integrated pest management, soil amendments, and organic farming practices as well as research on specific crops. Of course, these are some of the activities that the Foundation will undertake with strong support from collaborative projects sponsored by S&T/Agriculture (IPM; IFDC; Biotechnology).

D. The Government of Honduras

GOH involvement in the governing structure of the Foundation and interest in the basic grains program is amply described in the body of the paper. Other ways for it to lend support to the work of the Foundation are described below.

At present the GOH charges a $.50 tax on each box of bananas exported from Honduras. Were the Government to establish an ascending allocation of a portion of this banana tax to the Foundation for plantain and banana research beginning with $.01 in 1984-85 up to $.05 by 1989-90, it could provide $250,000 initially and $1,250,000 by the end of the fifth year.

Another possibility would be for the GOH to consider a similar modest tax transfer on all traditional export crops.

E. International and Regional Agricultural Research Centers

The international agricultural research centers would appear to be important cooperators from the first year of Foundation life. They focus on the basic food crops. Areas of cooperation are outlined in other sections of this project paper. They will require external funding, but like the PVOS can develop annual plans of work and collaborative projects with the Foundation. Their participation will give immediate credibility to the Foundation and help open funding doors which could not be done independently in the formative years.

F. U.S. - Based Corporate and Financial Sectors

Since the decision-makers for this target group are in the United States, they were not widely interviewed during the initial demand analysis. However, there were several indicators of potential demand/support from this group and follow-up should be made a priority in the early development efforts of the Foundation (see Exhibit D for a listing).

Foremost in this group are the agricultural broker/trading companies. They are generally family-owned or individually-owned, which gives them simplicity in the contract-decision process. They are product-specific with limited research capability of their own. They are increasing in number in Honduras and many are focusing on agricultural products. An example would be Griffin and Brand of McAllen, Texas, which has formed a partnership with producers in the San Pedro Area for processing citrus juices for the U.S. market. Modest improvements in quality will reflect in their balance sheets and they should see clear advantages to underwriting Foundation research (pre and post-harvest) in their product lines.

A second sub-group are U.S. financial institutions with operating interests in Honduras. An example is Chase Manhattan Bank (which owns 49% of Banco Atlantida in Honduras). Additionally, Chase Manhattan in the States has a small Development Foundation, which is supporting agricultural projects in the developing world. Based on a conversation with a Chase representative recently on a tour with women investors in Honduras, it is strongly recommended that this avenue be explored by the Foundation.

The last sub-group are U.S.-based corporations with interests in Honduran agriculture. The most notable at this time are the banana companies: United Brands, Standard, and Del Monte. Their position vis-a-vis client/support relationships with the Foundation is not clear since a variety of factors impinge on such decisions. It does seem possible that initially they will contract for soil sample analysis, weather research, and leaf sample analysis. A willingness to make longer-term commitments will depend on actions taken by the UPEB group, the clarity and focus of the Foundation's research agenda, their inidividual company research programs, and the

Foundation's proven independence from United Brands. One possible approach would be for these companies to petition the GOH to allocate a portion of the $.50 per box tax on bananas to the work of the Foundation (see section D above).

G. U.S. Private Sector

The two major groups under this category are foundations and individuals. At this time the source of about 90% of total U.S. giving to philanthropic causes are inidividual contributions. Foundations account for 7.5 to 8%, and their share is declining.

The competition for U.S. foundation monies is very high. With a few small exceptions, they do not represent a strong potential support group for the Foundation. One exception is the Chase Manhattan Development Foundation, previously mentioned. Another is the Inter-American Foundation, where it might be possible to gain modest support for special research activities needed by cooperatives and producer associations. However, such a request would have to come from the grassroots level, and could not be submitted on their behalf by the Foundation.

A large percentage of individual U.S. giving is to religious and affiliated organizations. For this reason U.S.-based PVO's are seen as an important mechanism for channeling such funds (see section C above).

H. U.S. and International Development Agencies; Other Donor Countries

This group (see Exhibit D) was not explored during the initial demand anlaysis, but does represent an important source of support, as exemplified by FAO's funding of the banana breeding project. It is recommended that the development staff do further research on their funding priorities, lending mechanisms, and target groups for assistance.

IV. Next Steps in the Development Process

A. General Strategy

During its first year of operations the Foundation, with technical assistance guidance, needs to take several key steps in order to successfully launch the development effort. These steps include planning and strategizing for

specific target groups; informational research on potential sponsors; training for the Executive Director and Board members; the initiation of contact work with 12-15 potential donors.

Of particular importance is the information research task. A majority of effort should be devoted to preparing a complete file of information on the 40 to 50 foundations, corporations, and private citizens with a demonstrated interest in the service area of the FHIA. Each will merit thorough investigation. Size of potential donors (assets) is of significance, but usually less than whether they: (1) make grants of a size that fits the FHIA need; (2) make grants for the type of support FHIA is seeking; (3) are not restricted to subject areas of giving other than that of the FHIA.

Concurrently individual approaches to specific target groups should be formalized as well as strategems for possible joint efforts. A multiple institution approach is often encouraged by private and public funders.

B. Stretegies Specific to Target Groups

Each target group (as well as individual organizations within each group) has its own set of purposes mandates, and motivations. It is imperative that the Foundation understand what they are and speak to them in soliciting cooperation and support. Examples of varying approaches are given for three different groups.

1. Corporations

Corporations are best approached in face-to-face meetings with individuals holding the power to make decisions. For each meeting, F.H.I.A. should prepare a prospectus, covering the following points:

a. The significance of FHIA and its project(s). A detailed justification for why task (project) items are needed. A statement as to how the project will be managed to achieve its objectives (have back-up documentation for cost items and legitimate bottom line).

b. Identification with the corporation's objectives and goals including any published rules and regulations.

c. Detailed information:
   (i) Total amount of investment sought.
   (ii) Effective date - when FHIA needs the award and payment termss.
   (iii) Scope of work - activities to be performed.
   (iv) Line item amounts.
   (v) Any special terms or conditions (patent rights, confidentiality of data, etc.).
   (vi) The indirect cost rate used.
   (vii) Qualifications of performers (special skills and track record).
   (viii) Degree of FHIA participation as well as other investors.

In preparing for the corporate presentation it will be important to keep in mind a variety of factors regarding the Foundation which may prove significant to the corporation:

FHIA is a tax-exempt, charitable organization
FHIA is not politically oriented
FHIA is not antibusiness
FHIA mission is non-controversial
FHIA is neither risky nor untried, but the produce of years of prior experienceand talent
FHIA is profit oriented in the sense that it has a goal of providing improved income generation to several sectors of the Honduran and regional economy.
FHIA is geographically desirable in terms of United States vested interest, current and future. FHIA is an important, early component of the Caribbean basin initiative.
FHIA is timely and is the result of careful planning by teams from the public and private sectors.
FHIA has adequate front-end funding, written expressions of endorsement from Honduran and United States leaders, public and private. FHIA has ten-year plan of work with needed core funding (reserves upon which to build a well-conceived research program).
FHIA's track record is the combined experience of its Senior Scientist Team, the men and women who govern (diverse and holding recognized positions of leadership) - these credentials are what count most in international agricultural research.

2. Individuals

The relationship between an individual donor and the Foundation will be quite personal. It must resemble a human relationship in that good communications are vital. Emotions such as pride in the Foundation's staff and work, concerns parallel to those of the Foundation and loyalty to its potential must be engendered.

Getting to know persons of means capable of supporting the Foundation and its staff is an important task of the person(s) entrusted with the development responsibilitly. Ideally these potential sponsors will be a part of important Foundation decisions. Their advice and insights should be sought and they must be thoroughly informed about the work of the Foundation.

Individuals have specific areas of interest they support. Written communication with them is best because it gives the donor something to retain and provides a basis for discussion with those from whom he or she seeks counsel. Most give at a specific time of the year. Over time it will be to major individual donors that the Foundation will turn first in times of emergency or special opportunity. This leadership audience will provide the Foundation with the standard of participation for the rest of its constituents. In addition, an individual is in a position to act much more swiftly than a foundation or corporation.

3. The PVO Community

The PVO community in Honduras has a deep level of involvement with the ultimate beneficiaries of this Project: the small farmers. Because of this fact there is a broad range of tasks which are mutually beneficial to the work of PVO's and the Foundation. Some of the areas of mutual interest include:

- Participation and development of working relationships in the formulation of FHIA goals, priorities and means of implementing policies for ag-research and technology for community development.
- Extensive availability and use of non-formal educational/extension channels to reach farm families.
- Reciprocal efforts aimed at emphasizing awareness of the social responsibility of professional scientists, researchers and technologists.
- Strengthening the informal research and development "Systems" in science and technology for development.
- Establishment of fellowship programs, networks and systems of information exchange.
- Encouragement of financial support for research in basic ag-science by multinational funding agencies.
- Development of a flexible program of small grants for PVOs with priority given to supporting agricultural activities of field level PVOs.

The PVO's represent a strong potential as collaborators in multi-institutional projects, and as a source of raising funds in the United States. These possibilities can be realized through active PVO participation in Foundation activities, most notably in planning and in dissemination of new technologies. Inviting representatives from the PVO community to participate on external advisory committees, and possibly in the General Assembly; is an easy first step in establishing this group as cooperators in the F.H.I.A.

V. Related Considerations

A. Parallel U.S. Foundation

A parallel U.S. foundation, The Friends of Central American Agriculture, Inc., was legally incorporated in the State of Delaware on June 20, 1984. This corporation will provide F.H.I.A. with a fund raising channel for tax-exempt donations from the United States.

B. Financial Schemes for Soliciting Support

In order to attract supporters to the F.H.I.A. cause, from its inception the Foundation must be able to express professional competence and financial strength. Not an easy task for a new institution, but possible.

In the initial years, while research programs are getting underway, competence will be best expressed by the calibre of people representing the Foundation (the Board and Executive Management) and the Senior scientists hired. It is a circular situation, in a sense, since the most qualified personnel also will require a show of financial strength over time before accepting positions with the Foundation.

The ten-year $20 million AID grant is the essential ingredient. It signifies confidence on the part of AID in the viability of this new institution. The technical team contracted during project development strongly recommended that AID and the Foundation consider alternative financial schemes in the use of the AID grant. Their argument is that AID financing can be used in ways to greatly augment the Foundation's development process.

The primary proposal is to make a single $20,000,000 grant disbursed in FY85. Of this total, $10 million would establish an initial operating endowment; $10 million would establish a challenge grant.

The objective of the $10 million operating endowment is to launch a private initiative. It is our belief that an endowment of this sort and quantity would provide the Foundation with the security and stability of financing to establish a solidly designed long-term research agenda and to immediately permit the Foundation's Board of Directors and Executive Director to enlist and develop the finest research, support and administrative staff possible to implement the programs.

The objective of the $10 million challenge grant is to enable the Foundation to present a credible challenge to public and private sources interested in supporting the work of the Foundation. Experience in the development field has proven that challenge or matching grants are very attractive to potential donors in contrast to seeking their assistance as sole supporters to a particular program: "Money makes more money."

The $10,000,000 operating endowment would be invested through a U.S. or Honduran financial institution in an interest generating account. Ideally, the interest accrued would be sufficient to cover core operating expenses in the initial years. The endowment would be established through a special agreement between the Foundation and AID outlining the purpose of the endowment, the use of funds, and procedures for disbursement and reporting.

The challenge grant would also be placed in an interest bearing account through a special agreement between the Foundation and AID. This agreement would include a matching or challenge schedule for the disbursement of funds, designated by year and, if desired, by activity to be financed (i.e. core operations and specific research projects).

Whether AID is willing to depart so radically from regular operating procedures is unknown. It need not mean that the Agency lose control over the project. Necessary conditions and reporting can be ensured through operational agreements between the Foundation and USAID in establishing the endowment funds. Quarterly and/or annual forecasts, work plans, and fiscal reporting requirements can be built into the use of the funds.

It is worth exploring other AID precedents for this type of financing. It is our understanding that AID DA grant money was used to establish an endowment for a Black University in the Southern U.S., six or seven years ago.

If the primary recommendation is not feasible, other options more in line with AID procedures should be developed. One might be the use of ESF local currency generations to establish the endowments.

Some variation of the above financial scheme would provide the Foundation a stable financial environment in which to operate. It would enhance its image as a private institution independent of the GOH and United Brands. It would also demonstrate a high level of confidence by AID in the Foundation and provide real leverage in attracting additional and on-going financing for the research programs.

In turn, such an endowment would enable AID to launch and assure the continuation of a major research effort in Honduras, which includes support to the private sector initiative in export diversification. It also provides a "different" kind of control over the AID funding by enforcing the challenge mandate. The financial scheme addresses the institution-building aspect of the project and its purpose by providing a "real" possibility of financial viability. The scheme might also simplify disbursement and accounting procedures.

C. Patented Research

There appears to be no concern on the part of prospective clients and cooperators relating to patent submission or protection. If a corporation wished to maintain privacy on research results, they would conduct such research themselves. The introduction of patents clouds the public service character the Foundation is to assume. All results of research conducted by the Foundation should be immediately and universally available to all interessted parties, in and out of Honduras.

Seeking research support with an aim to proprietary end-products is self defeating in terms of establishing the nonprofit, public service character desirable and could create division within the Foundation's research efforts. By and large the patent system is not accepted by the scientific community on the grounds that the free interchange of breeding and other materials is unduly restricted. There is at times, a limited amount of exchange between private companies, especially when they receive the original materials from public sources.

245

Patented research is not recommended as a course of action for the Foundation. Ultimately more will be lost than gained with such an approach.

D. Representation of Key Actors

The demand analysis summary revealed that two important target groups, PVO's and agriculturally-related traders/brokers, were not presently represented in the General Assembly. Since both these groups are strong candidates as dissemination channels and as supporters, their representation is recommended.

In addition to the general governing body, other representative mechanisms should be considered. In its plan of organization F.H.I.A. has made provision for external advisory committees and representation from all relevant actors in the Hoduran agricultural sector needs to be sought. In the case of the trader/broker companies a "task force" of six to eitht individuals from this group could be enlisted to serve as the export-crop promotion committee. Not only would this lend excellent guidance to the Executive Director, but would also foster the kind of communication and interest leading to commitment and financial support.

E. Training

A full-service, on-site training program ranks high on services anticipated by those interviewed. The Annex at La Lima appears to be serviceable for such an effort (training center). This would mean short courses in cooperation with various public and private groups. It can also serve as the focal point for cooperative efforts with the international research centers. It will require subsidy for the first three years and may eventually be close to self-supporting. But, it should be regarded as a major public relations tool of the Foundation and as such merits operational or core funding from the outset.

Exhibit A

PERSONS & ORGANIZATIONS INTERVIEWED REGARDING DEMAND FOR FOUNDATION SERVICES

PERSON	ORGANIZATION
Fernando Lardizabal	Presidente de Federacion Nacional de Agricultores y Ganaderos de Honduras Tegucigalpa
Ilsa Diaz Zelaya	Presidente de Federacion Nacional de Productores y Exportadores de Honduras San Pedro Sula
Ricardo Zablah	Presidente Asociacion Nacional de Exportadores de Honduras Tegucigalpa
Jorge Bueso Arias	Presidente Banco de Occidente Tegucigalpa
Jane Lagos de Martell	Presidente Universidad Privada de San Pedro Sula San Pedro Sula
Fernando Fernandez	Director of Training Centro de Agricultural Tropical (CIAT) Palmira, Colombia
Robert K. Waugh	Facultad de Agricultura Universidad de Florida Gainsville, Florida
George McNew	Cientifico Distinguido Universidad Estatal de New Mexico Las Cruces, New Mexico, USA
Frederick A. Bendada	Senior Vice President INTERCHEM (International Chemical Company) Tulsa, Okalhoma, USA
Randy Fleming	Standard Fruit Company (Castle & Cooke) San Pedro Sula & La Ceiba - 42-0820
Jimmy Neal Taylor	General Manager ALCON (Cargill) - Alimentos Concentrados, SA San Pedro Sula 54-0110/54-4490

Cont'd

Carlos Montegzume	CPS International (Almidones del Itsmo, SA de C.V. SAn Pedro Sula 54-4543/54-4548 (ALISA)
	AMAX (Rosario Resources Corporation) San Pedro Sula 54-3610/54-3934 Metals & Minerals
Paul Vinelli	Chase Manhattan Bank NA (Banco Atlantida) 54-3110 or 55-1181
Rene Morales Garazo Robert Brevet	Presidente Ejecutivo Industrial Hondurena de Alimentos, SA de CV San Pedro Sula 54-0528
Ralph Parkman	Sea Farms INC (Ralston Purina Compamy) Choluteca
Michael Facuse	Quimicas Dinant (Comercial Galovia) Tegucigalpa 32-3289
Peter Dumas	General Manager Honduran-American Chamber of Commerce Tegucigalpa 32-3191
	Shell Oil Company (Shell Exploration) Tegucigalpa Natural Gas & Chemicals
Jorge Roman, PhD	Dean Escuela Agricola Panamericana El Zamorano 32-2717
Dra. Dorcas de Gonzales	Director Executive Comite de Desarrollo y Emergencia National (CEDEN) Tegucigalpa 32-7938/32-1719
Bernard Packer	AFL-CIO American Institute for Free Labor Development Tegucigalpa 22-9480
Juan Alvarez	Agricultural Cooperative Development International Tegucigalpa 22-8048
Charles Winkler	Director Foster Parents Plan Tegucigalpa 32-4424

Cont'd

Damian Rogriguez	Director Eastern Mennonite Board of Missions and Charities Honduras Mennonite Church La Ceiba
Madre Pilar (see CEDEN)	Director Lutheran World Relief Nernandad INC San Marcos de Ocotepeque
Zoila Alvarez	Program Coordinator Meals for Millions (Freedom for Hunger FDN.) Tegucigalpa
Charles Geiser (see CEDEN)	Director Mennonite Central Committee San Marcos de Ocotepeque
Jose Elias Sanchez	Director Partners of the Americas Tegucigalpa 22-5621
John Chater	Director (FIELD) Vermont Partners Tegucigalpa 22-1573
Antonio Ramirez	Director Save de Children Federation (Federacion Desarrollo Juvenil Comunitario FEDEJCO) Tegucigalpa 22-9205/22-2882
Tom Hawk	Associate Director World Relief Corporation Tegucigalpa 32-7667
Ramiro Irabien de la Riva	Executive Director Honduran Federation of Private Voluntary Organization

Exhibit B

DEMAND ANALYSIS: INTERVIEW BRIEF DESIGNED BY TEAM AND USED IN ALL INTERVIEWS PRIOR TO POSING QUESTIONS RELATING TO POTENTIAL DEMAND.

BRIEF: PROPOSED HONDURAS AGRICULTURAL RESEARCH FOUNDATION

The purpose of the Foundation's programs will be to expand and improve the Honduras agricultural research system's response capabilities to the technological needs of farm families.

The Foundation, a tax-exempt, non-profit, pulicly supported (private) research foundation will focus on applied (adaptive) research and will be closely linked with regional and international research centers, private and publicly supported research centers, and related international centers such as CATIE, AVRDC, IFDC, etc.

The Foundation's headquarters will be located at La Lima using the United Brands Research Facility which is to be donated to the Foundation (existing buildings, laboratories, equipment, research data and testing facilities).

The Foundation will conduct its programs and collaborative or contract projects under the governance of an independent, international board of directors. It will operate as an autonomous administrative unit.

The Foundation will have three basic components:

- The Research and Training Program
- The Communication and Outreach Program (This is not the pp priority order)
- The Analytical Laboratory and Testing Services Program

The Research and Training Program will emphasize, in its initial work, three crop classifications:

- Basic Food Crops to meet the needs of Honduras
- Diversified Crops - principally for export
- Current, Traditional Crops - principally for export

The Communications and Outreach Program will provide effective support to research and extension activities with primary responsibility for materials production, dissemination, continuing evaluation and linkage with development of applied research results to reach the private sector and the farming communities and institutions (cooperatives, associations, federations, private voluntary organizations). Principal audiences for the Communications and Outreach Programs include: national and international agricultural research and education institutions; the Honduran national extension services (through or in collaborations with the Ministry units); producers, processing, trade and other private sector organizations; sources of contract, grant support and Honduran farmers and their families.

