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Philippines

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Agricultural Research II



PROJECT PAPER

OCTOBER 1978

AGRICULTURAL RESEARCH II

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AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT PAPER FACESHEET	1. TRANSACTION CODE <div style="border: 1px solid black; padding: 2px; display: inline-block; margin-right: 5px;">A</div> A ADD C CHANGE D DELETE	PP <hr/> 2. DOCUMENT CODE 3
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3. COUNTRY/ENTITY <p style="text-align: center;">Philippines</p>	4. DOCUMENT REVISION NUMBER <div style="border: 1px solid black; width: 20px; height: 20px; margin: 0 auto;"></div>		
5. PROJECT NUMBER (7 digits) <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">492-T-0286</div>	6. BUREAU/OFFICE A. SYMBOL ASIA	B. CODE <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">04</div>	7. PROJECT TITLE (Maximum 40 characters) <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">Agricultural Research II</div>
8. ESTIMATED FY OF PROJECT COMPLETION FY <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">84</div>	9. ESTIMATED DATE OF OBLIGATION A. INITIAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">79</div> B. QUARTER <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">2</div> C. FINAL FY <div style="border: 1px solid black; padding: 2px; display: inline-block; margin: 5px;">81</div> (Enter 1, 2, 3 or 4)		

10. ESTIMATED COSTS (\$000 OR EQUIVALENT \$) -						
A. FUNDING SOURCE	FIRST FY			LIFE OF PROJECT		
	B. FX	C. L/C	D. TOTAL	E. FX	F. L/C	G. TOTAL
AID APPROPRIATED TOTAL	5,000	-	5,000	10,000	-	10,000
(GRANT)	-	-	-	-	-	-
(LOAN)	5,000	-	5,000	10,000	-	10,000
OTHER U.S. 1.	-					
2.	-					
HOST COUNTRY 7.5/1	-	6116	6,116		36,076	36,076
OTHER DONOR(S)						
TOTALS				10,000	36,076	46,076

11. PROPOSED BUDGET APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E 1ST FY <u>79</u>		H 2ND FY <u>80</u>		K 3RD FY <u>81</u>	
		C GRANT	D LOAN	F GRANT	G LOAN	I GRANT	J LOAN	L GRANT	M LOAN
(1) FN	B 141		080		5,000				5,000
(2)									
(3)									
(4)									
TOTALS					5,000				5,000

A. APPROPRIATION	N 4TH FY <u>82</u>		O 5TH FY <u>83</u>		LIFE OF PROJECT		IN DEPTH EVALUATION SCHEDULED
	P GRANT	Q LOAN	R GRANT	S LOAN	T GRANT	U LOAN	
(1) FN	-	-	-	-	-	10,000	
(2)							
(3)							
(4)							
TOTALS						10,000	

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

NO
 YES

14. ORIGINATING OFFICE CLEARANCE SIGNATURE <i>Lane E. Holdcroft</i> TITLE Lane E. Holdcroft Chief, Office of Agricultural Dev.	15. DATE DOCUMENT RECEIVED IN AID # OR FOR AID. W/ DOCUMENTS DATE OF DISTRIBUTION DATE SIGNED: 01 03 79
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Part 1. Project Summary and Recommendation

A. Facesheet

B. Recommendations

Loan **\$ 10,000,000**

(Terms: 40 years, 10
year grace, 2% during
grace - 3% thereafter)

Total new A.I.D. obligations **\$ 10,000,000**

C. Description of the Project

This project will provide additional A.I.D. support for improving and increasing the Philippine capability for conducting research in agriculture, forestry and fisheries, aimed at accelerating the generation, field verification and dissemination of new technology appropriate for resolving the problems of the small farmers that constitute the foundation of Philippine agriculture.

More specifically, the purpose is to improve the research capability in eight research centers. Four of these are multi-commodity national centers and one single commodity research center. All five have national as well as regional research responsibility. They do both basic and applied research. The remaining three are regional research centers. Primarily, they do applied research on commodities of major importance in the region where located. Technology packages evolved in the national centers will be fine tuned in the regional centers for adaptation to the needs and conditions of the regions. The research centers are:

1. National

- a) Central Luzon State University (CLSU)
- b) University of the Philippines at Los Baños (UPLB)
- c) Visayas State College of Agriculture (VISCA)
- d) University of Southern Mindanao (USM)
- e) Forest Research Institute (FORI)

2. Regional

f) Palawan National Agricultural College (PNAC)

g) Mariano Marcos State University (MMSU)

h) Cagayan Valley Institute of Technology (CVIT)

The CLSU and USM are two of the four centers previously assisted. The support proposed for these two centers is to assist in upgrading and expanding their research capabilities in additional research assignments resulting from the recently modified station network of the GRP national research system.

The centers assisted by this loan will bring to ten the number of centers assisted by the A.I.D. There is a network of sixteen research centers in the GRP research system.

The centers to be assisted were selected on account of their strategic locations for serving the needs of a variety of ecological zones and the small farmers within those target areas. Other considerations were the availability of leadership to head up development and suitable land area for conducting the work. The research will include alternate crops, cropping patterns and alternate technologies for a variety of food and food crops, as well as selected cash crops and livestock grown by small farmers.

A secondary objective of the proposed loan is to strengthen PCARR's leadership role in the administration and management of agricultural research resources.

The inputs from the loan will be used to finance the following components:

Manpower Training - Graduate level training in local institutions involving 329 staff for a total of 750 man-years. Foreign training will be in the form of seven staff for the doctoral degree or a total of 21 man-years, and up to 95 staff for short-term upgrading/refresher and attendance in international conferences and short study tour/observation involving a total of 287 months. Technical consultants will provide a total of 180 man-months of service, 24 international experts and 156 from in-country experts.

Equipment - consisting of offshore procurement of field and laboratory equipment and materials as well as materials for upgrading the libraries of the research centers.

Infrastructure - constituting the largest component of the loan cost-wise, it is programmed to provide physical facilities like research laboratories, greenhouses, headhouses, screenhouses, service buildings, experimental farm improvement, staff housing and site development including utilities.

D. Summary Findings

Critically important to the economic development and welfare of the Philippines is increasing food production to meet the increasing demand pressure from an expanding population. Land-use intensification is the only feasible approach to increased production in the light of the very limited area of new land that can be placed under cultivation. The required increases in productivity cannot be achieved without an efficient agricultural research system which focuses on the more pressing problems of the millions of small farmers that form the base of Philippine agriculture. Packaging of farming technology to meet the precise needs of those countless small farmers laboring under a variety of environmental and sociological situations is of utmost urgency. The potential generators of such technology packages are available in the rural areas. There have been over one hundred government field stations working on crops, livestock, fisheries, etc., but these have been very loosely coordinated and niggardly funded and have not been effective in assisting the farmers. The approach adopted by PCARR in bringing together selected stations with certain degrees of research capability and developing them into research centers appears to be the most logical and practical solution. Upgrading is being undertaken in terms of improving the research laboratories, fields, equipment, and personnel, as well as management procedures. Development of such technology generating centers in the rural areas is the most rational companion-program to the government development approach based on the concept of regional development as both a goal and a means to national development. As organized, the national and regional research centers already operational under the leadership of PCARR are beginning to take a lead role in both the formulation and execution of the research programs which are aimed at backstopping the agricultural development programs of the regions as coordinated under the guidance of the National Economic and Development Authority with which PCARR has established a close working relationship.

The proposed loan project together with the first loan will place in position ten such research centers to play the development role intended for them. These represent about two-thirds of the 16 research centers being developed in the PCARR station network for the decentralization of the research effort. With the increasing support the Philippine Government is providing PCARR in the modernization of the agricultural research system, the viability of the project is believe assured.

Part 1

E. Project Issues

Focus of research thrusts to the needs of the small farmers

The large number of small farmers constituting the base of Philippine agriculture is in itself both a logical and compelling basis for the nation's agricultural research system to strive to satisfy the needs of those small farmers. The total cultivated area of 8.5 million hectares (21 million acres) is farmed by approximately 2.4 million farmers or an average of about 3.6 hectares per unit. Under the circumstances the research program cannot but be necessarily geared to the welfare of this critical sector of the economy. Nevertheless, there are a number of major activities highlighting the concern for the small farmers that have been undertaken.

Farming Systems has been established as a separate commodity research program under the new research organization. This is primarily geared to land use intensification in the small-sized farms as a means of increasing the farmer's income and thereby improving the quality of his living. This will involve crops, livestock, fisheries, and forestry or any combination thereof, both in terms of production and its economics. One-third of the 32 national commodity research programs have placed farming systems as a priority area of study. Moreover, two-thirds of the commodity research programs have pinpointed the transfer of technology (or extension) from the research sector to the farmers as an urgent research related thrust. The development of small farm tools and equipment as well as farm financing and cooperatives are likewise designated as priority study areas.

The updated commodity research programs and field station network now identify specific areas where farmers' field trials are to be undertaken. Supportive of this effort there has been created in the Department of Agriculture a new unit designed to help accelerate and systematize technology transfer into the production process. At this point in the development of the research system there has been pinpointed for the commodity research programs, benchmark yield data on three levels: (1) at experiment stations, (2) at farmers' fields under controlled experiments, and (3) under actual farm conditions. In most cases the gaps are wide between the second and third levels, pointing to an urgency in closing the gap in the information delivery system. Location of the five national training centers for extension agents at research centers will expedite the transfer of research findings to the field as well as improve

communications between researchers and field agents. Also, the participation of village (Barangay) farmer leaders in training programs at the research centers (Annex G) will help close the information gap and strengthen the focus on the needs of small farmers.

Primarily to bolster the small-farmer feedback mechanism on research program formulation, appointed to membership in the PCARR's Technical Program Planning and Review Board are two representatives of the small farmers. One is from an agricultural cooperative with a large membership. The other is a small farmer actually farming less than two hectares of cropland. His being an officer of the "Samahang Nayon", the lowest political governmental unit on the village level, and member of a Multiple Cropping Farmers' Association enables him to be in constant touch both with his fellow-farmers and others in the community who might have any involvement in the various phases of the agricultural enterprise.