The Analytical Laboratory and Testing Services Program will provide diagnostic and technical services to public and private groups, including the Government of Honduras, farmer associations and cooperatives, feed, seed, fertilizer, pesticide and demonstration companies and organizations.

DEMAND ANALYSIS: SURVEY OF POTENTIAL USERS & CLIENTS FOR THE PROPOSED HONDURAN AGRICULTURAL RESEARCH FOUNDATION

Those interviewed were briefed on the goals and purpose of the Foundation. They were advised that the plan of work for the first year of operation had not been committed and that they could look to flexibility in the plan of work; the Foundation would initially use existing, renovated and remodelled facilities located at La Lima, with other demonstration sites possible.

These questions were asked:

- What research is currently conducted or contracted by your organization?
- What do you perceive your research needs to be at this time? Future?
- How do you fund your research at this time?
- Would you call upon the services of the Foundaton as outlined in your briefing?
- Would you consider cooperative projects with the Foundation?
- How would you fund such projects?
- Do you feel the establishment of this Foundation is important to your organization? To the national needs of Honduras? To Central America?
- Are there additional areas of research, training and communications you would like the Foundation directors and staff to consider?

Exhibit C

PVO COMMUNITY IN HONDURAS

The PVO groups in Honduras, many of whom are based in the U.S., Canada and Europe are a link with smaller communities and farmers. They have long histories of involvement at the grass roots level. They are potential clients of the Foundation's research and outreach and they have access to significant private (church-related) funding in the U.S., Canada and Europe if properly enlisted and involved.

Names	Principal Areas of Involvement
La Buena Fe Association	Agricultural training
Agricultural Coop. Dvlp. International	Agribusiness, Cooperatives
CAM International	Seeds, Food/Food Products
CARE	Agricultural training, food distribution centers
Catholic Relief Services	Agricultural training, Food/Food products, small enterprises, cooperatives
Christian Children's Fund	Cooperatives, integrated rural development non-formal education
Foster Parents Plan	Agricultural cooperatives, agricultural training, fish farming, Food/food products, animal husbandry
Global Outreach	Agricultural training
Lutheran World Relief	Agricultural training, agricultural cooperatives, Demonstration projects, animal husbandry, beekeeping, crop improvement, storage & small enterprises.
International Voluntary Services	Conservation, small enterprises, integrated rural development, land reclamation
Maryknoll Fathers $ Brothers	Integrated rural development, agricultural training, crop improvement, extension agents, food supply programs, conservation.
Meals for Millions/Freedom for Hunger	Agricultural training, fish farming, gardens, rabbits, food storage, management training

Cont'd

Mennonite Central Committee	Agricultural extension
Partners of the Americas and Vermont Partners	Integrated rural development
Moravian Church of American Inc.	Food/food products, food storage, research and field studies, seeds, transportation, agriculturists, crop improvement
Overseas Education Fund	Integrated rural development, extension agents, small enterprises
Rotary International	Agricultural extension
Save the Children Federation	Integrated rural developmenet, cooperative, literacy education, non-formal education, agricultural training, fertilizers, fish farming, food storage & preservation, intensive farming, irrigation, poultry
Partnership for Productivity International	Marketing, integrated rural development, crop processing, farm machinery
World Gospel Mission	Agricultural training
World Neighbors	Integrated rural development, non-formal education, agricultural training, conservation crop improvement, gardens, grains, land reclamation, pest control, vegetables
Southern Baptist Convention	Seeds, fertilizers
World Vision Relief Organization	Agricultural training, irrigation, vocational education
Others:	Us Peace Corps
	CEDEN Comite Evangelico de Desarrollo y Emergencia Nacional
	Governments of Australia, Canada, Provincial Government of Alberta (Canada)

Cont'd

Coordination in Development (CODEL)

InterAmerican Development Bank

SOS Villages Austria

EZE (Germany)

ICCO (Netherlands)

United Church of Canada

World Council of Churches

Interchurch Coordination Committee
for Development AID-ICCD-(Netherlands)

Many of the PVOs also have direct and immediate access to U.S. manufacturers of equipment, supplies (seeds, fertilizers, lab equipment, irrigation equipment, etc.) It would be wise to plug into this network through the PVOs rather than to invest funds and energies in building a separate linkage.

The church-related PVOs are also tied closely with the local churches and as partners over the years they have credibility and form their own extension system.

Exhibit D

DEVELOPMENT ASSISTANCE MEMBER CONTRIES

Canada
Germany, Federal Republic
Japan
Netherlands
Switzerland
United Kingdom
United States

MULTILATERAL INSTITUTIONS

European Economic Community
International Bank for Reconstruction & Development
International Development Association
Inter-American Development Bank
International Monetary Fund
United Nations Development Program
World Food Program

UNITED STATES BUSINESS FIRMS WITH AGRICULTURE-BASED OPERATIONS IN HONDURAS

Chase Manhattan Bank, N.A.
Bank of America
Alimentos Procesados
Antillian Cigars Company
Edwards Leaf Company
Bee Natural Honey Company, Inc.
Bayuk Cigars Corporation
Coffee & Coca International
Exxon Corporation
HOnduras Cigar Imports
John Deere & Company
Johnson Farm Machinery Company, Inc.
Leaf Tobacco
Phellips Dodge International Corporation
Plantain Products Company
Redfern Foods Corporation
Shell Oil Company

TRADING & SHIPPING LINES

Barber Blue Sea
Battachi M.S.A.
Canadian Westfal Larsen Line
Coordinated Caribbean Transport
Carigulf Lines
Cassline
Cia. Anonima Venezolana de Navegacion
Colsa
Costa Line
Compagnie Generale Martime
Delta Steamship, Inc.
Florerca Line

Cont'd

Flota Mercante Gran Colombiana
Gulf Chartering
Hapag Lloyd A.G.
Intraha
Karvasahi Kisen Kaisha Line
Libre Line
Lloyd Brasilero
Marine Trading Limited
Mitsui Osk Line Ltd.
Nedlloyd Lines
Nexes Lines
Nippon Yusen Kaisha Ltd.
Nordana Line
Pan Atlantic Lines
Saguenay Shipping Ltd.
Sanho Line
Sea-Land Service
Stream Lines
Transatlantica Espanola Streamline
Transfreight Lines
Taura Line
T.M.M.
United Yogoslav Line
Zim-Israd Navagation Co., Ltd.

AMERICAN FIRMS, SUBSIDIARIES, AND AFFILIATES -- HONDURAS

TEGUCIGALPA, D.C.

BANCO ATLANTIDA, S.A.- Plaza Bancatlan, Blvd. Cetroamerica, Tegucigalpa, D.C. This commercial bank is affiliated with the Chase Manhattan Bank of New York City. Branches throughout Honduras. Dr. Paul Vinelli, President. Tel. 32-1050.

BANCO OF AMERICA N.T. & S.A.- Centro Comercial Los Castanos, Apartado Postal 199, Tegucigalpa. A branch of the Bank of America of San Francisco, California. It has a branch in San Pedro Sula. Mr. Victor Paz. Tel. 32-8505.

ESSO STANDARD OIL, S.A. LTD. - La Burrera, Comayaguela, D.C. Wholly-owned subsidiary of Esso Standard Oil Co. of New Jersey. Distributors of petroleum products and automotive accesories. Mr. Carlos Molina, Manager. Tel 33-4080.

LLE HONDURAS, INC.- Bufete Gutierrez Falla, Edificio TAN, Tegucigalpa, D.C. Mining company applying for consession areas. Subsidiary of Louisiana Land & Exploration, Inc., Suite 1200, 225 Baronne St., Box 60350, New Orleans, Lao. 70160. Lic. Laureano Gutierrez Falla, Representative. Tel. 22-2084.

MOBIL EXPLORATION HONDURAS, INC. - Bufete Batres, 7o. Piso, Edificio Cantero. Petroleum emploraton. Home office: Mobil Oil Corporation, P.O. Box 900, Dallas, Texas, 75221. Legal representative: Lic. Joaquin Donato Alcerro D. Tel. 22-0319.

OCCIDENTAL DE HONDURAS, INC.- Callejon El Olvido No.113. Petroleum exploration. Subsidiary of Occidental Petroleum Corporation, 10889 Wilshire Blvd., Los Angeles, California, 90024. Lic. Carlos Roberto Reina, Representative, Tel. 22-3760.

RANCHO LORENZO, S.A.- Colonia Palmira, Ave. Republica de Chile No.307, Tegucigalpa, D.C. Affiliate of Alberti Foods, Inc., Hindsdale, Illinois. Meat packing plant in Catacamas, Olancho. Mr. George Duke, Manager, tel. 32-2692.

UNION OIL COMPANY OF HONDURAS.- Edificio Aseguradora Hondurena; Apartado Postal No. C-48, Tegucigalpa, D.C. Exploratory oil well drilling. Home office: Union Oil Co. of California, Union Oil Center, Los Angeles, California 90017. Mr. Juan Agurcia, Representative. Tel. 22-9093.

SAN PEDRO SULA

COMPANIA DE CREDITO, S.A.- Apartado Postal No.321; Edificio Rivera y Compania. Commercial credit institution. Affiliated with the First National Bank of Boston. Mr. J. Arturo Sosa, Manager. Tel. 54-1570.

COMPANIA DE SACOS CENTROAMERICANA, S.A.- Carretera a La Lima; Apartado Postal 136. Manufacturer of burlap and cotton bags for coffee, sugar and flour. Home office: Bemis Co., Minneapolis, Minnesota. Mr. Jose L. Mejia, Manager. TE. 54-3618.

EMPACADORA CORTES, S.A. DE C.V. (CORSA).- Carretera a Puerto Cortes. Fresh, chilled and frozen beef slaughtening and packing house for export. Associated with Alberti Foods, Inc., Hindsdale, Illinois. Mr. Jose Andonie Fernandez, Manager. Tel. 54-4751.

HOWDI (Honduras Oil & Water Drilling Industry).- Apartado Postal No.162. Calpules, Cortes. Oil and water drilling and mineral exploration. Mr. Garret D. Combs, Manager.

PARKER TOBACCO CO.- Apartado Postal 248 9a. Ave. 1-2 Calles S.O.; affiliated with Parket Tobacco Co., Maysville, KY Tel. 54-2442; Mr. Frazer Parker, Manager.

ROSARIO RESOURCES CORPORATION.- Minas El Mochito, Santa Barbara; P.O. Box 502, San Pedro Sula. Operates silver, lead and zinc mine in El Mochito. Subsidiary of AMAX, Inc. Mr. Rafael Garcia, Manager. Tel. 54-3610

SHELL EXPLORATION HONDURAS.- 17 Ave. N.O. No.11. Petroleum exploration. Subsidiary of Shell Oil Co., One Shell Plaza, P.O. Box 2463, Houston, Texas 77001. Lic. Edgardo Dumas Rodriguez, Representative. Tel. 54-0556.

DEPARTMENT OF ATLANTIDA

LA CEIBA

FABRICA DE MANTECA Y JABON ATLANTIDA, S.A.- Manufacturer of vegetable oils and margarine, lard, soap, copra bran and cattle feed. Importer of fats, suet, caustic soda for own use. Branches in San Pedro Sula, Tegucigalpa, Santa Rosa de Copan, and Choluteca. A subsidiary of Castle & Cook., Honolulu, Hawaii. Mr. Luis Rietti, Manager. Tel. 42-0902.

STANDARD FRUIT COMPANY.- Banana grower and exporter. Also grows citrus fruits and pineapples for export. Operates various subsidiaries including soap and vegetable oil plant, the only brewery in Honduras, a box and plastic bag plant, and a dairy livestock farm. Home office: Castle & Cooke, Inc., Honolulu, Hawaii. Mr. David Green, Manager, Tel. 42-0820.

DEPARTMENT OF CHOLUTECA

CHOLUTECA

SEA FARMS DE HONDURAS.- Technical assistance and experimental operation in cultivating shrimp. Affiliated with Sea Farms, Key West, Florida. Mr. Ralph Parkman, Manager, P.O. Box 33, Casa de Manuel Corrales, Choluteca, Choluteca. Tel. 82-0187.

F. Social Soundness Analysis

A. Description of Target Groups

1. Basic Grain Growers

1.1. Available Census Data

In Honduras, the cultivation of basic grains is done essentially on minifundia and small farms. According to the last agricultural census available, 85% of corn production, 84% of bean production, 87% of sorghum production, and 73% of rice production was from farms less than 15 hectares in size. Basic grains, however, are not cultivated with the same intensity in all farms. The most commonly cultivated crop is corn, second is beans, then sorghum, and finally rice. According to that census, 85% of farms under 15 hectares cultivated corn, 20% cultivated beans, 14% cultivated sorghum, and on only 8% was rice grown.

Corn tends to be cultivated alone during the first planting season of the agricultural cycle. In only a reduced number of farms are beans cultivated at the same time. Beans are generally cultivated during the second planting season in those farms where ecological and agronomic conditions permit it. Sorghum tends to complement corn cultivation, particularly in the dry regions of the country. Rice is the least common crop since it is cultivated only in certain ecological areas. In the case of parcels where rice is cultivated, crop rotation does not exist.

Parcels used for the cultivation of basic grains are rather small. Depending on the size of the farm, parcels cultivated with corn range from 1.0 to 2.0 ha. They range from 0.5 to 1.0 ha. in the case of beans, from 1 to 2 ha. in the case of sorghum, and from 0.5 to 1.0 ha. in the case of rice.

According to census data yields tend to be low. Yields are 1200 Kilograms/ha. in the case of corn, 520 Kilograms/ha. in the case of beans, 750 Kilograms/ha. for sorghum and 1400 Kilograms/ha for rice.

1.2. ATAC Survey

In 1976, the American Technical Assistance Corporation (ATAC) did what still constitutes the most comprehensive survey of the small Honduran farmer. This study was conducted at the request of AID/Honduras, and it was used as background information for the 1978 Agricultural Sector Assessment. This survey was conducted in three geographical areas of Honduras: (a) the North, including the Departments of Cortés, Western Yoro and Atlantida, characterized by the existence of fertile soils, high rainfall and easy access to markets; (b) the South, including the Deparments of Valle and Choluteca, which is a dry area where both lowland and hillside agriculture is practiced depending on the sub-region; and (3) Olancho, where flat tillable land is available and where the wet and the dry seasons are well established. Regions studied were chosen on the basis of priorities established by the GOH/AID agricultural sector

program. The sample selected included both individual and collective farmers, as well as (formal) credit users and non-users. Since credit reaches about only 10% of all farms in the country, the survey data presented below refers exclusively to individual farmers within the sample who are working without credit.

The most relevant conclusions of this survey for our purposes can be summarized as follows.

(1) Individual farmers in the sample were cultivating on the average an area having about six hectares. The typical individual farmer interviewed owned 73% of the land cultivated. The other 27% was rented and/or used gratuitously. Not all land used was in one parcel, and parcels cultivated were not necessarily contiguous. The average individual farmer in the sample cultivated at least two parcels.

(2) The average individual farmer in the sample used 58% of land available for the cultivation of crops and 21% for natural and improved pastures. In addition, 5% of the land was left fallow for improving productivity; 7% was suitable for agriculture, but it was not being used because of lack of resources, and the rest was used for buildings and infrastructure or consisted simply of mountain and/or woodland.

(3) As could be expected from these data, 67% of gross farm income came from crops, 28% came from animals and by-products, and 5% from forestry and miscellaneous products.

(4) In consonance with the census data discussed earlier, 78% of the average gross crop income came from basic grains (essentially corn), 10% came from other annual crops, and 12% came from biennial and perennial crops including fruit crops. Important regional variations in this crop distribution were nonetheless observed. More diversified farming prevailed in the South, whereas concentration in basic grain cultivation was more common both in the North and in Olancho. Basic grain production accounted for only 56% of gross crop income in the South, but it accounted for 89% and 94% of agricultural production in the North and in the South. Furthermore, because of climatic conditions, sorghum cultivation is more characteristic of the Southern (Pacific) region, and rice cultivation is more common in the Northern (Caribbean) area. In the South, other crops such as cotton, canteloupes, watermelons and sugar cane account for 29% of total crop production.

(5) With respect to cropping systems, about two thirds of those who are basic grain growers plant the land only once a year, and in most cases this is done during the first planting season of the agricultural cycle. In all regions, the most common crop grown is

corn. In addition, in the Northern Region and Olancho, corn is planted alone, but in the Southern Region corn is planted in combination with sorghum. As could be anticipated from the foregoing, the second most common crop cultivated varies depending on the region: rice in the North, and beans in Olancho.

(6) 48% of gross income from animal production comes essentially from either changes in inventory value or sales of cattle, 26% comes from the production of either milk or dairy products, and 22% comes from the production of eggs.

(7) Technology utilized is labor intensive, and typical small farmers depend on their families for required labor inputs. 69% of man-days required by small farmers were provided by unpaid family members. However, when value is assigned to these labor inputs and regional variations are taken into account, labor alone accounts for 59% to 77% of all farming costs. On the other hand, the data collected showed that in the majority of individual farms visited, improved seed varieties, fertilizers, insecticides and herbicides were not being used. Among the individual farmers interviewed who are essentially basic grain growers, 55% use seed harvested on the farm, and even when seeds are purchased, they are not necessarily improved varieties. In addition, 96% do not use any kind of fertilizer, whether natural or chemical, and 72% do not use either herbicides or insecticides.

(8) 95% of individual farmers visited had not received any technical assistance from development agencies, neither public nor private. Of the additional 5%, only 1% received assistance in basic grain cultivation. More formal training was also uncommon among small farmers interviewed. Only 4% of individual farmers visited had participated in formal training sessions. In most cases, training was provided by peasant unions and the subject matter of short courses given was Cooperativism. The expressed need for technical assistance was rather high. About half of those interviewed manifested an interest in receiving TA for basic grain cultivation. Important concerns for future technical assistance programs were: (a) the use of fertilizers and (b) disease and pest control.

According to recent MNR reports, the implementation of the National Basic Grains Program would have allowed for the introduction of some improvements in its extension service. The 1984-86 Implementation Plan for that program indicated that in the 1982-83 agricultural year the extension service provided technical assistance to 23% of the farm area cultivated with corn, to 28% of the area cultivated with beans, to 11% of the area cultivated with sorghum and to 61% of the area cultivated with rice. Results of the assistance are impressive since average yields for each of these crops in the assisted areas are: 2560 Kilograms/ha. for corn, 720 Kilograms/ha. for beans, 1690 Kilograms/ha.

for sorghum, and 2800 Kilograms/ha. for rice. In all cases, these yields are higher than those reported by the agricultural census discussed earlier. In addition, such higher yields tend to be reflected in the contribution of the production of assisted farms to total basic grain production, particularly in the case of corn and rice. According to the 1984-86 Implementation Plan cited, the corn production of assisted farms represented 42% of total corn production in the country. In the case of rice it represented 88%.

(9) Corn, beans and sorghum are produced for the market and for on-farm consumption. Nevertheless, the proportion of production which is sold and consumed varies depending on the crop. In the case of corn and beans, producers sell approximately 60% of production and keep 40% for family consumption. In the case of sorghum, however, these proportions are inverted: 40% is sold and 60% is kept on the farm. This inversion is partially a result of the fact that sorghum is used for both human and animal consumption. Rice, on the other hand,

is essentially produced for the market. Rice producers tend to sell 85% of their production. In practically all cases, farmers selling their production do so at harvest time. It is not customary for farmers to keep significant proportions of their production for future sale when sale prices have increased. In fact, many of the small producers are forced to sell production in advance in order to have access to needed cash before crops are harvested. Credit tends to change this situation inasmuch as credit users interviewed had the possibility of selling their production at harvest, and many credit users even kept production harvested for future sale.

(10) 72% of net family income in the case of families headed by the small individual farmers interviewed was generated on the farm. The other 28% came from off-farm activities. Almost half of this off-farm income, however, was earned by family members that worked on somebody else's farm. The other half came from non-agricultural pursuits.

2. Producers of Traditional Export Crops

2.1 Introduction

Bananas and coffee are the first and second most important agricultural export crops in Honduras. In 1982, they accounted for 53% and 37% respectively of the country's agricultural exports. Given the importance of these two crops in the economy, our discussion on producers of traditional export crops will concentrate on banana and coffee producers.

2.2 Banana Producers

The role of the various participants in the country's banana industry has changed significantly during the past twenty years. According to available data, production is being gradually transferred to national producers, and over time foreign companies are becoming more interested in being involved in the marketing of production.

In 1964, there were about 15,000 ha. of land producing bananas. Total banana production was 17.5 million 40-pound boxes. That year, both the Tela Railroad Company (TRCo) and Standard Fruit (SFCo) cultivated 89% of the land commercial planted to bananas and were responsible for 88% of total production. By 1982, however, the situation had changed significantly. The banana area cultivated had increased to 17,594 ha. and total production was 45.5 million boxes. Foreign companies cultivated only 57% of that area and produced 60% of total production. In other words, during the 1964-83 period, the area of land cultivated by local producers increased from 11% to 44%, and their share of production increased from 12% to 40%. Despite these changes, in 1964 as well as in 1982 all of the fruit exported was marketed either through the Tela Railroad Company or Standard Fruit, regardless of who produced it. (Del Monte is currently exporting bananas from Honduras, but these activities were initiated in March 1984.)

The data above indicates that the production share corresponding to national producers did not increase proportionately with increases observed in the area cultivated with bananas. This is a result of the technology level of their farms as well as of agricultural practices characteristic of these producers. Productivity varied according to the type of farmer. In 1982, foreign companies produced an average of 2,810 40-pound boxes of bananas per hectare, while national producers produced only 2,330. Given this 21% production differential, it is feasible to ask why foreign companies are less interested in production than before. Higher productivity implies lower production costs and higher profits. Consequently, these companies should be interested in expanding their own production rather than in buying it from national producers. According to Slutsky and Alonso (1982), the reasons for the trend observed are both historical and economic.

National producers selling their production to TRCo are, for the most part, individual farmers. COHBANA (1983) reported 94 such producers. In 1982, they cultivated a total of about 3,600 ha. and produced 7.9 million boxes. 84 of them planted an average of 20 ha., 9 cultivated an average of 127 ha. and one of those producers, a larger company, cultivated 950 ha. Most of these producers, particularly the smaller ones, were motivated to get into banana production by TRCo in the 50's, and many of them were ex-company employees. Slutsky and Alonso seem to suggest that the support provided to these producers by TRCo was part of a strategy to solve problems the company was then facing. The most important problems were high labor costs, crop diseases, low market prices and social conflicts with nearby settlers who claimed access to land that the company kept fallow for future use. As a

response to these problems, TRCo planted new banana varieties which were more productive and more resistant to existing diseases, optimized the use of labor and supported national producers. These producers had lower labor costs and could take over the production risks previously assumed by the company. To get many of these producers started, TRCo rented the necessary land to them, provided them with both production and investment credit for necessary infrastructure (e.g., irrigation and drainage works, bridges), and assumed the transportation of production to the port of shipment. The producer was expected to provide the labor inputs and was responsible for the cultivation and maintenance of the farm. TRCo stopped providing credit to these producers after Hurricane Fifi in 1974. Since that time, it has been replaced in this role by COHBANA and BANAFOM. These institutions also assumed partial responsability for providing farmers with needed technical assistance. Yet, to date, TRCo still provides technical assitance with respect to fertilization, disease control and packing. According to COHBANA's estimates, individual banana cultivators currently generate about 56,000 man-months of employment per year. All labor requirements are supplied by hired labor.

The story of banana cultivation by producers who sell their production to SFCo is quite different. These producers are four cooperatives, one empresa asociativa, and three projects sponsored by COHBANA, of which two are controlled by this institution. Collective undertakings have 1,838 members and cultivate approximately 3,700 ha. of land. COHBANA-owned projects provide employment to 495 workers on a permanent basis. These workers cultivate 366 ha. of land. In 1982, all of these farms produced 10.3 million boxes of fruit. Production per hectare among these farmers has been generally higher than that observed among other producers who sell their production to TRCo.

The cooperatives selling their production to SFCo were organized in the 60's. They are located in the Sula Valley, most of them constitute what is known as the Guanchias Complex and were part of the most important land adjudications carried out by INA at that time. These land adjudications solved the long disputes occurring during the first stages of the Honduran peasant movement between ex-banana workers, fired after the 1954 strike, and both TRCo and large national landowners. Immediately after the adjudications took place, land was used almost exclusively for the cultivation of basic grains. Some time later, however, a crop diversification program was promoted both by INA and UNAH. Through this program, bananas became the most important source of income. These cooperatives currently cultivate about 1,423 ha. with bananas have 360 members and, according to COHBANA's estimates, generate 18,800 man-months of employment per year.

The empresa asociativa that sells its production to SFCo is of Isletas. It was organized in 1975 when SFCo decided to abandon some of the farms affected by Hurricane Fifi. To avoid a massive problem of unemployment, INA cancelled its long-term lease to SFCo and adjudicated the land recuperated thereby to ex-banana workers. At the outset, Isletas had only 207 members. They were responsible for initiating the rehabilitation of the plantation and for marketing eventual production. Since it was organized, Isletas has gone

through two development stages: rehabilitation and consolidation. During the first stage, INA and COHBANA provided the needed financial and technical assistance to begin production. INA also acted as intermediary between Isletas and SFCo for marketing the fruit. During the second stage, beginning in 1978, COHBANA has been responsible for providing credit. Technical assistance has been a shared responsibility between COHBANA and SFCo, but the latter has continued to play the more important role. COHBANA also replaced INA in its intermediary role in the marketing of production. In 1982, this empresa asociativa had 1,350 members and cultivated about 2,000 ha. with bananas. Isletas generates about 27,000 man-months of employment per year. Over one third of these labor inputs are provided by hired labor.

Prices paid to producers by the exporters are generally set through negotiation and are based on the quality of production sold. Small individual farmers selling their production to TRCo, however, are at a disadvantage. In compensation for the financial and technical assistance provided to these farmers, TRCo has obtained priority over other exporters for the purchase of their production. Consequently, no negotiations take place in their case, and prices are established unilaterally by the purchaser. In addition, quality criteria utilized to buy the production are different from those utilized in the case of larger producers. What is taken into consideration is not the length of bananas, but the size of the bunches. The price of larger bunches may be as high as that of second quality bananas, defined as such by fruit length, but the price of small bunches is much lower. Smaller bunches may be valued at half the price of either larger clusters or second quality fruit. It is possible that these price differentials are artificial inasmuch as they are not reflecting prices paid for bunches of different sizes and/or bananas of different lengths on the international market.

Exporters, in addition, are making profits for two reasons by buying production from local producers. First, the export cost of a box of bananas produced by local producers is lower than that of a box produced by exporters. And second, purchase contracts in the recent past have generally required producers to pay for the packing costs as well as for the in-country transportation costs. These contracts have required that such an important packing commodity as cardboard be purchased from industries owned by the exporters. In addition, exporters have been renting the packing equipment to producers and have been involved in the transportation of production from the farm/packing house to the ship. Ellis (1976), cited by Slutsky and Alonso, has estimated that the export cost of a 40-pound box of bananas produced by local producers is 10% cheaper than that of a similar box produced by exporters. Slutsky and Alonso have argued that this difference is a result of the lower cost of labor among local producers. Ellis has also analyzed the structure of the export cost of bananas and, depending on the type of producer and exporter, commodities and services in which exporters are involved represent from 37% to 41% of that cost. As a means of comparison, it is noteworthy that according to Ellis's analysis, the price paid to the producer for his product represents 33% of that same export cost. In other words,

through commodities and services sold to local producers, exporters may be earning a higher gross income than the producers themselves. One of the important issues of projects supporting export crops is how to make sure that higher profits remain in the hands of producers.

According to 1982 COHBANA estimates, the banana cultivation activities in which TRCo and SFCo were involved that year generated a demand for 128,000 man-months of labor. This is equivalent to approximately 10,700 permanent positions. According to BCH estimates for 1982, these two companies employed a total of 19,700 persons for both on- and off-farm banana activities . It is generally known that banana workers are among the best paid workers in the country, if indeed not the best paid. While daily salaries earned by agricultural workers in general range between $2.00 and $3.00, the basic daily salary for a banana worker is $7.00. In addition, banana workers have important fringe benefits such as paid holidays, free health care for themselves and their dependents and, in some cases, free housing. Banana cultivation has also changed the standard of living of cooperative members in the Guanchias Complex. In fact, cooperatives within this complex are often cited as the success stories of the Honduran cooperative movement, and have inspired government programs in rural areas. The cultivation of bananas has also made a difference for members of the Isletas empresa asociativa. In their case, however, success has not been as significant due to the political and managerial problems that this organization has confronted. It is unfortunate that a comparative study of the standard of living of these different banana producers with respect to other categories of producers is not available.

Bananas are an attractive crop for many farmers. According to COHBANA, over the last twelve months 14 different cooperatives in the Sula and Aguan Valleys have requested feasibility studies to cultivate a total of 5,855 ha. of land with bananas. These studies were not carried out because there is currently no funding available to expand the area cultivated with bananas in the country.

2.3. Coffee Producers

The 1979-80 Coffee Census conducted by IHCAFE reported the existence of 40,000 coffee producing areas in the country. The majority of these areas were within larger farms. 80% of these areas had less than 3.5 ha. The typical size was 3.0 ha.

In 1978-79, IHCAFE conducted a study to establish the socio-economic profile of the small coffee producer. This study was carried out in the Comayagua highlands, and the sample included 249 cases. Sample farmers were selected at random from the population of small coffee producers identified in 21 different highland villages in the region visited. Small coffee producers were defined as farmers having up to 3.5 ha. in coffee.

According to the results of that study, small coffee farmers interviewed were cultivating up to 7.0 ha. of land. The average size of the coffee-producing area, however, was 1.5 ha. The major conclusion of this study was that, given prevailing land use patterns, the time dedicated to basic grain cultivation throughout the year and the farmers' own self-perception, small coffee producers are essentially small farmers who cultivate coffee as a cash crop. The main distinction between this group and either sharecroppers or basic grain growers is their access to more land. Small coffee producers visited were rural migrants from nearby areas that came to the region visited in search of land during the 60's. They are old settlers who have expanded assets over time. Coffee cultivation constitutes an alternative to complement the family's income.

The major impact of coffee cultivation on the socio-economic condition of coffee producing families seems to be on their nutritional status since profits earned through the sale of coffee are primarily used to satisfy basic needs, particularly food. Other socio-economic indicators, however, do not vary much from those characterizing basic grain growers in the area studied. As in the case of these other farmers, families of small coffee producers comprised an average of 6.5 members. Yet, they lived in one-room houses, made out of adobe or bahareque, with compacted dirt floors, and no sanitary system, not even latrines. In addition, prevailing poor environmental sanitation conditions affected the health status of family members. Gastro-intestinal diseases were common and were the main cause of death among children under six years old. Only 45% of school-age children in the sample were enrolled in school, and 60% of the family members 16 years old and over were illiterate. The average number of school year attended among the literate was two years.

Despite the fact that the coffee producers interviewed had more access to land than basic grain growers, only 27% reported that land cultivated with coffee was their own. The rest cultivated coffee on occupied land, either national or ejidos. This land tenure arrangement probably affected access to credit and, in turn, the technification level of the farm. 72% of those interviewed had not received any form of credit during the two years preceding the survey. In addition, 94% of farmers interviewed cultivated an old Bourbon coffee variety referred to as "creole" coffee characterized by its low yields; 70% did not use fertilizer and 64% did not even prune their trees. Access to technical assistance was also limited. 70% of those interviewed had never received a visit from a coffee extension agent, had never been exposed to any type of training, and had not participated in any type of farm demonstration or field trip. Farmers visited produced less than 500 kg/Ha of dried parchment-free coffee.

There are five different stages in which coffee is sold: (a) Flower, representing the sale of crop when the bush is in the flowering stage; (b) Berry, which is the sale of coffee right after harvest and before any processing; (c) Wet parchment bean, which is the sale of production after an initial processing stage; (d) Dry parchment bean, which is the sale of production after intermediate processing; and (e) Dry parchment-less bean,

which is the sale of the totally processed unroasted coffee bean. Farmers in the sample do not always sell their production at the same stage of processing. However, the most common practice is to sell it right after harvesting at the farmgate or in a nearby town. The second most common practice is to sell it at the flowering stage. Farmers selling production right after the harvest confront one of two situations. They either cannot pay the transportation costs to take it into a marketplace where better prices may be obtained, or they cannot afford to take it to a processing center, where a fee is charged for the service. Some of those who sell it at the flowering stage, on the other hand, do not even have the necessary liquidity to pay for harvesting costs. Others sell it at that stage because the terms of credit provided by important commercial firms may so require. Other studies (Hernandez and Zuniga, 1983) have shown that the marketing of production may be related to an informal credit system. Big store owners in coffee producing areas may be involved in the coffee processing business. They may provide small farmers not only with needed tools, inputs, and immediate consumption goods on credit, but also with cash, particularly during the period of highest labor demand. Credit is generally provided under the condition that production is turned over to them for future processing and sale. When this type of credit is granted, the coffee grower must sell his production before the harvest, and the lender generally sets the price of coffee. Farmers participating in these transactions, however, do not sell all of their production through this mechanism. They try to compensate for low prices received from these lenders by processing, to the extent possible, the part of the harvest not sold at the flowering stage. Nevertheless, the processing technology utilized is rudimentary and, as a consequence, most of the coffee cleaned and dried by the these farmers is of lower quality, cannot be exported, and must sold domestically for a lower price. Coffee farmers who are members of marketing cooperatives have access to improved marketing channels and receive better prices for their production.

AID's agricultural development program includes two projects which will have an important impact on small coffee producers: the Small Farmer Titling Project and the Small Coffee Improvement Project. Through the first effort, fee simple titles are being provided to a significant number of small producers who are squatters. Possession of these titles provide farmers with required collateral to obtain supervised production and investment credit from the banking system. Through the second project, IHCAFE has abandoned its medium-size farmer orientation and is developing its institutional capacity to provide adequate extension services to small producers.

IHCAFE's capacity to provide assistance to its new clientele, however, remains limited. The target group for the project mentioned is 3,000 farms. This represents less than 10% of the country's small coffee farmers, with the vast majority of national producers being excluded from project activities. When the Titling Project begins to accomplish the results expected, IHCAFE's efforts will be complemented by the technical assistance that banks may provide to clients as part of their supervised credit programs. Such

complementary activities, however, will still be insufficient to satisfy the anticipated demand for technical assistance among coffee producers. Any programs interested in disseminating agricultural research findings to this target population will need to rely on the expansion of IHCAFE's extension service, as well as on the expansion of similar services provided by private sector institutions such as the National Association of Coffee Producers (AHPROCAFE) and service cooperatives.

Improved processing and marketing mechanisms for coffee production will also need to be instituted, particularly if technologies introduced through future farm technification programs increase production. For many, middlemen processing coffee are a necessary evil. This argument, however, needs to be considered in greater depth particularly because of the impact that the sale of unprocessed coffee has on the income of producers. As indicated earlier, the producer generally receives a price that increases commensurately with the degree to which the coffee is processed. In addition, price variability appears to be less at the higher levels with processing. An evaluation of the Small Farmer Coffee Improvement Project conducted in 1984 recommended that a study be undertaken on the possibility of carrying out some research and development on small scale coffee processing equipment, and the eventual introduction of such equipment into project activities. This evaluation also suggested that the Mission's Rural Technologies Project, currently being implemented, might carry out this task.

3. Producers of Non-Traditional Export Crops

3.1. Introduction

Honduran producers of non-traditional export crops generally grow fruits and vegetables. In many cases, they are members of either production or service cooperatives. Promotion of new export crops among these producers has been generally a joint effort involving government agencies such as INA and MNR, international donors such as AID who work through specialized consultants, and exporting companies. To present a picture of who these farmers are, a profile of melon and cucumber producers associated with service cooperatives currently receiving AID support through the Agricultural Sector II Program follows.

3.2. Regional Cooperative of Southern Horticulturalists, Ltd. (CREHSUL)

Melons were introduced in Southern Honduras in the early 70's. It was believed that this was as an adequate cash crop for farmers in the region since most of them were small basic grain growers, with limited access to land. Melons had certain advantages over other cash crops suitable for the area, such as sugar cane and cotton. These advantages lie in the fact that: (a) melons can be a profitable crop even when cultivated on a small scale; (b) they can be cultivated during the slack period of the agricultural cycle, thus allowing for intensive land use and generating employment in a zone of generalized poverty; and (c) they can be harvested during a period of high demand in the North American market. In supp[illegible] of melon producers in this area, and particularly land reform beneficia[illegible] INA bought a melon packing

plant in the mid 70's . INA provided free access to this packing facility to Water and Land Prodcucts, Inc. (P.A.T.S.A.), a subsidiary of United Brands. In exchange for this, PATSA was expected to market exportable fruit in the United States, to promote melon production in the southern region, and to train small producers on the plant's operation. In addition, an inter-institutional committee to support melon cultivation was created. This committee was made up of MNR, INA, BANADESA and producers, and it constituted the basis for what eventually came to be known as the Unit of Technical Assistance for Melon Production (UATM). This unit now has 14 technicians which provide technical support to producers.

Initial institutional support made available to farmers and the existence of an assured market were important factors in inducing them to cultivate melons. As originally intended, this became an attractive crop for small individual farmers having less than (20) hectares of land as well as for production cooperatives having an average of (5) hectares per member. Individual and collective farmers that started cultivating melons were basic grain growers who also cultivated some sugar or had small scale livestock operations. Although neither of them were and are exclusively melon producers, this crop has become an important source of on-farm income, if not the most important. This conclusion is particularly true for collective farmers who dedicated significant farm area to the cultivation of cashew. The production of melons provided the necessary income while cashew plantations were growing. This may continue to occur even now that cashew production has started, because farmers have not been able to obtain the necessary credit to process and export the harvest.

In 1978, melon producers in Southern Honduras decided to organize CREHSUL, a service cooperative that could market their production and represent them before public institutions supporting the cultivation of this crop. Up to 1983, CREHSUL was responsible for negotiating floor prices with PATSA and for locally marketing fruit not meeting the quality standards established by this exporter. In addition, it co-signed loans provided by BANADESA to affiliated members, and it played a role in negotiating technical assistance contracts with MNR and INA and in the creation of the UATM mentioned earlier. In 1981, CRESUL bought INA's packing plant. This purchase did not mean, however, getting involved in packing fruit. CREHSUL decided to lease this plant to PATSA under terms similar to those established by the old agreement with INA.

The structure of CREHSUL was changed in 1983 as a result of assistance requested from AID. This restructuring converted CREHSUL into a multiple service cooperative providing farmers with credit, technical assistance, agricultural inputs and other essential commodities to be sold at market value and with marketing services. It is now managed by a professional staff, and it is expected that it will eventually become self-financing. Currently, it is being capitalized through membership fees, a fee charged for the administration of loans made by BANADESA to affiliated producers, profits made through the sale of inputs and commodities, and the fees charged for marketing production It is also expected that by its fourth year of operation, CREHSUL will be responsible for packing and exporting the melon production of members.