PCARR's administrative and financial capability to bring major institutional improvements in the research centers

Increasing budgetary support to PCARR as shown below is a definite indication of the present administration's continuing support to the establishment of a viable agricultural research system as a means to hasten economic development.

1973 (8 mo.) -----	₱ 1.5 million
1974 -----	6.0 "
1975-----	14.0 "
1976-----	23.2 "
1977-----	51.4 "
1978-----	62.0 "

The planning, monitoring and evaluation system established by PCARR is a welcomed tool for the Government Budget Commission in its desire to more adequately evaluate the effectiveness of the yearly appropriations for research. The tie-up between these two agencies is approaching the stage whereby research fund releases by the Commission will be based on PCARR's recommendations. This will mean that not only will every peso appropriated for research will be accounted for, but that more research undertakings will be directed to identified priority areas supportive of development goals.

Staff retention in the research centers

Decernible to a noticeable degree is the rate at which the outward movement of personnel from the stations in the research network is gradually being minimized with the advent of the program to upgrade the Philippine agricultural research system. Of the 225 scholarships for graduate study presently scheduled under the PCARR program over 95% are in the research station network. Loan I is partly financing this study program. Many of the colleges in the station network are able to obtain additional scholarships through their respective agency budgets and such other donors as the Ford Foundation, Colombo Plan and the like. Through this incentive some of the colleges are even able to recruit into their staffs outstanding new graduates who generally are able to secure better-paying jobs outside these institutions. Post-doctorate study grants and short term study tours and observational training offer additional incentive. Salary increases have and are contributing to personnel retention. Recently, in a number of state agricultural colleges in the station network, salaries practically doubled. PCARR is directly granting additional incentive to the researchers doing priority projects in the form of honoraria which increase with the scope of the research undertakings. By mutual arrangement with regular agencies a scheme has been started whereby researchers doing agency-funded projects also receive similar incentive pay for work done beyond a certain number of research projects. The prospects of better working environments with improved laboratory and field infrastructure, equipment, library references, as well as staff housing in the research centers is encouraging the retention of researchers. This research loan together with new monies in the form of the accompanying GRP counterpart will bolster this research capability development program in great measure.

Part 2. Project Background and Detailed Description

A. Background

This project is the second phase of loan assistance to the GRP to help the Philippine Council for Agriculture and Resources Research (PCARR) develop a research capability to provide improved technological packages relevant to small farmers living in different ecological zones.

The first loan for five million dollars to assist in up-grading of personnel and facilities at four research centers was signed December 23, 1975 and implementation plans are approximately eighty percent completed.

In an effort to build and expand on activities funded under the first loan, Loan II will assist in upgrading personnel and facilities at eight research centers, including the University of the Philippines

at Los Baños (UPLB). A major thrust of the loan is to improve the research capability at these centers to develop improved farming systems relevant to small farmers within the respective target areas. These centers represent a variety of climates, soil types and socio-economic zones so it is anticipated that relevant farming systems will vary among regions but include improved plant materials, cropping patterns and practices for a variety of basic food and feed crops, including but not limited to rice, corn, sorghum, soybeans, other food legumes, root crops, vegetables, livestock, tree crops, and fisheries. These crops may be interplanted with tree crops or in rotation with forage crops for livestock. Livestock and cash crops will be addressed in appropriate centers. Improved farming systems will contribute to increased production by small farmers which should contribute to the sector goals of increasing income to small producers, national self-sufficiency in basic food and feed production, and to improved national nutritional levels.

The importance of agricultural development in general and increased agricultural productivity in particular cannot be overemphasized. At the current population growth rate, the Philippines must feed an estimated average of 1.7 million additional people each year over the next 25 years. Unfortunately, the past practice of increasing food production by increasing the land area tilled can no longer be pursued. The solution lies in increased production per unit of arable land which requires the application of improved technology, diversification and intensification to existing crop land in the widely varying climate and physical environments of the Philippines.

The necessary increase in productivity will not be achieved without an intensive and relevant agricultural research program focused on the development of more productive planting materials suitable to the physical and biological resources prevailing in the target regions. Equally important is the conduct of adaptive research to exploit the yield potentials by developing more precise packages of practices and to seek ways to increase diversification and broaden the base of production for small farmers. This suggests that attention be given to alternative crops, to livestock improvement, to land and irrigation development, to related soil and water management, to farm management and production costs and to economic and social issues so as to minimize other problems of income distribution. Additionally, relevant research involving regional educational centers will contribute much to enriching the training offered which will impact favorably upon the quality of programs extended to farmers.