In the 1983-84 agricultural year, CREHSUL had 110 members who worked the land individually and 26 cooperatives working land collectively. These production cooperatives had a total of number of 316 members. The total area cultivated with melons was 840 ha. 50% of that area was financed directly by CREHSUL, and 50% was financed through loans obtained from BANADESA. While individual farmers associated with CREHSUL cultivated an average of 5.0 ha. with melons, collective farms cultivated 10 ha. It has been estimated that the average net profit obtained from the cultivation of melon is $750 per hectare. New management has been trying to increase these profits by directly exporting fruit that has not met PATSA's quality requirements. In 1984, this proved successful and it taught CREHSUL that quality requirements established by PATSA may be artificial. Recently, new management has been concerned about assuming control of the packing facility and is interested in training technical staff in the operation of the cooperative's plant. It is also interested in finding a new export broker that would allow the cooperative a low brokerage fee, more flexibility in the classification of fruit, and payment in dollars for fruit purchased. This latter objective is particularly important for the cooperative since currently access to foreign exchange to import agricultural inputs is based on proof of having previously brought dollars into the country.

It is estimated that the cultivation of melons requires a total of 150 man-days per hectare. Based on this figure we can say that the planting of 840 ha. with melon by CREHSUL members generated 126,000 man-days of employment from September 1983 to February 1984. In the 1983-84 cropping cycle, the operation of the packing facility generated an additional 11,000 man-days of labor.

3.3. Sun Fruits

Producers associated to the Sun Fruits cooperative cultivate cucumbers. Their experience is similar to that of CREHSUL farmers in that the zone where they cultivate is suitable for the production of vegetables, the planting of cucumbers is carried out during the slack period of their agricultural cycle, and the harvest takes place during a period when production may be marketed at good prices in the United States.

Cucumbers were introduced in the area on an experimental basis by United Brands in the 1976-77 period. Subsequent research on semi-commercial plantings and export trials were conducted by Standard Fruit Company (SFCo) from 1978 to 1980. After that date, a Comayagua Cucumber Export Project was supported by AID financing with both management and technical assistance also provided by SFCo. As of 1982, 5 production cooperatives and 5 individual farmers were participating in the project. They cultivated a total area of 38 ha. and were able to produce an average of 950 57-pound boxes of cucumber/ha. Farmers participating in this undertaking received loans from BANADESA and in-kind credit from local retailers of agricultural inputs. While SFCo was involved in project implementation, packing facilities were installed and adequate transportation and marketing channels established. Net profits to the farmer may be as high as $2.45 per box. With the yields indicated above, this represents as much as $2,327 in profits per hectare.

The participation of SFCo in the project was conceived as a temporary activity. To replace this company as project manager, responsible also for providing needed technical assistance, the creation of a service cooperative was envisioned. It was anticipated that this cooperative would fallow the same structure of that of CREHSUL. The cooperative, known as Sun Fruits, was in fact created at the beginning of 1983.

In the 1983-84 cycle, the cooperative had 115 members, 40 of whom were cucumber growers. 15 of the cucumber growers were independent farmers and 25 were land reform beneficiaries cultivating the land individually. Most of these farmers are small producers who generally grow both basic grains and vegetables. Among the individual farmers, however, there are some professionals who also carry on small scale farming to complement their income. During the last cropping season, cooperative members cultivated a total of 53 ha. with cucumbers and produced 79,500 boxes (55-pound). The operations ranged from 1 to 10 ha. All of the production was exported, thus showing the capacity of the management to efficiently coordinate the production and the shipping activities.

It has been estimated that during a normal crop cycle, the cultivation of cucumbers generates about 900 man-days of employment/ha. In the 1983-84 cucumber cultivation by Sun Fruits members generated approximately 37,367 man-days of agricultural labor

The cultivation of cucumbers has become attractive for many small farmers in the area where the cooperative is operating. MNR has traditionally conducted trials during the inter-cropping season on the farms of potential project participants. The criteria usually taken into account to become eligible for project participation include access to irrigation, soil quality and farm management. In 1983, only 9 of the 30 new farmers interested in cucumber cultivation met these criteria.

The cooperative will have to face important research questions particularly in relation to less expensive agricultural practices and crop diversification, for either crop rotation or for new exports. Questions of this sort would be ideal for the future Agricultural Research Foundation to address.

B. The Transfer of Technology: Notes on the Honduran Experience

1. The Process Observed and Intervening Variables

Recent analyses of programs implemented in Honduras to introduce technological innovations in agriculture have to confirm trends observed elsewhere. The literature dealing with this question generally presents two conclusions. One, technology transfer in agriculture is a process where certain stages can be detected. And second, the transition from one stage to the next is determined by inter-related variables which are different in nature. That is, where an initial openness toward technological innovations is present, acquaintance, trial and adoption of the technology may follow. In addition, individual, socio-economic and institutional variables may intervene in this process.

Small Honduran farmers who cultivate basic grains, given prevailing low yields and pressing socio-economic needs, have many times recognized the importance of new seed varieties and fertilizers, and in some cases even herbicides and insecticides. The expressed need for technical assistance among small basic grain growers interviewed through the ATAC survey mentioned earlier, for example, is an indication of the existence of a certain degree of openness toward technological innovations. The same interpretation is possible in the case of the findings presented by Kawas and Zuniga with respect to small coffee producers interviewed in Comayagua. In this case, farmers manifested a need for technical assistance in plant varieties, fertilization, pruning and shading. Small livestock raisers in the Comayagua Valley, producing essentially for the market and for profit, have also expressed great interest in technical innovation programs. Their interest lies in programs that would allow them to increase productivity in difficult periods when natural pasture is lacking. Experience shows, in fact, that technological openness increases with increments in the farmer's level of instruction, his status in the community and his integration to the market economy.

Interest in technological innovations is obviously necessary but not sufficient for innovations to take place. Acquaintance with the technology is the first step of the adoption process. Innovations must be presented to farmers and, most important, their advantages demonstrated. Change agents, however, need not to be concerned about the persuasiveness of their innovative messages in the case of certain agricultural practices and inputs which are already known in Honduras. This is true, for example, for plant spacing, seed varieties and fertilization in the case of basic grain growers. Hernandez Calderon (1981) studied the profitability of the use of inputs among such farmers in eight different geographical areas of the country. In four of the geographical areas considered, investment and operational profitability was higher among those using less or no inputs at all than among those showing some farm technification. That is, irrespective of the crop (e.g., corn, beans or rice), profits per (a) unit of variable cost and (b) unit of area cultivated may be higher among farms where technology is labor intensive than among those where inputs have been incorporated into the production process. For Hernández Calderon this is an indication of the fact that basic grain growers are acquainted with neither the appropriate inputs nor the adequate combination of inputs for the types of soils they cultivate. The suggestion is made that the the challenge for change agents in the case of basic grain growers is not to be persuasive but to be didactic. In this case, change agents must be able to educate farmers on how to adequately use known inputs and practices. Persuasiveness and demonstration of advantages of innovations will be most important, nevertheless, to induce transition from acquaintance to trial in the cases of entirely new or highly innovative technologies.

The transition from acquaintance to trial is not only dependent on the demonstrations made and on the degree of innovativeness of the technology presented. It also depends on its cost and the access farmers have to credit. A study performed by Suarez and Osorio (1980) on the variables influencing the adoption of technologies among coffee producers in the

northwest of Honduras demostrated the importance of credit. According to the major findings presented by these authors, farmers receiving no credit have not adopted any of the cultural practices studied. In addition, access to credit is more common among farmers classified as the most modern and it is less common among the least modern. An analysis of the adoption of technologies proposed through an agricultural research project in Olancho, based on the farm systems approach, also indicated that the adoption of fertilizers and herbicides was not as generalized as expected. This result was a consequence of the fact that farmers did not have the necessary resources to buy either the inputs recommended or the equipment needed to apply them. Similar conclusions were presented by an evaluation of the Rural Technologies Program implemented by the Mission. According to this evaluation, credit is necessary for the adoption of many of the materials, inputs and technologies proposed. The evaluators recommended adding an agricultural credit activity to the program if project objectives on technological adoption and farmer's income were to be accomplished.

Adequate use of technologies introduced depends on the type of institutional support provided to farmers. Both communication and learning theory teach us that message content should be designed to fit the characteristics of a particular audience, and that all behavior learned needs to be reinforced so that a certain level of performance is achieved and that extinction does not take place. Given the level of instruction of most Honduran farmers, it is important that technological innovations are introduced gradually so that the farmer does not feel overwhelmed by the new activities to be carried out. In addition, timely monitoring of activities is crucial to sustain correct application of technologies introduced.

Permanent adoption of technologies introduced, on the other hand, is a consequence of the profitability of the technologies proposed, and in many cases profitability is not associated with yields but with marketing channels. New plant densities and intercropping proposed through a CATIE-MNR project in three different ecological areas of Honduras were abandoned by many of the farmers participating in the project. According to Hernandez (1980), in most cases farmers went back to traditional methods of cultivation because of difficulties in selling either increased production or the new crops. Similar findings were presented in the evaluation of the Rural Technologies Program mentioned earlier. Technologies introduced through this program that were abandoned after two years of adoption were those associated with losses due to lack of markets. Waterwheels introduced in one particular area of the country were used for the irrigation of land cultivated during the dry season with vegetables such as peppers, tomatoes and onions. After the first year of installation of the waterwheels, prices for vegetables produced were high and the market was assured. The second year, however, the situation was totally the opposite. Farmers consequently abandoned the cultivation of vegetables, were not interested in other crops, and returned to traditional cultivation practices. After this experience, fields were not cultivated in the dry season again and waterwheels were no longer used.

The success of a technology transfer program in agriculture will depend on (a) the degree to which change agents can demonstrate the advantages of new technologies, (b) their capacity to train farmers on the proper use of technologies introduced, (c) their capacity to provide reinforcement for any learning that could have taken place, and (d) the access farmers have to credit and markets.

C. Implications of Target Group Characteristics for the Foundation

1. Potential direct project beneficiaries are different categories of producers: small, medium and large. Indirect beneficiaries are workers hired by farmers.

   If generation of employment is used as the criterion to establish future research priorities for the Foundation, the importance of traditional export crops such as bananas cannot be denied. As indicated earlier, banana cultivation generates approximately 230,000 man-months of employment per year. If the criterion utilized is, however, increased income for the majority of Honduran farmers, the importance of basic grains and exportable vegetables and fruits, particularly those having short growth cycles, must be emphasized.

   The cultivation of the latter crops is in the hands of both small and medium-sized individual farmers and land reform beneficiaries. Adequate technology and farming practices may double basic grain yields and allow farmers to use land more intensively. Crops such as melons and cucumbers, which may be planted over the same areas where basic grains were cultivated, may provide substantial income increments to producers, generating employment both for family members and hired labor. The net profits that can be made by cultivating one hectare of cucumbers, for example, are equivalent to almost twice as much the established poverty line income for a family of six. Profits of that sort may indeed bring people out of poverty.

   The non-traditional export crops presented in this analysis are suitable for certain ecological areas of the country. The cultivation of these crops takes place over flat land. One of the most important challenges for the future foundation will be to identify and test cropping systems and cultural practices that can allow a typical small Honduran producer, who is a hillside farmer, to use land intensively and to increase his income.

2. Given the variables that influence technological adoption in Honduras, another important challenge for the Foundation is the identification of the adequate channels through which the dissemination of findings can take place. The deficiencies of the national extension system are well known. Extensionists working for the national extension program are poorly motivated because of low salaries and job instability,

supervision of their field work is erratic, and their field visits are sporadic and untimely. Certain extension programs implemented by cooperatives and PVOs have tried to eliminate these difficulties, and despite the fact that modifications may still be needed, these programs have been more effective in transfering technological innovations to farmers than those implemented by development agencies within the public sector. The diffusion network to be set up by the Foundation should pay special attention to these other institutions for the diffusion of research findings.

3. Research findings must be made available not only through institutions that can effectively teach farmers the use of new technologies, but also through institutions that can offer farmers other services such as credit and the marketing of production. The experience of the CREHSUL and Sun Fruits cooperatives described earlier makes service cooperatives of this sort the ideal target institutions for any dissemination activities that the Foundation may eventually carry out. As indicated earlier the lack of credit may prevent farmers from adopting technological innovations proposed, and inadequate marketing channels may limit the earnings of producers or may force them to abandon the production of certain crops altogether.
It has been estimated that existing service cooperatives provide services to approximately 50,000 farmers. This represents about one fifth of the population of farmers in the country.

Bibliography

American Technical Assistance Corporation. Honduras. Pequenos Agricultores y Grupos de Reforma Agraria. Ano Agrícola 1975. Volumes I through V. Tegucigalpa, 1976.

Corporación Hondurena del Banano (COHBANA). Banano. Estadísticas de Producción por Productor y Zona de Producción. 1982. Tegucigalpa, 1983.

Desarrollo Internacional de Cooperativas Agrícolas. Estudio de Factibilidad Para la Organización de una Cooperativa Regional de Servicios Agrícolas en el Valle de Comyagua. Tegucigalpa, 1980

Dirección General de Censos y Estadísticas. Sumaria. Censo Nacional Agropecuario 1974. Tegucigalpa, 1979.

Hernández, Orlando. An Evaluation of Small Farmer Cropping Systems. USAID-Honduras, 1980.

Hernández, Orlando and Melba Zúniga. Social Analysis. Small Farmer Titling Project. USAID, 1983.

Hernández Calderón, Ilse. La Tecnología como parte Vital para el Desarrollo del Sector Agrícola. UNAH. Licenciatura Thesis in Economics. UNAH, 1981.

Instituto Hondureno del Café. Censo Cafetalero 1979-1980. Tegucigalpa: 1981.

Kawas, C. and Melba Zúniga. Estudio del Pequeno Caficultor: Departamento de Comayagua. IHCAFE, 1979.

Ministerio de Recursos Naturales. Presentación de Resultados del Enlace Tecnológico Durante 1982. Juticalpa, Olancho: 1983.

Ministerio de Recursos Naturales. Plan Operativo 1984-86. Programa Nacional de Granos Básicos. Tegucigalpa; 1983.

Slutzky, Daniel and Esther Alonso. Empresas Transnacionales y Agricultura: El Caso del Enclave Bananero en Honduras. Tegucigalpa: Editorial Universitaria, 1982.

Suarez, María del Carmen and F. Omar Osorio. Evaluación de Factores que Afectan la Adopción de Tecnología Cafetalera en la Zona Nor-Occidental de Honduras. IHCAFE, 1980.

ANNEX III G FINANCIAL ANALYSIS TABLE

PROJECT COSTS

	DESCRIPTION	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	TOTAL
I	Administrative Operating Costs	366	1,084	1,174	937	855	893	955	1,024	1,100	1,180	9,568
	A. Salaries, Benefits/Allow.	279	491	516	541	568	597	626	658	691	725	5,692
	B. Travel & Per Diem (including Board of Directors)	22	47	52	58	65	74	82	91	103	114	708
	C. Public Utilities	6	11	12	13	15	17	19	21	24	27	165
	D. Office Materials & Supplies	6	8	9	10	11	12	13	15	17	19	120
	E. Maintenance Building Service	12	13	15	17	19	21	24	27	30	34	212
	F. Serv.& Maint. for Vehicles	12	35	39	44	49	55	62	69	77	86	529
	G. Serv.& Maint. for Equip.	23	52	58	65	73	82	92	103	115	129	792
	H. Installation/Service of Telex		7	8	9	10	11	12	14	16	18	105
	I. Professional Services	5	20	21	22	23	24	25	26	27	28	221
	J. Technical Assistance		275	319	33	22						649
	K. Project Liaison Officer		125	125	125							375
II	Capital Investments	500	1,869		75		213	296	90	75		3,118
	A. Vehicles & Mainten.Equip.		140		75		45		90	75		425
	B. Office Equipment		65				18	47				130
	C. Radio Equipment		24					24				48
	D. Data Processing & Software		25					25				50
	E. Communication Equipment		130				150					280
	F. La Lima Facility Improvement											
	1. Building Improvement		100									100
	2. Central Experimental Farm		150									150
	3. Installations		85									85
	4. Irrigation System		50									50
	G. Ag.Equipment (tractors, etc.)		200									200
	H. Land	500	500									1,000
	I. Laboratory Equipment		400					200				600
III	Experimental Substations				144						30	(224)
	A. Substation No. 1				10							10
	1. Housing (substation chief)				4							4
	2. Warehouse (4x6 Aq. Mts.)				4							4
	3. Fences (20 x HA = 2 Kms.)				1							1
	4. Installations (elec., water)											
	5. Irrigation System											
	-water, wheel & pump				15							15
	-intake & distribution channels				40							40
	6. Agriculture Equipment				70						80	150
	B. Substation No. 2						144					(144)
	1. Housing (substation chief)						10					10
	2. Warehouse (4x6 Aq. Mts.)						4					4
	3. Fences (20 x HA = 2 Kms.)						4					4
	4. Installations (elec., water)						1					1
	5. Irrigation System											
	-water, wheel & pump						15					15
	-intake & distribution channels (10 HA at $4,000 each)						40					40
	6. Agriculture Equipment						70					70
IV	Research Programs											
	A. Non-Traditional Crops											
	1. Citrus	264	186	186	164	178	191	206	223	240	1,838	
	a. Salaries	79	83	87	91	97	101	106	111	117	872	
	b. Travel & Per Diem	10	11	13	14	15	16	17	19	21	136	
	c. Technical Assistance	132	44	33							209	
	d. Materials/Other Expenses	43	48	53	59	66	74	83	93	102	621	
	2. Cacao		282	195	177	189	237	219	236	253	1,788	
	a. Salaries		97	102	107	112	118	124	130	136	926	
	b. Travel & Per Diem		13	15	16	17	19	21	23	25	149	
	c. Technical Assistance		132	33			33				198	
	d. Materials/Other Expenses		40	45	54	60	67	74	83	92	515	
	3. Vegetables	244	255	268	216	230	245	261	280	299	2,293	
	a. Salaries	137	144	151	159	167	175	184	193	202	1,512	
	b. Travel & Per Diem	17	21	24	27	30	33	36	40	44	274	
	c. Technical Assistance	66	66	66							198	
	d. Materials & Other expenses	27	24	27	30	33	37	41	47	53	314	

	Traditional Export Crops				
	Coffee				
	Research Associate-Plant Pathologist	1	18,000	-	18,000	18,000
	Research Assistant-Plant Pathologist	1	7,000	-	7,000	7,000
	Sub-Total	2				25,000
	Pastures & Forages					
	Team Leader-Agronomist	1	27,000	2,700	29,700	29,700
	Research Associate-Animal Nutritionist	1	23,000	2,300	25,300	25,300
	Research Associate	1	9,000	900	9,900	9,900
	Laborers-Operations	2	2,150	215	2,365	4,730
	Sub-Total	5				69,630
	Experimental Farm					
	Superintendent-Agronomist	1	14,000	1,400	15,400	15,400
	General Foreman-Agronomist	1	6,000	600	6,600	6,600
	Mechanic-Services	1	6,500	650	7,150	7,150
	Maintenance Chief-Services	1	4,000	400	4,400	4,400
	Tractor Drivers-Operations	1	4,000	400	4,400	4,400
	Laborers-Operations	4	2,150	215	2,365	9,460
	Sub-Tota	9				47,410
V	Communication Development					
	Head of Department	1	40,000		40,000	80,000
	Librarian	1	20,000	3,667	23,667	23,667
	Evaluation Specialist	1	9,000	1,650	10,650	10,650
	Technical Liaison	1	9,000	900	750	10,650
	Research Information Service Office	1	7,200	1,320	8,520	8,520
	Audio Director Technician	1	7,200	1,320	8,520	8,520
	Artist	1	4,800	880	5,680	5,680
	Photographer	1	4,800	880	5,680	5,680
	Sub-Total	8				153,367
VI	Multidisciplinary Research Service					
	Pesticide Residue Technician	1	20,000	2,000	22,000	22,000
	Coordinator-Agr.Path.Chemister	1	42,000	42,000	84,000	84,000
	Research Assistant-Agr.Plant/Nutrit.	1	14,000	1,400	15,400	15,400
	Research Assistant-Agronomist Soils	1	14,000	1,400	15,400	15,400
	Research Assistant-Entomologist	1	14,000	1,400	15,400	15,400
	Laboratory Technician-Plant/Nutrit.	1	8,000	800	8,800	8,800
	Laboratory Technician Soils	1	8,000	800	8,800	8,800
	Laboratory Technician Pathologist	1	8,000	800	8,800	8,800
	Research Assistant Data Process Office	1	14,000	1,400	15,400	15,400
	Clerks	2	2,600	260	2,860	5,720
	Sub-Total	11				199,720
	GRAND TOTAL	134				1,660,027

BANANA & PLANTAIN PROGRAM COSTS

DESCRIPTION	NUMBER OF POSITIONS	YEAR SALARIES EACH POSITION	YEAR SALARIES TOTALS	BENEFITS	ALLOWANCE	TOTAL COSTS FOR 1985
Personnel & Salaries						
Farm Manager	1	31,200	31,200	3,120		34,320
Plant Breeders	2	48,000	96,000		96,000	192,000
Plant Pathologist	1	48,000	48,000		48,000	96,000
Agronomist Phisiologist	1	48,000	48,000		48,000	96,000
Research Assistant	1	48,000	48,000		48,000	96,000
Laborers	25	1,950	48,750	4,875		53,625
Foreman Tractor Driver	1	5,850	5,850	585		6,435
Warehouseman	1	3,250	3,250	325		3,575
Watchmen	2	2,600	5,200	520		5,720
Total Salaries			334,250	9,425	240,000	583,675
Travel & Per Diem						5,000
Materials & Other Expenses						54,000
Technical Assistance						30,000
Equipment						
1 Agriculture Tractor		60,000				
1 Bushmaster		12,000				
1 Mechanized Sprayer		15,000				
3 Pick-Ups 4x4 Type Vehicles		54,000				
2 Motor Bikes		2,600				
25 Packages of Agriculture Tools		6,250				
Total Equipment		149,850				149,850
Office Equipment & Furniture		2,600				2,600
Total Banana & Plantain Program						825,125

*Estimations of salaries for 1985/1993 are based on a 5% annual increase, and the other operating costs on a 12% annual increase, beginning with the base year 1985.

21 Capital Investments: Vehicles & Maintenance Equipment

DESCRIPTION	1985	1987	1989	1991	1992	TOTAL
A. Vehicles & Maintenance Equipment						
Vehicles Jeep Wagoneer Type for General Director and Communication Development Head Program	2) 30,000			2) 30,000		60,000
Pick-Up for Head of Research Programs	1) 15,000			1) 15,000		30,000
Pick-Up for Motor Pool Operation	5) 75,000	4) 60,000	3) 45,000	2) 30,000	5) 75,000	285,000
-Equipment for Vehicle Maintenance	20,000					20,000
-Spare Parts		15,000		15,000		30,000
Total Vehicles	140,000	75,000	45,000	90,000	75,000	425,000

282

II Capital Investments G: Agricultural Equipment

DESCRIPTION	1985 ACQUISITIONS	1987 ACQUISITIONS	1989 ACQUISITIONS
3 Tractors	70,000		
2 Sets of Agriculture Implements	63,000		
2 Water Sprinklers TDF	8,000		
3 Splatters Machines	11,000		
2 Steer Wagons	4,600		
2 Mowers, with Raker	6,000		
1 Forrage Packing Machine	9,500		
6 Motor Sprinklers	3,000		
3 Tractors Gravelly (hand-held type)	3,000		
Total	183,100		
Post Harvest Equipment	17,000		
	200,100		
III Experimental Substations			
Tractors		1) 22,000	1) 22,000
Sets of Agriculture Implements		1) 34,000	1) 34,000
Water Sprinklers TDF		1) 4,000	1) 4,000
Manual Water Sprinklers		2) 1,000	2) 1,000
Tractor Gravelly (hand held type)		1) 1,500	1) 1,500
Steer Wagons		1) 2,300	1) 2,300
Sets of Agriculture Tools		6) 1,500	6) 1,500
Post Harvest Equipment		3,700	13,700
		70,000	80,000

H. FOUNDATION LEGAL DOCUMENTS

SECRETARIA DE RECURSOS NATURALES

1 - MD / ~~Dan~~ 1C
2 - Ag
H 1

NOTA S-1465

Tegucigalpa,D.C., 25 de Junio de 1984

Señor
Anthony Cauterucci
Director AID/Honduras
Tegucigalpa,D.C.

Estimado Señor:

Adjunto a la presente para su información un ejemplar de los Estatutos de la Fundación Hondureña para la Investigación Agrícola (FHIA) que fueran aprobados en la Asamblea General de Constitución celebrada el 15 de mayo del año en curso, en el Salón de Asambleas del Hotel Copantl Sula, en su calidad de socio fundador de la misma.

Me es grato informarle que el Gobierno de la República de Honduras ha otorgado, mediante Resolución No. 85 del 4 de Junio de 1984, de la Secretaría de Estado en los Despachos de Gobernación y Justicia, la Personería Jurídica a esta nueva organización.

Lo anterior significa que la FHIA tiene ya capacidad civil y goza de los derechos para adquirir bienes, tomar y conservar la posesión de ellos, recibir usufructos, herencias, legados o donaciones, de la misma manera que podría hacerlo una persona natural.

Quiero informarle que próximamente le avisaremos sobre una nueva Asamblea, a fin de adoptar decisiones fundamentales para poner en marcha las actividades formales de la Fundación.

Sin otro particular me es grato suscribirme de usted.

Atentamente.

MIGUEL ANGEL BONILLA REYES
Ministro.

Oficinas Principales, Boulevard Miraflores, Tegucigalpa, D.C., Honduras, C.A.
Central telefónica: 32-6193, 32-6143, 32-6829, 32-6213, 32-6727, 32-7048, 32-7747
Telex SERENA, No. 8071 — Apartado Postal 804

CHAPTER I

NATURE, OBJECTIVES, DOMICILE AND DURATION

Article 1

The Honduran Foundation for Agricultural Research, hereinafter called the Foundation, is a civil, private, apolitical, non profit association, with its own legal standing, equity and form of government, established by national and foreign individuals from the private and public sectors, in a public document on the fifteenth day of May of the year one thousand nine hundred eighty-four, in accordance with the laws of the Republic of Honduras.

The Foundation is a Honduran institution which will complement governmental research, by concentrating on traditional and non-traditional crops for export. With regard to basic food crops, the Foundation will support government action in the generation and transfer of technology in this area. Toward this end, the Government of Honduras and the Foundation will carry out resolutions, agreements, and understandings in benefit of the producers of these crops. Likewise, the Foundation establishes as its right the freedom to carry out agreements and contracts with national and international private enterprises in support of basic food and other crops, as well as with the international and national organisms in the field of agriculture research.

The Foundation has its own legal standing and full legal capacity and consequently may, illustratively but without limiting itself, acquire, hold, possess, administer, dispose of, alienate, exchange and encumber goods of all types; carry out all types of acts and contracts; take upon itself credit operations; obligate itself; renounce and compromise goods and rights, as well as promote, oppose, carry on and desist from procedures deemed to be desirable and freely exercise all types of rights, actions, and exceptions, before the Courts and Tribunals of Justice, both ordinary and special, and entities of Public Administration and any others belonging to the State, Municipality and other corporations and agencies.

Article 2

The Foundation will be guided by the presents Bylaws and Internal Regulations, by resolutions and dispositions which in the future may be issued by the competent authorities, and additionally by the laws of the Republic.

Due to the private, autonomous and apolitical nature of the Foundation, it is expressly and formaly prohibited for any person or entity, by whatever title might be invoked, to attribute, usurp, assume, carry out and intervene in its functions or in the functions of its organisms in opposition to the provisions of these Bylaws and, in any case, said acts will be considered to be null and void, in application of existing Legislation.

Article 3

The Foundation will have the following objectives:

a) To operate the Center for Tropical Agricultural Research of Honduras with headquarters in La Lima, Department of Cortés, Honduras and its dependencies.

b) To carry out agricultural research in traditional and non-traditional areas for purposes of consumption and export, including aspects of production, processing and marketing at the national and regional levels in the cases thus established in the Internal Regulations of the Foundation, as provided in Article 34.

c) To provide analytical laboratory services and other services relating to research.

d) To maintain communication services in support of the services of agricultural extension and of the producer in general.

e) To generally encourage the agricultural development in the country, through the science and technology.

f) To operate international programs, especially when they relate to genetic resources of bananas, plantain and similar species and to obtain the financing for this.

Article 4

The Honduran Foundation for Agricultural Research will have its headquarters in the Center for Tropical Agricultural Research in Honduras located in La Lima, Cortés, and may establish branches and representative offices in other parts of the country or abroad as necesesary.

Article 5

The Foundation will be of indefinite duration and may only be dissolved in the fashion and for the causes contemplated in these Bylaws, and for those established by existing Legislation.

Article 6

The equity of the Foundation will be made up of grants, legacies, subsidies, accumulated own resources and their surpluses, as well as the product of the sale of its publications and other services which it might, on a non-profit basis, provide in the area on its field of action and objectives.

The equity, together with other resources, which in any fashion might be acquired by the Foundation, will serve as the basis for the implementation of its programs and will be administered through trusts and other legal financial mechanisms in the country and abroad.

The goods of any type which make up the equity of the Foundation will be able to be used only for the purposes and within the objectives and activities of the Foundation contemplated in these Bylaws.

The initial equity of the Foundation will be made up of the physical installations at the Center for Tropical Agricultural Research, in la Lima, Cortes, which include buildings, equipment, furniture and its experimental, farm all of which United Brands will donate to the Foundation. Also, the equity will include financial grants which the Agency for International Development (A.I.D.) will provide to the Foundation for its establishment and operations.

Article 7

The grants, legacies, subsidies and other similar contributions of equity carried out in the favor of the Foundation by any natural or legal person will not give to the donor any right with regard to the equity of the Foundation.

Excepted from the provisions of the preceding paragraph are any type of contribution related to a given resolution or agreement whose terms of reference have been especiifically approved by the General Assembly, although its efficacy is limited solely to the grant itself and to the said terms of reference.

Article 8

For the achievement of its objectives, the Foundation may:

a) Establish trust agreements.

b) Establish the legal financing mechanisms necessary in the country and abroad for the maintenance of its operations.

c) Negotiate agreements for technical-financial cooperation, with any natural or legal person having the same objectives, whether national or international, and in this later case, in accordance with the regulations put into effect for this purpose by the Foundation.

d) Obtain financial support from natural or legal persons, whether private or public.

e) Contract for services provided by and for the Foundation in the pursuit of its objectives.

f) Publish the results of its research and distribute said publications, including by sale thereof.

g) In general, carry out all the operations and legal acts necessary for the fulfillment of its mandate.

CHAPTER II

ON MEMBERS

Article 9

The Honduran Foundation for Agricultural Research will be integrated by, will admit and bestow the following categories of members: Founding, Active and Honorary.

a) Founding members are those natural persons who signed the Act of Proceedings of the Foundation for its creation. Such members will attend the first General Assembly of the Foundation, when legal recognition has been granted.

b) Active members are the natural or legal persons which may be incorporated into the Foundation, by means of the decision of the General Assembly and in accordance with the provisons of the Bylaws and Internal Regulations as provided in Article 34. When incorporating active members, the General Assembly will indicate in each case if the member representation is individual or institutional. In the case of institutional representation, the person who holds the higher position in the incorporated institution, or his delegate, will represent the membership.

c) Honorary members are those who, by their notable contributions to the achievement of the purposes of the Foundation, are worthy to be so distinguished.

When nominating new active members, a representation and a balance similar to those already existing among the founding members will be sought within the public institutions, private enterprises, producers associations, educational institutions, international organisms that encourage agricultural development and renown professionals.

Specifically, calling on the private and autonomous nature of the Foundation, it will be assured that the participation of organizations belonging to, or controlled by, public sector will not exceed its proportion of representation among the founding members.

Article 10

Active members will be no more than 30 in number and will maintain this condition for 6 years, except in the following stipulated parragraph:

Every two years, in the meeting of the Ordinary General Assembly; they will be elected by thirds, except what has been provided in Article 13. Outgoing active members may be reelected. The determination of the initial two thirds to be renewed will be made randomly. Once the first 6-year cycle of the Foundation ends, the provisions in the preceding paragraphs will apply. The outgoing active members will no participate in the deliberations and votes for the election of each third of members.

The General Assembly will have the authority to discharge any member for absence to the meetings or other action against the Foundation, in the fulfillment of Article 11.

Article 11

The rights and obligations of the members are:

a) To comply with the Bylaws and Internal Regulations as well as with the resolutions and agreements adopted by its competent organisms.

b) To attend personally the General Assemblies of the Foundation and to participate actively in them.

c) To accept and fulfill diligently the positions or commissions to which they are entrusted by the Foundation.

d) To elect and be elected as authorities of the Foundation.

e) To contribute in seeking financial resources in accordance to their possibilities.

CHAPTER III

ON THE ORGANISMS OF THE FOUNDATION

Article 12

The superior organisms of the Foundation are: The General Assembly, the Board of Directors, the Executive Management and the Vigilance Committee.

Article 13

The Presidency of the Foundation will fall to the person holding the title of Secretary of State in the Office of Natural Resources.

CHAPTER IV

ON THE GENERAL ASSEMBLY OF THE FOUNDATION

Article 14

The members will meet annualy, preferably within the first two months of the year in Ordinary General Assembly in the city of La Lima, Cortés. The convocation will be issued by the Board of Directors and will be made known at least one month ahead of time; said convocation will contain the agenda which the Assembly will be held. In the event that the Board of Directors deems necessary, it may issue convocations for Extraordinary General Assemblies at any time, specifying in the convocation its purpose and giving one month's advance notice.

The Assemblies will appoint a Secretary of the Assembly at the beginning of each period and the Executive Director will act as Secretary of Acts of same. The Ordinary and Extraordinary General Assemblies will be chaired by the President of the Foundation and preside by the President of the Board of Directors..

Article 15

All members have the right to attend Ordinary or Extraordinary General Assembly, but only active members will have the right to vote, excepting in the first General Assembly, where the founding members will vote.

In both the Ordinary as well as the Extraordinary General Assemblies a quorum will be considered to exist when two thirds of the active members are present and the resolutions will be taken by a simple majority vote.

If a majority, as established in the preceding paragraph, cannot be met, a second convocation will be made, expressly advising that the meeting will take place with the number of members attending.

The notice, by means of which the General Assembly is convoked, may anticipate a second convocation, per the provisions of this article, within the hour following that originally contemplated for the first convocation.

Article 16

The attributions of the General Assembly are as follows:

a) To discuss, modify and approve the annual work plan presented by the Board of Directors.

b) To discuss, modify and approve the annual report work plan and budget to be presented by the Executive Management through the Board of Directors.

c) To discuss and approve the financial balance sheet and the reports presented by the Board of Directors, Vigilance Committee and Executive Management.

d) To discuss, modify and approve the proposals submitted by the Board of Directors.

e) To interpret these Bylaws and Regulations.

f) To establish the general policy of the Foundation.

g) To elect the members of the Board of Directors and Vigilance Committee.

h) To appoint the Executive Director of the Foundation.

i) To elect the active and honorary members, according to the provisions of Chapter II of these Bylaws.

j) To decide upon the dissolution of the Foundation, as provided in Article 32 of the Bylaws.

k) To approve and modify, as necessary, the Internal Regulations, as provided for in Article 34 of these Bylaws.

CHAPTER V

ON THE BOARD OF DIRECTORS OF THE FOUNDATION

Article 17

The Board of Directors will be made up of the active members of the Foundation designated for this purpose by the General Assembly and in accordance with the procedures established in these Bylaws. When designating members of the Board of Directors, the General Assembly will ensure to the degree feasible that the various interests represented in the Assembly are also represented on the Board, in the same proportion as their presence in the Assembly.

Article 18

The Board of Directors will be made up of a President, a Vice-President and five other members elected by the General Assembly. The Executive Director of the Foundation will act as Permanent Secretary of the Board of Directors, with a voice but without the right to vote.

The members of the Board of Directors will be elected bearing in mind the private and autonomous nature of the Foundation, reflecting in its composition the various representations and components of the General Assembly, and in this regard the participation in the Board by the Government will be granted to only one of the members of said Board of Directors.

The members of the Board of Directors will be elected by the General Assembly for a period of two years, with the possibility of reelection.

Article 19

The Board of Directors will have the following general attributes and obligations:

a) To watch over and support the faithful compliance of the Bylaws, Internal Regulations and policies of the Foundation.

b) To acquire rights and contract obligations.

c) Others assigned by the Bylaws and by the Assembly.

The positions of the Board of Directors, the Vigilance Committee and those that the members themselves might carry out in the General Assembly, will be honorary and gratuitous, and consequently will give no cause for remuneration or honoraria of any type and will be not subjected to civil responsibility in any case.

The Internal Regulations may specify the reimbursable expenses in which the Board of Directors incur.

Article 20

The functions of the Board of Directors are:

a) To approve, as necessary, modifications to the Annual Work Plan and Budget as proposed by the Executive Director of the Foundation. Said modifications may not, however, by their nature, suppose a substantial variation thereof. As a general rule, a substantial variation shall be understood to be one which represents more than twenty percent of the Annual Work Plan and/or Budget of the line items agreed by the General Assembly.

b) To be informed of problems of implementation and to make recommendations in this regard to the Executive Director.

c) To be adequately informed of the operating plans and budgets approved by the General Assembly and to provide follow-up over time.

d) To offer effective support to the Executive Management in those problems or matters submitted thereby.

e) To apply these Bylaws and Regulations of the Foundation.

f) To legally represent the Foundation and delegate the authority to grant powers to whom it may concern, especially to the Executive Director, according to Article 25.

g) To authorize external evaluations of the Programs, when it is deemed necessary.

Article 21

In order to carry out the ordinary and extraordinary meetings of the Board of Directors, the presence of at least five of its members will be required and the resolutions will be taken by majority vote, but in no case with less than four favorable votes.

CHAPTER VI

ON THE VIGILANCE COMMITTEE

Article 22

The Vigilance Committee is an organism of the Foundation which shall enjoy sufficient independence in order to be able to control all of the operations of the Foundation. For this purpose, it will receive the necessary support from the funds of the Foundation. It will be made up of three active members duly named and elected by the General Assembly, and these positions will be incompatible with that of member of the Board of Directors and that of Executive Director. Their functioning will be established in accordance with the Internal Regulations, as per the provisions of Article 34 of these Bylaws.

Their functions will be as follows:

a) To watch over the normal functioning of the Foundation, and especially the private, autonomous and apolitical nature of the Foundation.

b) To contract for and supervise the periodic audits contemplated in Article 29 of these Bylaws and those other audits deemed necessary.

c) To make arrangements for the taking of annual and other inventories considered necessary for the carrying out of its objectives.

d) To watch over the strict observance of the norms and procedures established in these Bylaws and in the Internal Regulations.

e) To ensure that all activities of the Foundation, and especially the activities related to scientific and technical research, are in conformance with professional ethics.

f) The Vigilance Committee will meet seminannually at the Foundation quarters and when circumstances so require, upon convocation by the member acting as President of the Foundation.

CHAPTER VII

ON THE EXECUTIVE MANAGEMENT

Article 23

The Executive Director of the Foundation will be the main administrative and scientific officer thereof and will be responsible for its operation before the Board of Directors of the Foundation.

Article 24

The Executive Director will ensure the efficient functioning of the organization and the compliance with the Annual Work Plans and Budgets approved by the General Assembly and the resolutions of the Board of Directors, being charged in addition with the responsibility for their implementation.