In addition to addressing the crucial balance of food production of increasing population pressure, development of agriculture is critically important to the overall economic development of the Philippines. Despite advances in industry and trade, the Philippines continues to be very much an agricultural economy. Seventy percent

of the population live in the rural areas, and the 2.4 million small farm units, representing 80 percent of the farm families, constitute the backbone of the agricultural sector. These small farmers till five hectares of land or less with 3.6 hectares representing the average holding and from such units provide a livelihood for 55 percent of the population. The rural sector also contributes approximately one-third of the Gross National Product and two-thirds of the export earnings. Yet, the per capita intake of food calories is 15 percent below the recommended daily allowance and protein intake 5 percent deficit despite consumers using 54 percent of their expenditures for food. Agricultural imports constitute approximately 11 percent of the total imports of the country.

Clearly the economic and social needs require increased agricultural productivity, particularly of basic foods and feeds, which in turn is greatly dependent upon more and better research. That agricultural research pays handsome dividends has been demonstrated by many studies. Equally relevant is a study by Evenson (1973)^{1/} which pointed out that indigenous research capabilities are important to the transfer of technology. Where there were no indigenous research programs, transfer of technology from International Research Centers was practically zero, i.e., costless transfer apparently does not exist. The Philippine Government has recognized the need for location-specific research capability in its program of development and improvement of regional research centers. This loan is to assist in that undertaking.

B. Detailed Description

The primary purpose of this research assistance activity is institution building in character but more fundamentally aimed at increasing and accelerating the generation of new technology applicable to the problems of the small farmers that characterize Philippine agriculture.

More specifically, the purpose is to improve the research capability in eight selected National and Regional Research Centers.

The National and regional research centers selected to receive assistance under this loan are a part of the National Network of Research Centers and Stations previously identified, and recently revised by PCARR.^{2/} These are:

1. National Research Centers

a. Multi-Commodity

- (1) Central Luzon State University (CLSU)

^{1/}Agricultural Research Productivity, R. E. Evenson, Proceedings of the Seminar on Institutionalizing Research Management in Asia, December 1973.

^{2/}For a detailed description of the PCARR organization and network, see Annex F

- (2) University of the Philippines at Los Banos (UPLB)
- (3) Visayas State College of Agriculture (VISCA)
- (4) University of Southern Mindanao (USM)

b. Single Commodity

- (1) Forest Research Institute (FORI)

2. Regional Research Centers

- (1) Palawan National Agricultural College (PNAC)
- (2) Mariano Marcos State University (MMSU)
- (3) Cagayan Valley Institute of Technology (CVIT)

3. Station Network Priorities - The revised order of priorities in the station network as well as the principle function of each class of research center/station are as follows:

- (a) Multi-Commodity National Research Centers
- (b) Single Commodity Research Centers
- (c) Regional Research Centers
- (d) Cooperating Field Stations
- (e) Cooperating Agencies/Individuals

The descriptions and primary roles of the various research centers and stations are described hereunder:

(a) Multi-Commodity National Research Centers

A national research center must develop the capability to do research across a broad range of disciplines in agricultural and natural resources development.

It will be responsible for both basic and applied research. Research in the basic disciplines like systematics, physiology, biochemistry, genetics, biometry, etc. are to be conducted at the national centers. Applied research in pathology, silviculture, ecology, and the like, which require strong support from the basic disciplines would likewise be conducted in the national centers.

Moreover, the national centers would put together packages of technology appropriate for different commodities and/or dominant farming or production systems to be verified by regional centers and/or cooperating field stations distributed throughout the country.

(b) Single Commodity Research Centers

The single commodity-based research center is distinguished from the multi-commodity national research centers in that it concentrates in only one commodity. It is allowed as an exception to the general pattern of multi-commodity research centers because of some particular circumstances like the existence of a national authority responsible for a commodity and adequately funded by a tax levy.

(c) Regional Research Centers

In contrast to the national centers, regional research centers have responsibility for the conduct of applied research for commodities of major importance in the region where they are located. They conduct studies to localize the findings from the national centers. Packages of technology conceptualized in the national centers would be finetuned at the regional center for application or adaptation to the needs and conditions of the region.

(d) Cooperating Field Stations

Cooperating field stations must provide facilities and/or sites where on-farm trials or field experiments are undertaken to determine the micro differences in environment. Only the most promising and locally relevant treatments are included. The field station must have an adequate experimental farm and a small professional staff and labor force to manage specific field experiments.

(e) Cooperating Agencies/Individuals

Cooperating agencies/individuals are those participating in the conduct of certain phases of research either as an institution, group, or individual. Such cooperators are involved in the research not necessarily because they have fixed facilities (as field stations or laboratories) but because of their expertise and capabilities.

For the PCARR network of sixteen research centers with their respective commodity assignments, please refer to Annex I

The inputs from this loan will be used to help finance the following components:

1. Project Inputs

a. Technical Services

Assistance in the form of consultants from both international and in-country sources will be obtained on an intermittent basis during the life span of the project. Technical assistance will be used to address specific technical research and administrative problems as well as to conduct economic-social investigations relevant to technology transfer. Assistance will be given to the new centers and cooperating stations to help in the design and implementation of research while permanent station staff are being trained. Experienced qualified personnel from the University of the Philippines and other in-country institutions will be contracted to serve for various periods at the new centers as well as to offer in-service training and to be on call to assist with technical problems as they arise. The present shortage of professionally qualified economic and social research personnel available to the research network is recognized and the services of qualified experts will be obtained to carry out necessary finite studies.