Article 25

The Executive Director will legally represent the Foundation in judicial and extra-judicial proceedings and before organisms with which the Foundation must deal, inside or outside the country, granting for this purpose the powers deemed necessary through the delegation of the Board of Directors.

Article 26

The general responsibilities of the Executive Director include:

a) To propose the Annual Operating and Financial Plan at the corresponding time before the Board of Directors for their analysis and subsequent approval in the General Assembly.

b) To ensure the efficient implementation of the Operating and Financial Plans approved by the General Assembly.

c) To watch over the goods and resources of the institution, and to pursue their adequate maintenance and functioning for their given purposes.

d) To seek opportunities to obtain resources which would increase the goods and enhance the possibilities of the organization.

e) To place at the disposal of the Vigilance Committee the means required thereby for the total fulfillment ot its functions.

f) To recur to the Board of Directors for the resolution of the issues and questions beyond its scope of competence.

g) To convoke and propose the Agenda for the ordinary and extraordinary meetings of the Board of Directors in accordance with its President.

h) To prepare and present the Annual Report of activities and the Financial Report before the Administrative Council, and upon approval present it to the General Assembly for their information.

i) To appoint the Deputy Executive Director and high officers of the Foundation, and to submit their names before the Administrative Council for their approval.

j) To convoke the internal annual technical review of the research programs of the Foundation, including progress, achievements and future plans. Said meetings, should take place before preparing the Annual Report, in order to help its preparation.

Article 27

The Executive Director will designate the corresponding Technical Committees for the programs of the Foundation, whose functions will be:

a) To provide orientation for the technical aspects of the programs in order that they might respond to the best interests of the beneficiaries.

b) To promote linkages between programs of the Foundations, and other entities and beneficiaries.

c) To suggest research opportunities for consideration in the programs of the Foundation.

CHAPTER VIII

ECONOMIC PERIODS AND GENERAL BALANCE SHEET

Article 28

The economic periods of the Foundation will begin on the first day of January and will end on the thirty-first day of the month of December of each year. Annually, a balance sheet will be prepared and a statement of income and expense will be drawn up for the fiscal year, which will be presented to the General Assembly through the Board of Directors.

In all budgets and balance sheets of the Foundation, the amounts corresponding to expenses for the current administration and the expenses for the implementation of the corresponding programs will be clearly and expressly indicated.

Article 29

A review of operations will be carried out annualy by an external auditor in conformance with the provisions of Article 22, paragraph b) of these Bylaws and in the Internal Regulations of the Foundation.

CHAPTER IX

GENERAL PROVISIONS

Article 30

The resolutions of the Board of Directors and the Vigilance Committee will take effect immediately, but must be ratified by the General Assembly.

Article 31

The Foundation will be dissolved:

a) By the votes of two thirds of the active members of the Foundation, in Extraordinary General Assembly, convoked especially for this purpose.

b) For any other legal established causes.

Article 32

In the event of the dissolution of the Foundation, the Extraordinary General Assembly shall determine the form in which it will be liquidated and its final disposition. In any case, after the obligations have been liquidated, the assets must be destined for non-profit institutions with objectives similar to those of the Foundation.

Article 33

The reform of the present Bylaws must be agreed to in Extraordinary General Assembly, convoked for this purpose and with the favorable vote of two thirds of the active members of the Foundation.

Article 34

The General Assembly will approve, by simple majority, an Internal Regulation for purposes deemed appropriate.

Any reform or modification of said Internal Regulations must comply with the formal requirements and voting requirements established in the preceding paragraph of this Article.

CHAPTER X

TRANSITORY PROVISIONS

Article 35

For a period of four years, that is to say, for two consecutive mandates, the position of President of the Board of Directors shall be carried out by the Secretary of State in the Office of Natural Resources. Once said initial period has expired, the provisions of Chapter V, Article 18 of the Bylaws of the Foundation will prevail. In any event, the Secretary of State in the Office of Natural Resources will be a permanent member of the Board of Directors.

In witness whereof we sign these Bylaws on the fifteenth day of May of the year one thousand nine hundred eighty-four.

298

SECRETARIA DE ESTADO EN LOS DESPACHOS DE GOBERNACION Y JUSTICIA

EXPEDIENTE No. .....

RESOLUCION No. 85.

PERSONALIDAD JURIDICA

"FUNDACION HONDUREÑA DE INVESTIGACION AGRICOLA"

Representante Legal: LIC. JOSE RAMON PAZ.

Tegucigalpa,D.C., 7 junio 1984.

299

PRIMERA CLASE
CINCUENTA CENTAVOS
1984 - 1987

Nº 0395579

CERTIFICACION

El Infrascrito Secretario de Estado en los Despachos de Gobernación y Justicia, CERTIFICA la Resolución que dice:

RESOLUCION No. 85.-EL PRESIDENTE CONSTITUCIONAL DE LA REPUBLICA.-Tegucigalpa, Distrito Central, cuatro de junio de mil novecientos ochenta y cuatro.VISTA para resolver, la solicitud presentada al Poder Ejecutivo por medio de la Secretaría de Estado en los DEspachos de Gobernación y Justicia, con fecha treinta y uno de mayo del presente año, por el señor JOSE RAMON PAZ, mayor de edad, casado, Abogado y de este domicilio, actuando en su condición de Apoderado Legal de la FUNDACION HONDUREÑA DE INVESTIGACION AGRICOLA": contraída a pedir que se reconozca a su representada como Persona Jurídica y se aprueben sus Estatutos.RESULTA: Que el peticionario acompañó a su solicitud los documentos que exige la Ley.RESULTA: Que a la solicitud se le dió el trámite de ley correspondiente, habiéndose mandado oir al Señor Procurador General de la República, quien al devolver el traslado emitió informe favorable. CONSIDERANDO: Que los Estatutos de la Fundación Hondureña de Investigación Agrícola, no contrarían las leyes del país, el orden público, la moral y las buenas costumbres, es procedente acceder a lo solicitado. POR TANTO: EL PRESIDENTE CONSTITUCIONAL DE LA REPUBLICA.RESUELVE:RECONOCER como Persona Jurídica a la Fundación Hondureña de Investigación Agrícola, y aprobar sus Estatutos en la forma siguiente:"ESTATUTOS DE LA FUNDACION HONDUREÑA DE INVESTIGACION AGRICOLA". CAPITULO I. NATURALEZA, OBJETIVOS,DOMICILIO Y DURACION. Art.1. La Fundación Hondureña para la Investigación AGrícola, en adelante llamada la Fundación, es una asociación civil, privada, apolítica, sin fines de lucro, con personalidad jurídica, patrimonio y gobierno propios, constituída por personas nacionales y extranjeras, del sector privado y público, en acta del día

300

quince de mayor de mil novecientos ochenta y cuatro, de conformidad con las leyes de la República de Honduras. La Fundación es una institución hondureña para la investigación agrícola que ejercerá función principalmente en los cultivos tradicionales y no tradicionales de exportación. En cuanto a los cultivos alimenticios básico, la Fundación apoyará la acción gubernamental en la generación y transferencia tecnológica en esta área. Para este fin, el gobierno de Honduras y la Fundación concertarán acuerdos, convenios y entendimientos en beneficio de los productores de estos cultivos. Asimismo, la Fundación tiene el derecho de concertar acuerdos y contratos con la empresa privada nacional e internacional en apoyo de los cultivos básicos alimenticios y demás cultivos, así como con los organismos internacionales y nacionales en el ámbito de la investigación agrícola. La Fundación tiene personalidad jurídica propia y plena capacidad jurídica, y por tanto, con carácter enunciativo y no limitativo, puede adquirir, conservar, poseer, administrar, disponer, enajenar, permutar y gravar bienes de todas clases; celebrar todo género de actos y contratos; concertar operaciones crediticias; obligarse, renunciar y transigir bienes y derechos; así como promover, oponerse, seguir y desistir los procedimientos que fueren oportunos y ejercitar libremente toda clase de Justicia, ordinarias y especiales; y orgnaismos de la Administración Pública y cualesquiera otros del Estado, Municipio y demás Corporaciones y entidades. Art.2. La Fundación se regirá por los presentes Estatutos y Reglamento Interno, resoluciones y disposiciones que en el futuro emanen de sus autoridades competentes y supletoraimente por las leyes de la República. Por el carácter privado, autónomo y apolítico de la Fundación, expresamente y formalmente se prohibe que persona u organismos alguno, cualquiera que fuere el título que invocare, se atribuya, arrogue, asuma, desempeñe e intervenga en funciones

PRIMERA CLASE
CINCUENTA CENTAVOS
1984 - 1987

Nº 0395579

de la misma o de sus órganos en contra de lo previsto en los presentes Estatutos, y, en todo caso, dichos actos se considerarán nulos e ineficaces, en aplicación de la Legislación vigente aplicable. Art.3. La Fundación tendrá los objetivos siguientes: a) Operar el Centro de Investigaciones Agrícolas Tropicales de Honduras con sede en La Lima, Departamento de Cortés, Honduras y sus dependencias. b) Realizar investigaciones agrícolas en rubros tradicionales y no tradicionales para fines de consumo y exportación, incluyendo aspectos de producción, procesamiento y comercialización a nivel nacional e internacional en los casos así establecido en el Reglamento Interno de la Fundación, según lo previsto en el Artículo 34. c) Proveer servicios analíticos de laboratorio y otros servicios afines a la investigación. d) Mantener servicios de comunicación en apoyo de los servicios de extensión agrícola y del productor en general. e) Estimular el desarrollo agrícola en el país, en forma general a través de la ciencia y tecnología. f) Operar programas de índole internacional especialmente cuando hagan referencia a recursos genéticos del banano, plátano y especies afines y a la obtención de financiamiento para tal fin. Art.4. La Fundación Hondureña para la Investigación Agrícola tendrá su domicilio en el Centro de Investigaciones Agrícolas Tropicales de Honduras con sede en La Lima, Cortés, pudiendo establecer dependencias y representaciones en otras partes del país o en el exterior según sea necesario. Art.5. La Fundación tendrá duración indefinida y solamente podrá disolverse en la forma y por las causas contempladas en los presentes Estatutos, y las que la Legislación vigente aplicable establezca. Art.6. El patrimonio de la Fundación estará compuesto por las donaciones, legados, subsidios, recursos propios acumulados y sus plusvalías, así como el resultado de la venta de sus publicaciones y otros servicios que, sin ánimo de lucro, pudiera prestar en el ámbito de su campo de acción y objetivos.-

302

El Patrimonio unido a otros recursos que a cualquier título adquiera la Fundación, servirá de base para la ejecución de sus programas y podrán ser administradas a través de Fideicomisos y otros mecanismos financieros legales en el país y en el exterior. Los bienes de cualquier tipo que compongan el patrimonio de la Fundación únicamente podrán utilizarse para los fines y dentro de los objetivos y actividades de la misma previstos en los presentes Estatutos. El patrimonio inicial de la Fundación lo constituirá las instalaciones físicas existentes del Centro de investigaciones Agrícolas Tropicales, La Lima, Cortés, incluyendo edificios, equipo, mobiliario y la finca experimental del mismo; que la United Brand cederá a título gratuito a la Fundación. También, constituirá parte del patrimonio inicial donacionaciones financieras que la Agencia para el desarrollo Internacional (A. I. D.), concederá a la Fundación para su establecimiento y operación. Art.7. Las donaciones, legados, subvenciones u otras aportaciones de patrimonios similares realizadas a la Fundación por cualquier persona natural o jurídica no darán al donante ningún derecho sobre el patrimonio de la Fundación. Se exceptúan de lo previsto en el párrafo anterior, cualquier tipo de aportaciones vinculada a un acuerdo o convenio determinado cuyos términos de referencia hayan sido específicamente aprobados por el Consejo de Administración, aunque su eficacia se limita únicamente a la propia donación y a los citados términos de referencia. Art.8. Para el logro de sus objetivos, la Fundación podrá: a) Establecer acuerdos de fideicomisos. b) Establecer los mecanismos financieros legales necesarios en el país y el exterior para sostenimiento de sus operaciones. c) Negociar acuerdos de cooperación técnico-financiera, con cualquier persona natural o jurídica, que conlleve a los mismos objetivos ya sea nacional o internacional, en este último caso de acuerdo a lo reglamentado al efecto por la Fundación. d) Procurar apoyo financie-

PRIMERA CLASE
CINCUENTA CENTAVOS
1984 - 1987

Nº 0395576

ro de personas naturales o jurídica de carácter privado o público. e) Realizar contrataciones por servicios prestados por y para la Fundación en la consecución de sus objetivos. f) Publicar el resultado de sus investigaciones y difundir dichas publicaciones, incluso mediante su venta. g) En general, realizar todas las operaciones y actos legales necesarios para el cumplimiento de su cometido. CAPÍTULO II. DE LOS SOCIOS. Art. 9. La Fundación Hondureña para la Investigación Agrícola, estará integrada, reconocerá y otorgará las siguientes calidades de socios: Fundadores, Activos y, Honorarios. a) Son socios Fundadores las personas naturales que suscribieron el Acta Constitutiva de la Fundación, Dichos socios asistirán a la primera Asamblea General de la Fundación después que ésta haya recibidos su personería jurídica. b) Socios Activos las personas naturales o Jurídicas que sean incorporados a la Fundación por decisión de la Asamblea General y según las disposiciones de los Estatutos y el Reglamento Interno, según lo previsto en el Artículo 34. Al incorporar socios Activos, la Asamblea General indicará en cada caso si la representación del socio sea individual o institucional. En el caso de ser representación institucional, la persona que ocupe la posición más alta en la institución incorporada o su delegado, representará al socio. c) Son Socios Honorarios, los que por su notable contribución al logro de los fines de la fundación se hacen acreedores a ser calificados con esa distinción. En el nombramiento de nuevos Socios Activos, se buscará mantener en forma similar a lo que existe entre los fundadores, la representación de, y el balance entre, las instituciones públicas, las empresas privadas, asociaciones de productores, instituciones educacionales, organismos internacionales que fomenta el desarrollo agrícola y profesionales distinguidos. Específicamente, atendiendo el carácter privado y autónomo de la Fundación, se asegurará que la participación de organizaciones del, o con-

304

trolado por el sector público, no sea superior a su representación proporcional entre los fundadores. Art.10. Los Socios Activos no superará el número de 30, y conservará esa calidad por el término de 6 años, excepto lo previsto en el siguiente párrafo. Cada dos años en el seno de la Asamblea General Ordinaria serán elegidos por tercios exceptuando lo previsto en el Artículo 13. Los socios Activos salientes podrán ser reelegidos. La determinación de los dos primeros tercios a renovar se hará por sorteo. Una vez concluído el primer ciclo de 6 años de la Fundación, se estará a lo previsto en los párrafos anteriores. En las deliberaciones y votaciones para la elección de cada tercio de socios no participarán los socios activos salientes. La Asamblea General tendrá también autoridad para excluir cualquier socio que por falta de asistencia a sesiones o cualquier otra acción contraríe a la Fundación en el cumplimiento del ARtículo 11. Art.11. Son derechos y obligaciones de los socios: a) Cumplir los Estatutos y Reglamento Interno, lo mismo que las resoluciones y acuerdos que se adopten por sus órganos competentes. b) Asistir personalmente a las Asambleas Generales de la Fundación y participar activamente en las mismas. c) Aceptar y cumplir con diligencia los cargos o comisiones que les fueren encomendados por la Fundación. d) Elegir y ser elegidos como autoridades de la Fundación. e) Colaborar en la capacitación de financiamiento en la medida de sus posibilidades. CAPITULO XII. DE LOS ORGANOS DE LA FUNDACION. Art.12. Los órganos superiores de la Fundación son: La Asamblea General, El Consejo de Administración, La Dirección Ejecutiva y El Comité de Vigilancia. Art.13. La Presidencia de la Fundación recaerá en el titular de la Secretaría de Estado en el Despacho de Recursos Naturales. CAPITULO IV. DE LA ASAMBLEA GENERAL. Art.14. Los socios se reunirán anualmente, preferiblemente dentro de los primeros dos meses del año en Asamblea General Ordinaria en la ciudad de La Li-

305

PRIMERA CLASE
CINCUENTA CENTAVOS
1984 - 1987

Nº 0395576

ma, Cortés. La convocatoria será suscrita porel Consejo de Administración, será dada a conocer al menos con un mes de anticipación y contendrá la agenda que regirá la Asamblea. En caso de que el Consejo de Administración lo estime necesario, podrá convocarse a Asambleas Generales Extraordinarias en cualquier tiempo, especificamente en la convocatoria el objeto de la misma y dándole a conocer con un mes de anticipación. Las Asambleas nombrarán en su seno un Secretario de la = Asamblea al inicio de cada ejercicio y el Director Ejecutivo actuará como Secretario de Actas de la misma. Las Asambleas Generales Ordinarias y Extraordinarias serán inauguradas por el Presidente de la Fundación y presididas por el Presidente del Consejo de Administración. Art.15. Todos los socios tienen derecho a asistir a la Asamblea General Ordinaria o Extraordinaria, pero tendrán derecho a voto únicamente los socios activos, con la excepción de la primera Asamblea General, cuando los socios fundadores ejercerán el voto. Tanto en Asambleas Generales Ordinarias como Extraordinarias se considerará que hay quórum cuando estén presentes las dos terceras partes de los socios activos y las resoluciones se tomarán por mayoría de los votos presntes. De no reunirse la mayoría establecida en el párrafo anterior se hará una segunda convocatoria, advirtiendo expresamente que la reunión se efectuará con el número de socios que asista. La comunicación por la que se convoque a la Asamblea General podrá prever una segunda convocatoria, según lo previsto en el presente artículo, dentro de la hora siguiente a la originalmente prevista para la primera. Art.16. Son atribuciones de la asamblea general: a) Discutir, modificar y aprobar el informe anual del Consejo de Administración. b) Discutir, modificar y aprobar el plan anual de trabajo y presupuesto que presente la Dirección Ejecutiva a través del Consejo de Administración. c) Discutir y aprobar el balance financiero y los informes que le presente el Consejo

306

sejo de Administración, Comité de Vigilancia y la Dirección Ejecutiva.d) Discutir y modificar y aprobar las propuestas del Consejo de Administración, que éste le plantee. e) Interpretar los Estatutos y el Reglamento Interno.f) Fijar la política general de la Fundación.g) Elegir en su seno a los componentes del Consejo de Administración y el Comité de Vigilancia. h) Nombrar el Director Ejecutivo de la Fundación. i) Elegir a los socios activos y honorarios, según lo previsto en el Capítulo II de los presentes Estatutos. j) Decidir sobre la disolución de la Fundación, según lo previsto en el Artículo 32 de estos Estatutos. k) Aprobar y modificar, en su caso, el Reglamento Interno, según lo previsto en el Artículo 34 de los presentes Estatutos. CAPITULO V. DEL CONSEJO DE ADMINISTRACION. Art. 17. El Consejo de Administración estará integrado por los socios activos de la Fundación designados al efecto por la Asamblea General y de acuerdo a los procedimientos establecidos en los presentes Estatutos. Al designar miembros del Consejo de Administración, la Asamblea General deberá asegurar que los diversos intereses representados en la Asamblea también sean representados en el Consejo, en la misma proporción que su presencia en la Asamblea, hasta donde sea factible.- Art. 18. El Consejo de Administración estará constituído por: Un Presidente, Vicepresidente y Cinco Vocales elegidos por la Asamblea General en su seno. El Director de la Fundación actuará como Secretario Permanente del Consejo de Administración, con voz y voto sin derecho a voto. Los integrantes del Consejo de Administración serán elegidos atendiendo al carácter privado y autónomo de la Fundación, reflejando en su composición la de las diversas representaciones y componentes de la Asamblea General, y en tal sentido la participación del mismo Gobierno se confiará a uno solo de los integrantes de dicho Consejo de Administración. Los miembros del Consejo de Administración serán electos por la Asamblea General para un

307

PRIMERA CLASE
CINCUENTA CENTAVOS
1984 - 1987

Nº 0395575

período de dos años, con posibilidad de reelección. Art.19. El Consejo de Administración tendrá las siguientes atribuciones generales y deberes: a)Vigilar y apoyar el fiel cumplimiento de los Estatutos, Reglamento Interno y políticas de la Fundación.b)Adquirir derechos y contraer obligaciones.c)Las demás que le asignen los Estatutos y la Asamblea. Los cargos del Consejo de Administración, Comité de Vigilancia y los que los propios socios pudieran desempeñar en el seno de la Asamblea General serán honorarios y gratuitos y por lo tanto no darán ocasión a remuneración y honorario de tipo alguno no serán objeto de responsabilidad civil en ningún caso. En el Reglamento Interno podrá asignarse los gastos reembolsables en que incurra en su caso.Art.20. Las reuniones del Consejo de Administración son: a)Aprobar, en su caso, modificaciones al Plan Anual Operativo y Presupuesto a propuesta del Director Ejecutivo de la Fundación.Dichas modificaciones no podrán sin embargo, por su naturaleza, suponer una variación substancial a los mismos, como regla general, se entenderá como variación substancial aquella que represente más del veinte por ciento del Plan Anual Operativo y/o Presupuesto, de las partidas presupuestarias acordadas por la Asamblea General.b)Conocer de problemas de ejecución y hacer recomendaciones al Director Ejecutivo al respecto.c) Conocer adecuadamente los planes operativos y presupuestos aprobados por la Asamblea General y darle seguimiento en el tiempo.d)Brindar apoyo efectivo a la Dirección Ejecutiva en aquellos problemas o cuestiones planteadas por la misma.e)Aplicar los presentes Estatutos y Reglamentos de la Fundación.f)Ostentar la representación legal de la Fundación y delegar facultades para otorgar poderes a quien corresponda, especialmente al Director Ejecutivo y según el Artículo 25. g)Autorizar evaluaciones externas de los Programas cuando se considere oportuno. Art. 21. Para la celebración de las sesiones ordinarias y extraordinarias del Consejo de

Administración, se requerirá la presencia de por lo menos de cinco de sus miembros y las resoluciones se tomarán por mayoría, pero en ningún caso con menos de cuatro votos favorables. CAPITULO VI. DEL COMITE DE VIGILANCIA. Art.22. El Comité de Vigilancia es el órgano de la Fundación que gozará de plena independencia para poder vigilar todas las operaciones de la misma. Para este propósito recibirá el apoyo necesario de los fondos de la Fundación. Estará compuesto por tres socios activos elegidos por la Asamblea General en su seno, siendo dichos cargos incompatibles con el de miembro del Consejo de Administración y el de Director Ejecutivo. Su funcionamiento se establecerá en lo previsto en el Reglamento Interno, según lo dispone el Artículo 34 de los presentes Estatutos. Sus funciones serán las siguientes: a) Vigilar por el normal funcionamiento de la Fundación, y en especial el carácter privado, autónomo y apolítico de la Fundación. b) Encargar y supervisar las auditorías periódicas previstas en el Artículo 29 de los presentes Estatutos y aquellas que considere oportunas. c) Disponer que se realicen los inventarios anuales y otros que considere necesarios para el buen fin de sus objetivos. d) Vigilar la observancia estricta de las normas y procedimientos establecidos en los presentes Estatutos y el Reglamento Interno. e) Velar porque todas las actividades de la Fundación, y en general la relativa a la investigación científica y técnica, sean conformes a la ética profesional. f) El Comité de Vigilancia se reunirá semestralmente en el Domicilio de la Fundación y cuando las circunstancias lo requieran y convocado por el miembro que actúe como Presidente del mismo. CAPITULO VII. DE LA DIRECCION EJECUTIVA. Art.23. El Director Ejecutivo será el principal funcionario administrativo y científico de la Fundación y será responsable de su gestión ante el Consejo de Administración de la Fundación. Art. 24. El Director Ejecutivo velará por la eficiente labor de la organización y por

309

PRIMERA CLASE
CINCUENTA CENTAVOS
1984 - 1987

Nº 0395575

el cumplimiento de los Planes Anuales de Trabajo y Presupuestos aprobados por la Asamblea General y las resoluciones del Consejo de Administración, teniendo a su cargo la ejecución de los mismos. Art.25. El Director Ejecutivo representará legalmente a la Fundación en actos judiciales y extrajudiciales y ante organismos con los que debe tratar la Fundación como tal, dentro o fuera del país, otorgando para tal efecto poderes que fueren necesarios mediante la oportuna delegación delegación del Consejo de Administrativo. Art.26. Las responsabilidades generales del Director Ejecutivo incluye: a) Proponer el Plan Operativo Anual y Financiero en su tiempo determinado ante el Consejo de Administración para su análisis y posterior aprobación en Asamblea General. b) Asegurar la ejecución eficiente de los Planes Operativos y Financieros aprobados por la Asamblea General. c) Velar por los bienes y recursos de la institución procurando su mantenimiento y funcionamiento adecuado para los fines dados. d) Biscar oportunidades para obtener recursos que incrementen los bienes bienes y posibildiades de la organización. e) Poner a disposición del Comité de Vigilancia los medios que éste precise para el pleno cumplimiento de sus funciones. f) Recurrir al Consejo de Administración para las resoluciones de las materias y cuestiones para las que carezca de competencia. g) Convocar y proponer la AGenda para las reuniones ordinarias y extraordinarias del Consejo de Administración de acuerdo con su Presidente. h) Preparar y presentar el Informe Anual de actividades y el Informe Financiero al Consejo de Administración y tras aprobación de éste a la Asamblea General para su conocimiento. i) Nombrar el Sub-Director Ejecutivo y los altos funcionarios de la Fundación y someterlos a la ratificación del Consejo de Administración. J) Convocar la reunión interna de revisión técnica anual de los programas de investigación de la fundación, incluyendo avances, logros y planes futuros. Dichas reuniones se llevarán

310

a cabo previamente a la preparación del informe anual y servirán de base para éste. Art.27. El Director Ejecutivo podrá designar los correspondientes Comités Técnicos para los programas de la Fundación y cuyas funciones serán: a)Orientar los aspectos técnicos de los programas para que respondan a los mejores intereses de los beneficiarios.b)Promover enlaces entre programas de la Fundación, otras entidades y beneficiarios. c)Sugerir oportunidades de Investigación para consdieración en los programas de la Federación.CAPITULO VIII. EJERCICIO ECONOMICOS Y BALANCE GENERAL. Art.28. Los ejercicios económicos dela Fundación se iniciarán el día primero de enero y terminarán el treintw y uno del mes de Diciembre de cada año.Anualmente se practicará un balance y se formulará un estado de resultados del perpiodo fiscal, el cual será presentado a la Asamblea General a través del Consejo de Administración.En todo presupuesto y balance de la Fundación quedará indicado de forma clara y expresa los montos en concepto de gastos para la administración corriente y los gastos para la ejecución de los programas correspondientes.Art.29. Se practicará anualmente una revisión de las operaciones financieras por un auditor externo conforme a lo establecido en el Artículo 22 inciso b) de los presentes Estatutos y en el Reglamentoe Interno de la Fundación. CAPITULO IX. DISPOSICIONES GENERALES. Art.30. Las resoluciones del Consejo de Administración y Comité de Vigilancia serán de efecto inmediato, pero deberán ser refrendados por la Asamblea General.Art.31. LaFundación se disolverá: a)Por los votos de las dos terceras partes de los socios activos de la Fundación, en Asamblea General Extraordinaria,especialmente convocada a tal fin.b)Por las demás causas legales establecidas. Art.32. En caso de disolución de la fundación, la Asmblea General Extraordinaria, determinará la forma de liquidarla y el destino que se le dará a la misma. En todo caso, después de liquidadas las obligacio-

311

PRIMERA CLASE
CINCUENTA CENTAVOS
1984 - 1987

Nº 0395574

nes, los bienes deberán ser destinados a instituciones sin fines de lucro con = objetivos similares a los de la Fundación.Art.23. La reforma de los presentes - Estatutos deberá acordarse en el seno de una Asamblea General Extraordinaria,convocada a talfin, y con el voto á favor de las dos terceras partes de los socios activos de la Fundación. Art.34. La Asamblea General aprobará, por simple mayoría un Reglamento Interno a los efectos oportunos.Cualquier reforma o modificación de dicho Reglamento Interno deberá cumplir los requisitos formales y de voto establecidos en el párrafo anterior del presente Artículo. CAPITULO X. DISPOSICIONES TRANSITORIAS.Art.35. Por el plazo de cuatro año, es decir, por dos = mandatos consecutivos, el cargo de Presidente del Consejo de Administración será desempeñado por el Secretario de Estado en el Despacho de Recursos Naturales.Una vez transcurrido dicho plazo inicial se entrará a lo previsto en el Capítulo V, Artículo 18, de los Estatutos de la Fundación. En todo caso, el titu ar de la = Secretaría de Estado en el Despacho de Recursos Naturales será miembro permanente del Consejo de Administración.CONSEJO DE ADMINISTRACION. 1.-Presidente. Miguel Angel Bonilla Reyes.Secretario de Estado en el Despacho de Recursos Naturales.- 2.- Vicepresidente. Anthony J.Cautenucci.Director, Agencia para el Desarrollo Internacional (AID).3.- Secretario: Jorge Ramón.Escuela Agrícola Panamericana.4.Tesorero: Fernando Lardizabal. Consejo Hondureño de la Empresa Privada.5. Vocal = Primero: Rodrigo Tartó. Centro Agronómico Tropical para Investigaciones y Enseñanza. 6. Vocal Segundo: Jane Lagos de Martel. Universidad de San Pedro Sula.7.- Vocal Tercero: Efraín Diaz Galeas. En Representación de las Organizaciones Campesinas.- COMITE DE VIGILANCIA.- 1.-Presidente: Ilsa Diaz Zelaya. 2.-Secretario = Ejecutivo: Carlos Rivas.3.- Vocal: Robert Waugh - Personal. La Asamblea eligió un Comité de Selección del Directorio Interino, y quedó establecido de la siguien-

312

te forma: Richard Eheeler. U. J. Grant.- Richard Zablah.- Stephen Wingert.- Jorge Bueso Arias.- Orestes Vásquez. Eduardo Aragón. Art. 36. Los presentes Estatutos entrarán en vigencia al ser aprobados por el Poder Ejecutivo.-Jorge Ramón. Secretario.-NOTIFIQUESE.- DOCTOR ROBERTO SUAZO CORDOVA.- PRESIDENTE CONSTITUCIONAL DE LA REPUBLICA.- EL SECRETARIO DE ESTADO EN LOS DESPACHOS DE GOBERNACION Y JUSTICIA.- ABOGADO OSCAR MEJIA ARELLANO."

Extendida en la ciudad de Tegucigalpa, Distrito Central, a los siete días del mes de junio de mil novecientos ochenta y cuatro.

ABOGADO OSCAR MEJIA ARELLANO.

313

STATEMENT OF INCORPORATORS

IN LIEU OF ORGANIZATION

MEETING

OF

FRIENDS OF CENTRAL AMERICA AGRICULTURE FOUNDATION, INCORPORATED

* * * * *

The certificate of incorporation of this corporation having been filed in the office of the Secretary of State, the undersigned, being all of the incorporators named in said certificate, do hereby state that the following actions were taken on this day for the purpose of organizing this corporation:

1. The following persons were elected as directors to hold office until the first annual meeting of stockholders or until their respective successors are elected and qualified:

Dr. Richard O. Wheeler

Dr. J. B. Penn

Arthur Lee Quinn

2. The board of directors was authorized to make and adopt the by-laws of the corporation and, in its discretion, to issue the shares of the capital stock of this

corporation to the full amount or number of shares authorized by the certificate of incorporation, in such amounts and for such considerations as from time to time shall be determined by the board of directors and as may be permitted by law.

Dated, June 20th, 1984.

J. L. Rivera

J. L. Rivera

J. L. Austin

J. L. Austin

D. L. Sipple

D. L. Sipple

State of Delaware

Office of Secretary of State

I, GLENN C. KENTON, SECRETARY OF STATE OF THE STATE OF DELAWARE DO HEREBY CERTIFY THE ATTACHED IS A TRUE AND CORRECT COPY OF THE CERTIFICATE OF INCORPORATION OF FRIENDS OF CENTRAL AMERICA AGRICULTURE FOUNDATION, INCORPORATED FILED IN THIS OFFICE ON THE TWENTIETH DAY OF JUNE, A.D. 1994, AT 10 O'CLOCK A.M.

! ! ! ! ! ! ! ! ! ! !

Glenn C. Kenton

Glenn C. Kenton, Secretary of State

AUTHENTICATION: 10271379

DATE: 06/20/1994

2317206037

316

CERTIFICATE OF INCORPORATION

OF

FRIENDS OF CENTRAL AMERICA AGRICULTURE FOUNDATION, INCORPORATED

1. The name of the corporation is:

FRIENDS OF CENTRAL AMERICA AGRICULTURE FOUNDATION, INCORPORATED

2. The address of its registered office in the State of Delaware is No. 100 West Tenth Street in the City of Wilmington, County of New Castle. The name of its registered agent at such address is THE CORPORATION TRUST COMPANY.

3. The nature of the business or purposes to be conducted or promoted is:

The corporation is organized exclusively for charitable religious, educational, and scientific purposes, including for such purposes, the making of distributions to organizations that qualify as exempt organizations under section 501 (c)(3) of the Internal Revenue Code of 1954 (or the corresponding provision of any future United States Internal Revenue Law).

The corporation is a non-stock nonprofit corporation.

No part of the net earnings of the corporation shall inure to the benefit of, or be distributable to its members, trustees, officers, or other private persons, except that the corporation shall be authorized and empowered to pay reasonable compensation for services rendered and to make payments and distributions in furtherance of the purposes set forth in Article Third hereof. No substantial part of the activities of the

corporation shall be the carrying on of propaganda, or otherwise attempting to influence legislation, and the corporation shall not participate in, or intervene in (including the publishing or distribution of statements) any political campaign on behalf of any candidate for public office. Notwithstanding any other provision of these articles, the corporation shall not carry on any other activities not permitted to be carried on (a) by a corporation exempt from Federal income tax under section 501 (c)(3) of the Internal Revenue Code of 1954 (or the corresponding provision of any future United States Internal Revenue Law) or (b) by a corporation, contributions to which are deductible under section 170 (c)(2) of the Internal Revenue Code of 1954 (or the corresponding provision of any future United States Internal Revenue Law).

Upon the dissolution of the corporation, the Board of Directors shall, after paying or making provision for the payment of all of the liabilities of the corporation, dispose of all of the assets of the corporation exclusively for the purposes of the corporation in such manner, or to such organization or organizations organized and operated exclusively for charitable, educational, religious, or scientific purposes as shall at the time qualify as an exempt organization or organizations under section 501 (c)(3) of the Internal Revenue Code of 1954 (or the corresponding provision of any future United States Internal Revenue Law), as the Board of Directors shall determine. Any such assets not so disposed of shall be disposed of by the Court of Common

312

Pleas of the county in which the principal office of the corporation is then located, exclusively for such purposes or to such organization or organizations, as said Court shall determine, which are organized and operated exclusively for such purposes.

4. The corporation shall not have any capital stock, and the conditions of membership shall be stated in the by-laws.

5. The name and mailing address of each incorporator is as follows:

NAME	MAILING ADDRESS
J. L. Rivera	100 West Tenth Street Wilmington, Delaware 19801
J. L. Austin	100 West Tenth Street Wilmington, Delaware 19801
D. L. Sipple	100 West Tenth Street Wilmington, Delaware 19801

6. The corporation shall have perpetual existence.

7. In furtherance and not in limitation of the powers conferred by statute, the board of directors is expressly authorized:

To make, alter or repeal the by-laws of the corporation.

8. Elections of directors need not be by written ballot unless the by-laws of the corporation shall so provide.

Meetings of members may be held within or without the State of Delaware, as the by-laws may provide. The books of the corporation may be kept (subject to any provision contained in the statutes) outside the State of Delaware at such place or

319

places as may be designated from time to time by the board of directors or in the by-laws of the corporation.

WE, THE UNDERSIGNED, being each of the incorporators hereinbefore named, for the purpose of forming a corporation pursuant to Chapter 1 of Title 8 of the Delaware Code, do make this certificate, hereby declaring and certifying that this is our act and deed and the facts herein stated are true, and accordingly have hereunto set our hands this 20th day of June, 1984.

J. L. Rivera
J. L. Rivera

J. L. Austin
J. L. Austin

D. L. Gipple
D. L. Gipple

320

I. Relationship of Research Foundation to Export Promotion Project

Research findings and ongoing research to improve varieties, cultivation practices, and methods are essential to the success of the Export Services Development Project. Ideally, an institutional structure to provide these requirements could be in place before a major ag. export promotion would be undertaken. Unfortunately, this is not the case. USAID/Honduras is simultaneously addressing both the research "infrastructure" problem through the Honduran Agricultural Research Foundation (522-0249) and the export agriculture problem (through this project), an essential strategy if Honduras is to exploit fully the CBI opportunity.

Simultaneous development requires a careful integration of both projects to ensure that:

1. Individual commodity systems are not promoted until an adequate knowledge base is available to assure reasonable prospects of profitable operation. This implies that some CS otherwise attractive will not be promoted until the necessary knowledge base is developed. The CS qualification process addresses this problem by establishing a formal procedure for consideration of all aspects of CS "Adequacy", including the knowledge base.

2. The research agenda of the Foundation is defined in light of practical prospects for successful export agriculture.

3. The growth and development of Foundation's programs staffing, and operations are planned and managed to emphasize activities supporting CS with significant prospects for easly profitable export operations.

4. The non-research activities of the Export Services Development Project tracks the same priorities as research activities, for example:

   a) TA and training programs should be developed first for QCS and soon to be qualified CS.

   b) The information system development process is managed to provide as much technical information as possible for QCS as soon as possible leaving support of other CS for future development.

   c) Grower Association development and support service operations will allocate more resources to operations affecting QCS and near QCS than operations benefiting CS unlikely to be qualified in the immediate future.

A prioritized CS list should be incorporated in the development of the Foundation research agenda and institutional development plan. However, it is recognized that it is the Board of the Foundation, not the design teams for the two projects which will make the final decisions on the Foundation's program. As the two projects follow somewhat different decision-making processes, the design teams for the two projects have consulted and have agreed to the following formulation:

The Foundation project establishes a permanent institutional infrastructure for research in Honduras. It is designed to do research and provide TA and training with heavy emphasis on activities supporting current and "near future" agricultural operations as distinguished from basic plant and soil science. As much, the relationship of the Foundation to export agriculture will be very close. The Foundation will be more like a U.S. University Experiment station than an international research center such as IRRI or CYMMIT.

Both the Foundation and Export Projects address NTEA. Both projects involve, albeit from different perspectives, research, technical assistance, training, and information services. The commodity systems of interest to the two projects are largely if not entirely the same.

While substantive areas of interest are essentially the same, the decision-making process and related institutional imperatives of the organizations involved are different and should be, given the purpose of the organizations and their supporting projects.

Project design teams for the two projects consulted in depth on these matters and reached the following conclusions:

1. It is expected that major export opportunities and major areas of research interest of the Foundation will coincide.

2. It is not institutionally appropriate to define a list of research priorities supportive of the Export Project at this time.

3. Close administrative and operational coordination of these two projects will assure direct, measurable benefits to Honduran farmers and their families, processors, shippers and traders/exporters within a short period of development. Without this serious attention to coordination and mutually agreeable assignments, confusion and needless duplication of resources might result A coordinating committee will be formed immediately upon project authorization.