In that approximately seven person months of in-country expertise can be obtained for the cost of one month of international technical service as well as in-country experts possessing a significantly broader knowledge base of local problems and cultural impediments, the procedure is rational. A total of 24 person months representing 49 percent of the technical assistance costs and 156 person months representing 51 percent of the costs have been allocated respectively for off-shore and in-country consultants. The extent of the assistance is shown in Tables 1 and 2. As in Loan I, USAID will provide on a grant basis, an experienced direct hire Project Manager having a research background to assist in the implementation of the loan.

b. Personnel Training

(1) International Training

Ph.D. degree training in external institutions is allotted seven participants for a total of 252 man-months; up-grading or refresher for staff, 24 participants requiring an estimated 216 man-months; and attendance in scientific conferences and short study or observation study, 71 participants for an estimated 71 man-months.

Degree training in foreign institutions will be confined to technical fields wherein local institutional capability is limited. Some of the seven positions will be used to upgrade and/or reinforce the faculty of the University of the Philippines at Los Banos which is the principal training institution that will provide the over 1,200 doctoral and masteral degree graduates required to man the national research network to the desired degree of development.

The development of agriculture and the improved socio-economic status of the million of farm families throughout the Philippines, depends to a large extent on capable graduates entering positions involving research, extension, and agricultural industries in the country. The 24 positions for the post graduate type (6-12 months) proposed under the loan will provide opportunities for recent Philippine graduates completing Ph.D. degrees, professors from UPLB and the research staff of the research centers and stations to obtain updating or refresher experience. This will broaden their technological perspective and research breadth in their respective fields of specialization.

The research experience under this phase of the international program may be gained at U.S. universities, international research institutes as CYMMIT, CIAT, AVRDC, and similar public or private research entities. Provisions are also made for defraying the cost of researchers and administrators from the research centers, UPLB campus, and PCARR for attending international seminars, workshops combined with short term observational tours or visits at key institutions within or outside the region. Table C provides more information in regards to special areas of discipline in which training is anticipated.

(2) In-Country Manpower Training

An estimated 237 staff will train in local institutions for the M.S. degree for a total of 476 man-years. A large percentage of this number will attend the graduate school of the University of the Philippines at Los Banos; a small number at the Central Luzon State University and a few other institutions offering graduate courses on the masteral level. Practically, all the allotment of 92 staff for a total of 276 man-years will take Ph.D. courses also at the U.P. at Los Banos. In-country advanced training is justified by the comparatively high quality graduate training available at the U.P. at Los Banos in many disciplines. Added advantages are that the specialization that comes along with graduate

work is undertaken under local environments and the research contributes directly to solving local problems. And, of course, financial-wise, it costs eight to ten times less to train a graduate student in-country than it would be in institutions abroad (Table 4).

c. Field, Laboratory, and Library Equipment

If the national research system is to function effectively in the generation and adaptation of relevant technology on a sustained basis, significant outlays will be needed for field, laboratory, and library equipment and materials. Although the Government of the Philippines has committed substantial funds to the development and operation of the research centers, it does not have sufficient resources to provide all the equipment and facilities necessary to achieve program objectives within a reasonable time frame. Consequently, approximately 28 percent of the loan funds will be used for off-shore procurement of commodities and materials such as those listed in Annex C. This equipment will contribute to the efficient management of the national network of research operations as well as for the conduct of research at the regional centers.

d. Infrastructure

This component represents approximately 50 percent of the loan funds and will be used for partial funding of research laboratories, greenhouses, screenhouses, headhouses, service and processing buildings, experimental farm site development, water supply, sewage, power distribution and staff housing. Tables 5 and 6 show the estimated total funding required to meet the development needs for making the units fully operational as research centers and Table 7 identifies the infrastructure items which have been tentatively selected for funding costs at each of the centers. Annex D gives the itemized costs. Of the total infrastructure needs, approximately 17 percent is for staff housing which is considered absolutely essential in order to attract and retain an increased and competent staff at the outlying centers. Infrastructure will be financed on a Fixed Amount Reimbursement basis. Reimbursement will be made only for completed and fully operational structure of accepted quality for which prior agreement has been arranged relative to design, specifications, number, size, and cost estimates and as defined in sub-project agreements. In no case shall reimbursement from the loan exceed 75 percent of the agreed upon costs for infrastructure development at the centers or stations.

TABLE I

REQUIREMENT FOR SHORT-TERM INTERNATIONAL TECHNICAL ADVISORS
UNDER A.I.D. LOAN II

Particular	: No.	: Total : Man : Months	: Y e a r s					: Estimated : Cost : (\$000)
			: 1	: 2	: 3	: 4	: 5	
1. Research Administration	1	5.0	-	2	1	1	1	40.0
2. Cropping Systems	1	5.0	1	2	2	-	-	40.0
3. Project Evaluation (Loan II)	3	5.0	-	-	2	-	3	40.0
T O T A L	5	15.0	1	4	5	1	4	120.0

Rate: \$8,000 (F59,000) per man-month.

TABLE 2

REQUIREMENT FOR IN-COUNTRY TECHNICAL ADVISORS
UNDER A.I.D. LOAN II

Particular	: No:	Total Man Months	: Y e a r s					Estimated Cost (\$000)
			: 1	: 2	: 3	: 4	: 5	
1. Research Management	1	12	3	3	3	3	-	9.6
2. Experimental Station Management and Development	1	12	3	3	3	3	-	9.6
3. Research Program Development and Execution	10	120	9	40	41	30	-	96.6
4. Experimental Statistics	1	12	3	3	3	3	-	9.6
T O T A L	13	156	18	49	50	39	-	124.8

Rate: \$800 (F6,000) per man-month.

TABLE 3 - INTERNATIONAL TRAINING REQUIREMENTS FOR RESEARCH AND ADMINISTRATIVE STAFF UNDER A.I.D. LOAN II

Particular	Y e a r s					Total No.	Total Man/ Months	Cost * (\$1000)
	1	2	3	4	5			
<u>I. Ph Training Program (Three Years)</u>								
1. Soil and Water		1				1	36	49.5
2. Food Processing and Handling		1				1	36	49.5
3. Microbiology	1					1	36	45.0
4. Crop Improvement	1					1	36	45.0
5. Forestry	1					1	36	45.0
6. Fishery	1					1	36	45.0
7. Animal Science	1					1	36	45.0
TOTAL	5	2	-	-	-	7	252	324.0
<u>II. Upgrading/Refresher for Staff (6-12 Months-Average 9 Mos.)</u>								
1. Crop Improvement	1	1				2	18	40.0
2. Crop Prod. Management	1	1				2	18	40.0
3. Crop Protection	1	1				2	18	40.0
4. Crop Utilization	1	1				2	18	40.0
5. Economics	1	1				2	18	40.0
6. Rural Sociology	1	1				2	18	40.0
7. Soil & Water	1	1				2	18	40.0
8. Crop Physiology	1	1				2	18	40.0
9. Administrative	1	1				2	18	40.0

TABLE 3/2

Particular	Y e a r s					Total No.	Total Man/ Months	Cost * (\$1000)
	1	2	3	4	5			
10. Forest	1	1				2	18	40.0
11. Fishery	2					2	18	37.8
12. Animal Science	2					2	18	37.8
TOTAL	14	10				24	216	475.6

III. Scientific Conf.
Seminars Workshop
Observation
Tours (3-6 Weeks
Average 4 weeks
or 1 Month)

1. Crop Improve- ment	2	2	2	1		7	7	16.6
2. Crop Prod. Management	1	2	2	1		6	6	14.5
3. Crop Protect- ion	1	2	2	1		6	6	14.5
4. Crop Utili- zation	1	2	2	1		6	6	14.5
5. Economics	1	2	1			4	4	9.3
6. Rural Socio- logy	1	1	1	1		4	4	9.6
7. Water & Soil	1	2	2	1		6	6	14.5
8. Crop Physio- logy	1	1	2	1		5	5	12.1
9. Administration	1	2	2			5	5	11.8
10. Forestry	2	2	2	1		7	7	16.6
11. Fishery	2	2	2			8	8	19.2
12. Animal Science	2	2	2			7	7	16.6
TOTAL	16	22	22	11		71	71	169.8
<u>GRAND TOTAL</u>								<u>969.4</u>

*Cost Per Participant per month

Year	Academic (\$)	Non-Academic (\$)
1979	1,100	2,100
1980	1,285	2,350
1981	1,375	2,515
1982	1,470	2,640

TABLE 4

IN-COUNTRY TRAINING REQUIREMENTS UNDER A.I.D. LOAN II
(2 years for M.S.; 3 years for Ph.D.)

Particular	: Y e a r s :					: Total : : No.	: Total : : Man	: Cost : (\$000)
	: 1 : 2 : 3 : 4 : 5 :							
	: 1	: 2	: 3	: 4	: 5			
1. <u>Animal Science</u>								
M.S.	5	5	5	7	-	22	528	70
Ph.D.	3	3	3	-	-	9	324	43
2. <u>Crop Improvement</u>								
M.S.	6	6	4	4	-	20	480	64
Ph.D.	3	2	2	-	-	7	252	33
3. <u>Crop Production</u>								
M.S.	7	7	5	1	-	20	480	64
Ph.D.	4	5	3	-	-	12	432	58
4. <u>Crop Protection</u>								
M.S.	5	5	5	5	-	20	480	64
Ph.D.	4	5	3	-	-	12	432	58
5. <u>Crop Utilization</u>								
M.S.	6	6	4	4	-	20	480	64
Ph.D.	3	2	2	-	-	7	252	33
6. <u>Economics</u>								
M.S.	6	7	7	7	-	27	648	86
Ph.D.	3	3	3	-	-	9	324	43
7. <u>Fisheries</u>								
M.S.	5	5	5	4	-	19	456	60
Ph.D.	2	-	2	-	-	4	144	19
8. <u>Forestry</u>								
M.S.	7	7	7	-	-	21	504	67
Ph.D.	2	2	3	-	-	7	252	33
9. <u>Plant Physiology</u>								
M.S.	5	5	5	-	-	15	360	48
Ph.D.	2	3	2	-	-	7	252	34
10. <u>Rural Sociology</u>								
M.S.	6	6	7	7	-	26	624	83
Ph.D.	2	3	1	-	-	6	216	28
11. <u>Soil and Water</u>								
M.S.	6	7	7	7	-	27	648	86
Ph.D.	3	5	4	-	-	12	432	58
<u>TOTAL</u>								
M.S.	64	66	61	46	-	237	5,688	756
Ph.D.	31	33	28	-	-	92	3,312	440
	95	99	89	46	-	329	9,000	1,196