4. The Export Project will define research needs of commodity systems under consideration and steps to initiate work on these systems under consideration and steps to initiate work on these problems. The Foundation will be the preferred source of research and technical

322

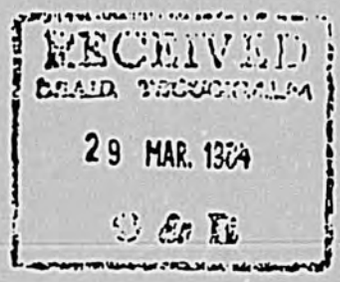
assistance for the Export Project. The Export Project through its agricultural implementing agency, FEPROEXAH, will make every possible effort to raise the necessary funding and procure these services from EHIA.

5. Quality assurance support (i.e. soil analysis; plague control measures; fertilizer formulaes) is perceived as an inmediate area of complementarity between both projects.

The Mission believes that this approach provides a flexible but operationally sound approach to the management of the intricate relationships between the two projects. The following chart identifies a number of these relationships and illustrates the necessity for careful integration of the two programs.

J. Expressions of Interest

J. 1



1271 AVENUE OF THE AMERICAS
NEW YORK, NEW YORK 10020
212 / 307-2525

SEYMOUR MILSTEIN
Chairman of the Board

March 22, 1984

ACTION Ag
No.
INFO OFFICES
D
PMD
FLA
MGT
POP
CONT
GEN
HRD
EHD/
PHN
EDU
PRD
H
G
HEA
C

Mr. Anthony J. Cauterucci
Mission Director
Agency for International Development
American Embassy
Tegucigalpa, Honduras

Dear Mr. Cauterucci:

I refer to your telex of March 7, 1984 summarizing telephone conversations relating to the creation of a private research foundation in Honduras which will become a center of excellence for agricultural research in diversified export crops, basic grains, bananas and plantains. Support for the foundation would be supplied by the private sector, government, International Development Agency and private firms.

This will confirm that United Brands Company is willing to donate certain research facilities at La Lima, Honduras. Generally, this will include buildings, equipment, records and furnishings. However, since we intend to maintain a small technical research facility, we will be keeping certain items and proprietary data and will advise later on this matter.

With respect to matching donations from Standard Fruit Company and Del Monte, we are willing to match donations up to a reasonable amount which we would determine later. However, please note that the donation of the research facilities is in itself a considerable donation.

I am pleased to learn that AID has obtained financing which will make this undertaking viable and I look forward to its starting activities. I trust that this will be forthcoming shortly, since as you know, we have a timetable for closing down the facilities.

Sincerely,

Seymour Milstein

324

Agosto 1o. de 1984.

Señor
STEPHEN WINGERT
A. I. D.
Tegucigalpa, D. C.

Estimado Señor Wingert:

Confirmando nuestra conversación telefónica, me es grato informarle que nuestra Empresa Molino Harinero Sula, S. A. con mucho gusto se-asociará con el nuevo proyecto de las Empresas Americanas y para tal efecto, quisiéramos remitir un cheque por la cantidad de L 10.000.00 como aportación inicial nuestra.

Mucho le agradeceré darnos el nombre completo de la empresa que se - fundará para enviarles el cheque en referencia.

Estamos seguros de que en Honduras hay muchas Empresas más que gustosamente se unirán a un esfuerzo tan necesario y noble como el que tuve la oportunidad de escuchar a los señores que visitaron el sector - de la Costa Norte en días pasados.

Con muchos saludos personales, quedo de usted por su atento y seguro servidor.

MOLINO HARINERO SULA, S. A.

BORIS GOLDSTEIN
Presidente.

BG:sja.

325

cc: Sr. A. Cauterucci
Director, USAID

REF: FAOR/TA 9/1/TCP/HON/2304/289/84

11 de junio de 1984

Señor Presidente:

Como es de su conocimiento, nuestra Organización está sumamente interesada en apoyar las gestiones del Gobierno de Honduras con el fin de posibilitar la continuación del Programa de "Mejoramiento Genético del Banano y Plátano" en la Estación Experimental en La Lima, Cortés.

En tal sentido, la FAO ha considerado que existe la necesidad de movilizar recursos adicionales provenientes de otros países interesados en la producción de banano y plátano y compartir los gastos de investigación, así como los resultados y materiales producidos, considerandose para ello, la posibilidad de que los representantes de los países donantes participen en el monitoreo del Programa.

En el caso de existir un alto grado de certidumbre respecto al deseo de otros países de contribuir y participar, nuestra Sede Central nos ha indicado que está en disposición de apoyar una eventual segunda fase del proyecto TCP/HON/2304 (E) para la continuación de las actividades del Programa.

Hago propicia la ocasión para reiterar a usted un atento saludo.

CARLOS BASTANCHURI
Representante de la FAO
en Honduras

Señor
Presidente de la Fundación Hondureña
para la Investigación Agrícola (FHIA)
Ing. Miguel Angel Bonilla Reyes
Ciudad

326

AID respaldará exportación de cultivos no tradicionales

LA PRENSA 7-24-84

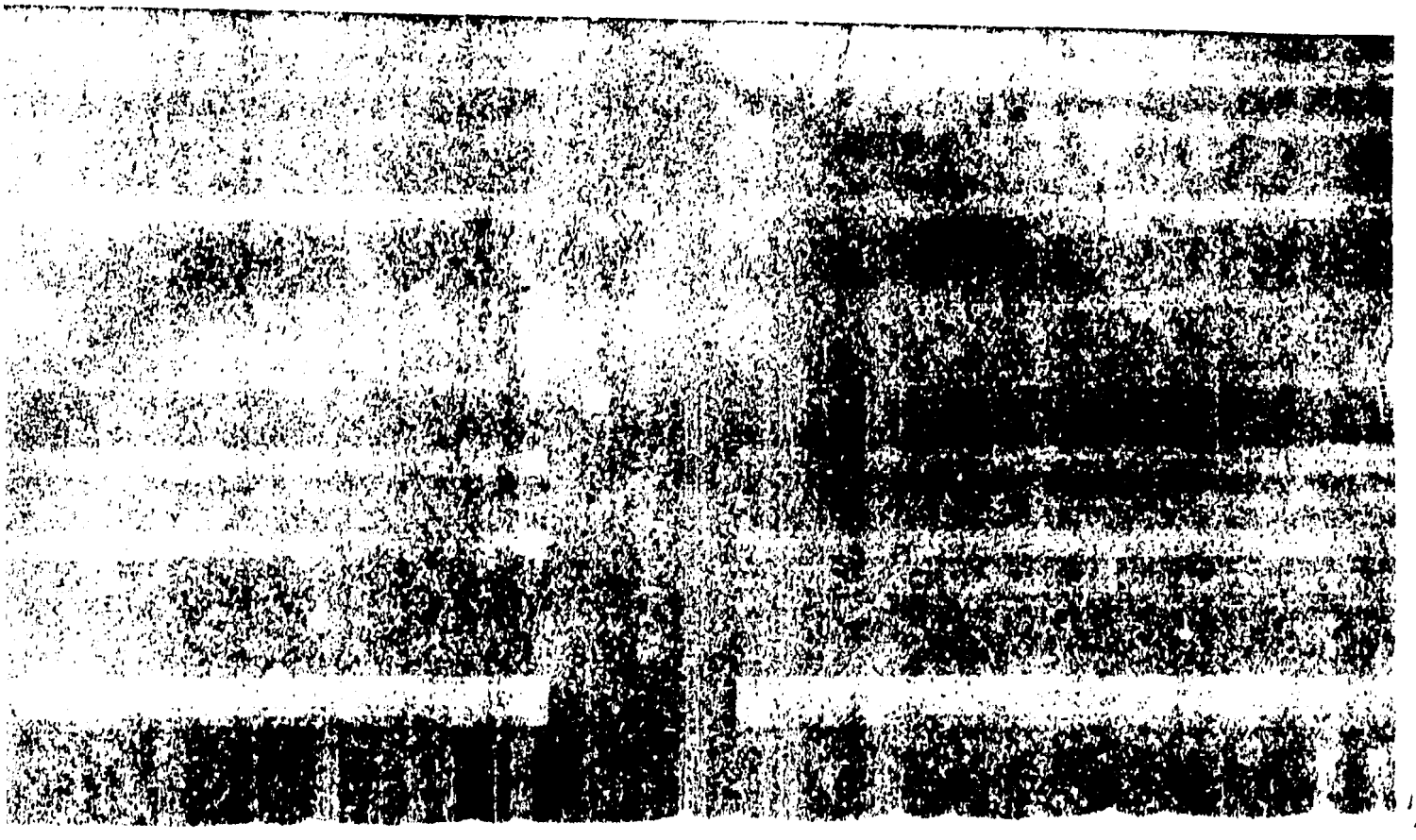
TEGUCIGALPA.- Los representantes del sector público-agrícola del país y de la Agencia para el Desarrollo Internacional, se reunieron hoy para concretar el aspecto financiero con que deberá trabajar la Fundación Hondureña de Investigación Agrícola.

Durante dos horas de diálogo, los integrantes de la FHIA acordaron brindar un total apoyo al gobierno en materia de investigación hacia aquellos cultivos no tradicionales de exportación. El titular de Recursos Naturales, ingeniero Miguel Angel Bonilla, actual coordinador de la fundación, declaró que este proyecto se desarrolla desde los primeros días de julio.

Indicó que en la reunión la AID ha contemplado su apoyo financiero con un monto de 20 millones de dólares para el programa de que durará 10 años, o sea que se invertirán alrededor de 4 millones de lempiras en cada período.

Bonilla dijo que anualmente el gobierno aportará una contraparte de 400 mil lempiras, canalizados por las instituciones participantes en la fundación, siendo éstas: Recursos Naturales con 200 mil; Economía, el INA, el IHCAFE y el Banco Central, 50 mil cada uno.

Manifestó que la FHIA estudia la posibilidad de diversificar la producción agrícola, que es una de las mejores condiciones para que el Estado hondureño obtenga divisas con la exportación de los cultivos no tradicionales.



K. Description of Physical Plant, Equipment and Facilities, and Summary of Value Assessment

The Tropical Research Center facilities donated by United Brands to the Foundation include two major compounds: The central La Lima facilities and the Guarumas Experimental Farm. Both facilities have telephone service, electricity, drinking water, sewer systems and access to year-round roads. La Lima offers good banking services, a hospital, primary and secondary schools (including a bilingual American system school) and it is adjacent to an international airport with daily service to Miami, Houston and New Orleans. La Lima is 10 miles from San Pedro Sula, a major industrial and service center and the second largest city of Honduras.

La Lima Facilities

The facility includes approximately 20,000 square feet of laboratory, office, library, conference rooms, repair shop, storage and greenhouse construction on 4 acres of land. The 18 buildings, including the facility, are totally furnished to sustain an active operation, including telex service and telephone switchboard. It does not include computer facilities and vehicles, as these two items are not included as part of the donation to the Foundation.

The facilities include a soil analysis laboratory which is capable of carrying out large numbers of all standard soil and plant foliar analysis, using advanced techniques. As an example, approximately 35,000 samples were processed in 1979 in this laboratory.

Post harvest research facilities include nine well conditioned environmental chambers, with temperature, humidity and gas exchange control plus an in-site trailer to simulate transportation conditions.

A fully equipped entomology/nematology building with an extensive insect collection is available at the La Lima center.

Several plant pathology laboratories with enough equipment to carry out fungal and bacteriological work are also available. In addition, there is sufficient greenhouse space for plant propagation and related experimental work.

Photography and video facilities are part of the compound and have been used in the past to produce technical printouts and video cassettes for distribution to both technical and producer audiences.

The La Lima complex also includes a library containing standard reference books on tropical agriculture and a collection of journals and several archives with information on past United Brands crop research.

The Guarumas Experimental Farm

This facility is only two miles from La Lima and has been used in banana and plantain breeding for about 25 years. It comprises approximately 130 acres of alluvial soils with irrigation, drainage and access year-round. There are 8 buildings in the area, including a small house, office, repair shop, greenhouses and storage facilities. All of these have electricity, drinking water, sewer system and telephone lines.

This farm contains an irreplaceable collection of banana/plantain germplasm brought from different parts of the world, observed and tested for different desirable traits (disease resistance, plant height, etc.) and used for genetic improvement. (Informal assessment has placed a value of $6-10 millones on the germplasm bank) About 500 specimens exist in Guarumas presently.

Field equipment (tractors, wagons, etc.) is available to maintain operations in the farm, although increased activities will demand additional equipment.

A complete list of all physical plant, equipment and land is available at the AID mission Agricultural Office in Honduras. A complete assessment of value of the United Brands donation to the Foundation was conducted by a private firm in April, 1984. A summary of that assessment follows:

San Pedro Sula, 18 de abril de 1984

Sr. G. C. Millensted
Director de TROPICAL RESEARCH
TELA RAILROAD COMPANY
La Lima, Cortés

Estimado Sr. Millensted:

Cumpliendo sus instrucciones, hemos realizado el avalúo de las propiedades de la División de "**TROPICAL RESEARCH**", ubicadas en la ciudad de la Lima, Cortés, y en la zona denominada "**BREEDING**", ubicacada en la Guaruma No. 1, de ese mismo Municipio.

Basados en la información proporcionada de planos e inventarios, procedimos a la revisión de cada edificación,y constatamos el inventario de Equipo con que cada Departamento y oficina cuenta; estableciendo valores monetarios actuales.

Esperamos que el presente trabajo detallado a continuación satisfaga los requisitos de su solicitud.

Sin otro particular, nos es grato suscribirnos de usted,

Muy atentamente,

Roberto Pineda Fasquelle

RPF/rlrz.
cc : Arch.
Anexo: lo indicado

AVALUO DE LAS INSTALACIONES Y EQUIPO

DE 'TROPICAL RESEARCH''

PROPIEDAD DE LA

'TELA RAILROAD COMPANY ''

AVALUO DE LAS PROPIEDADES Y EQUIPO DE LA DIVISION

DE "TROPICAL RESEARCH" (TELA RAIL ROAD COMPANY)

UBICADAS EN LA CIUDAD DE LA LIMA, CORTES.

PERSONAL QUE COLABORO PARA EL DESARROLLO DE ESTE TRABAJO :

ROBERTO PINEDA FASQUELLE	INGENIERO
LUIS FEDERICO PALMA CERNA	ARQUITECTO
GUILLERMO ZELAYA	ARQUITECTO
JOSE L. PALMA	DIBUJANTE
MANUEL PEÑA	DIBUJANTE
SUYAPA ORTEGA	SECRETARIA

RESUMEN TOTAL

a)	Edificaciones "Tropical Research"	Lps.	968,515.00	
	Valor Total del Terreno	Lps.	415,883.00	
b)	Edificaciones del Breeding	Lps.	191,260.00	
	Valor Total del Terreno	Lps.	121,406.10	
	Valor Total del Terreno	Lps.	775,000.00*	
	TOTAL EDIFICACIONES Y TERRENOS			Lps. 1,697,064.20
c)	Equipo del "BREEDING"	Lps.	159,243.00	
d)	Equipo del "TROPICAL RESEARCH"	Lps.	977,403.36	
	TOTAL DEL EQUIPO			Lps. 1,136,646.36
	TOTAL DEL TERRENO, EQUIPO Y EDIFICACIONES			Lps. 3,608,710.56

*Value of 130 acres of banana breeding land not included in valuation.

ANTECEDENTES

En un área de 16,635.32 metros, se encuentran ubicados 18 edificios que comprenden la división de "TROPICAL RESEARCH", propiedad de la "TELA RAILROAD COMPANY", las cuales remontan su construcción a la década de los 50, hasta el año 1959 en que se construye el edificio de Laboratorio Analítico.- En la zona de Guaruma 1 se encuentra la sección del "BREEDING", también parte del "TROPICAL RESEARCH", y en donde se encuentran 8 edificaciones en un área de 8,093.74 M2, que remontan su construcción a la década del 60.

INDICE DEL PRESENTE TRABAJO

a) Resumen de las evaluaciones del TROPICAL RESEARCH, y comentarios.
b) Resumen de las evaluaciones del "BREEDING", y comentarios.
c) Secuencia fotográfica de las instalaciones y detalle de los elementos constructivos.
d) Planos esquemáticos de los diferentes edificios.
e) Evaluaciones individuales por local en cada uno de los edificios que detallan los elementos constructivos y su situación actual.
f) Inventario de equipo con los valores comparativos de precio, según su estado actual.
g) Comentarios generales.

TERRENOS TROPICAL RESEARCH

AREA = 178,969.50 PIES CUADRADOS
16,635.32 M^2

TERRENOS DEL B R E E D I N G

AREA = 8,093.74 M^2 2 ACRES

A) RESUMEN DE LAS EVALUACIONES DEL TROPICAL RESEARCH Y COMENTARIOS

A.1)	Valor total de las edficaciones	Lps.	968,515.00
A.2)	Area Total del terreno	M^2	16,635.32

A.2.1. COMENTARIOS

El hecho de que en nuestro analisis aparezca un valor mayor de la propiedad es por las siguientes razones:

a) Elevación de los costos de construcción
b) Plusvalía del Terreno
c) Mejoras proporcionales al conjunto (Agua, Electricidad, etc.)
d) Consideración del cerco exterior
e) Parte componente de un complejo Arquitectónico

A.3.)	Valor catastro / M^2	Lps.	18.00 M^2
	Valor Asigando por mejoras	Lps.	25.00 M^2

RESUMEN

Valor Total de las edificaciones	Lps.	968,515.00
Valor total del Terreno	Lps	415,883.00
VALOR TOTAL	Lps.	1,384,398.00

B) RESUMEN DE LAS EVALUACIONES DE BREEDING.

B.1) Valor total de las Edificaciones Lps. 191,260.10

B.2) Area total del terreno M^2 8,093.74

B.2.1.) Valor catastro /M^2 ₤. 10.00 .·. V.T.Lps. 80,937.40

B.2.2.) Valor otorgado por mejoras en esta evaluación ₤. 15.00 .·. V.T.Lps. 121,406.10

B.2.3.) COMENTARIOS

El hecho de que en nuestro analisis aparezca un valor mayor de la propiedad es por las siguientes razones:

A) Elevaciones de los costos de vida.

B) Plusvalía del terreno.

C) Mejoras proporcionadas al conjunto (Agua, eléctricidad, etc.)

D) Cerco exterior.

E) Parte componente de un complejo Arquitectonico.

RESUMEN

Valor total de las edificaciones	Lps. 191,260.10
Valor total del terreno	121,406.10
Valor total	Lps. 312,666.20

TROPICAL RESEARCH

EDIFICACION No.	AREA M^2	VALOR ESTIMADO M^2	VALOR ESTIMADO TOTAL
1. Research Laboratories Building	368.04	Lps. 200.00	Lps. 73,608.00
2. Laboratorio Analitico y Oficinas Químicas y Agronomía	439.37	480.00	210,897.60
3. Administrativo de Investigación Tropical	492.02	310.00	152,526.20
4. Anexo de laboratorios a Oficinas de Administración	615.51	280.00	172,342.80
5. Baños y Bodega	28.35	80.00	2,268.00
6. Bodega	65.64	150.00	9,846.00
7. Cuartos de Maduración	202.84	180.00	36,511.20
8. Wooden Old Research Building	474.80	100.00	47,480.00
10. Invernaderos	374.22	150.00	56,133.00
11. Taller Mécanico	168.84	-0-	16,178.80
12. Bodegas	174.84	80,00	13,987.20
13. Rampa de Engrase			411.00
14. No se incluye en este avaluo	-	-	-
15. Bodega	30.90	80.00	2,472.00
16. Invernaderos (Anexos a Entomología)	231.57	280.00	64,839.60
17. Entomología	224.87	280.00	62,963.60
18. Vivero a cubierto	307.00	150.00	46,050.00
		VALOR TOTAL	Lps. 968,515.00

Nota.- Ver plano de conjunto para reconocer nomenclatura de Edificios.