At the rate of ₦12,000 (\$1,600) per man-year or \$133.33 per man-month.

TABLE 5

ESTIMATED DEVELOPMENT COST OF EIGHT RESEARCH CENTERS AND NATIONAL HEADQUARTERS
UNDER PROPOSED LOAN II SHOWING THE LOAN CONTRIBUTION AND GRP COUNTERPART
(FIVE YEARS)

<u>Project Component</u> (1)	<u>Loan Project Cost</u>		<u>Loan Contribution</u>			<u>GRP Counterpart</u>	
	<u>Amount</u> (2)	<u>% of Total</u> (3) (Million US\$)	<u>Amount</u> (4)	<u>Loan</u> (5)	<u>% of Proj. Cost</u> (6)	<u>Amount</u> (7)	<u>% of Proj. Cost</u> (8)
1. Infrastructure	10.851	26.0	5.002	50.0	12.0	5.849	14.0
2. Equipment (including Library)	2.588	6.2	2.588	26.0	6.2	-	-
3. Manpower Training	2.165	5.2	2.165	21.6	5.2	-	-
4. Operation and Personnel	26.000	62.0	-	-	-	26.000 ^{1/}	62.0
5. Technical Advisors	0.245	0.6	0.245	2.4	0.6	-	-
T O T A L	41.849	100.0	10.000	100.0	24.0	31.849	76.0

^{1/} Of this amount, only \$8.48 million (P63.615 million) or 32% represents new funds in the strict sense of the word. The balance of \$17.8 million (P133.500 million) represents the regular yearly budgetary appropriations for research of the centers/agencies concerned.

TABLE 6

**ESTIMATED COST OF UPGRADING AND DEVELOPING THE RESEARCH CENTERS
COVERED BY THE PROPOSED LOAN II (FIVE YEARS)
(Thousand Dollars)**

RESEARCH CENTERS	I N F R A S T R U C T U R E				EQUIPMENT (INCLUDING LIBRARY)	MANPOWER TRAINING	OPERATION AND PERSONNEL	GRAND TOTAL
	LAB-ORATORY BLDG.	LAND DEVELOPMENT & UTILITIES	STAFF HOUSING	TOTAL				
1. CSST	\$ 723	\$ 300	\$ -	\$ 1,023	\$ 213	\$ 350	\$ 1,264	\$ 2,850
2. IRI	793	894	-	1,687	621	315	13,376	15,999
3. VISCA	814	410	385	1,609	773	350	1,583	4,315
4. USM	404	-	249	653	201	350	1,393	2,597
5. FORI	70	133	339	542	185	200	55,484	6,411
Sub-Total	\$2,804	\$1,737	973	\$ 5,514	\$1,993	\$1,565	\$23,100	\$32,172
1. PNAC	\$ 862	\$ 448	\$ 204	\$ 1,514	\$ 180	\$ 200	\$ 417	\$ 2,311
2. KMSU	469	386	334	1,189	206	200	1,327	2,922
3. CVIT	1,055	332	363	1,750	209	200	1,156	3,315
4. PNHS	-	616	268	884	-	-	-	884
Sub-Total	\$2,386	\$1,782	\$1,169	\$ 5,337	\$ 595	\$ 600	\$ 2,900	\$ 9,432
GRAND TOTAL	\$5,190	\$3,519	\$2,142	\$10,851	\$2,588	\$2,165	\$26,000	\$41,604 ^{1/}

^{1/}Does not include the technical advisory costs estimated at \$245,000.

TABLE 7

INFRASTRUCTURE SELECTED FOR FUNDING AT THE DIFFERENT RESEARCH CENTERS
(In Dollars)

Centers and Structure	: Area : (Sg.M.)	: Unit : Cost	: Estimated : Total Cost
I. <u>CENTRAL LUZON STATE UNIVERSITY</u>			
<u>(CLSU)</u>			
<u>Proposed Loan Financed</u>			
A. Animal Science Research Laboratory	1,500	203	304,500
B. Carabeef Ranch Development and Utilities	-	-	300,000
<u>Sub-Total</u>			<u>604,500</u>
<u>Proposed GRP Financed</u>			
A. Four (4) Corrals and Shed	400	100	40,000
B. Auditorium/Seminar Workshop Building	1,200	281	337,200
C. Feed Bodega	<u>300</u>	<u>137</u>	<u>41,100</u>
<u>Sub-Total</u>			<u>418,300</u>
<u>Total - CLSU</u>			<u>1,022,800</u>
II. <u>UNIVERSITY OF THE PHILIPPINES</u>			
<u>AT LOS BANOS (UPLB)</u>			
<u>Proposed Loan Financed</u>			
A. Gene Bank Building	2,000	266	532,000
B. Experimental Farm Development (IPB)	<u>200 Ha.</u>	<u>3,333</u>	<u>666,667</u>
<u>Sub-Total</u>			<u>1,198,667</u>
<u>Proposed GRP Financed</u>			
A. Experimental Farm Development (CES)	75 Ha.	3,040	228,000
B. Greenhouse	500	150	75,000
C. Screenhouse	500	95	47,500
D. Service-Engineering Building	<u>1,000</u>	<u>138</u>	<u>138,000</u>
<u>Sub-Total</u>			<u>488,500</u>
<u>Total - UPLB</u>			<u>1,687,167</u>

Table 7 . . . Continued

C			
Centers and Structure	Area (Sq M.)	Unit Cost	Estimated Total Cost

**III. VISAYAS STATE COLLEGE OF
AGRICULTURE (VISCA)**

Proposed Loan Financed

A. Crop Research Laboratory	1,200	224	268,800
B. Experimental Farm Development	50 Ha.	2,500	125,000
C. Two Units Greenhouse	432	178	76,896
D. Two Units Screenhouse	432	111	47,952
E. Ten Units 2-BR House	<u>900</u>	<u>169</u>	<u>152,500</u>

Sub-Total

671,148

Proposed GRP Financed

A. Crop Processing and Storage Research Laboratory	500	224	112,000
B. Experimental Pasture	150 Ha.	667	100,000
C. Five Units 3-BR House	650	170	110,500
D. Service Engineering Building	1,000	177	177,000
E. Fertilizer/Chemical Storage	120	162	19,440
F. Feedmill and Bodega	450	162	17,900
G. Seed Storage Room	20	162	3,240
H. Headhouse	350	186	65,100
I. Three Units 4-DR Apt.	900	135	121,500
J. Duck Shed	175	100	17,500
K. Cattle Shed	175	100	17,500
L. Housing Area Development	10 Ha.	6,750	67,500
M. Water Reservoir	2 Ha.	16,750	33,500
N. Water Supply System Improvement	<u>-</u>	<u>-</u>	<u>75,000</u>

Sub-Total

937,680

Total - VISCA

1,608,828

**IV. UNIVERSITY OF SOUTHERN MINDANAO
(USM)**

Proposed Loan Financed

A. Greenhouse	216	165	35,640
B. Screenhouse	216	107	23,248
C. Ten Units 2-BR House	<u>900</u>	<u>161</u>	<u>144,900</u>

Sub-Total

203,788

Table 7. . . . Continued

<u>Centers and Structure</u>	: Area : (Sq. M.)	: Unit : Cost	: Estimated : Total Cost
<u>Proposed GRP Financed</u>			
A. Five Units 3-BR House	650	161	104,650
B. Auditorium/Seminar Workshop Building	<u>1,200</u>	<u>278</u>	<u>344,400</u>
<u>Sub-Total</u>			<u>449,050</u>
<u>Total - USM</u>			<u>652,838</u>
 <u>V. FOREST RESEARCH INSTITUTE (FORI)</u>			
<u>Proposed Loan Financed</u>			
A. Two Units Greenhouse	432	162	69,849
B. Water Supply System Improvement	<u>2,000</u>	<u>66</u>	<u>133,333</u>
<u>Sub-Total</u>			<u>203,182</u>
<u>Proposed GRP Financed</u>			
A. Ten Units 3-BR House	1,300	150	195,000
B. Laborers Quarters	100	117	11,700
C. Four Units 4-DR Apt.	<u>1,200</u>	<u>110</u>	<u>132,000</u>
<u>Sub-Total</u>			<u>338,700</u>
<u>Total - FORI</u>			<u>541,882</u>
 <u>Total for First Five (5) Centers</u> <u>(CLSU, UPLB, VISCA, USM, FORI)</u>			
<u>Proposed Loan Financed</u>			<u>2,881,285</u>
<u>Proposed GRP Financed</u>			<u>2,632,230</u>
 <u>VI. PALAWAN NATIONAL AGRICULTURAL</u> <u>COLLEGE (PNAC)</u>			
<u>Proposed Loan Financed</u>			
A. Crop Research Laboratory	1,500	241	360,952
B. Experimental Farm Development	50 Ha.	2,700	135,000
C. Greenhouse	216	192	41,472
D. Screenhouse	216	117	25,288
E. Water Supply System	-	-	77,335
F. Power Distribution System Improvement	<u>-</u>	<u>-</u>	<u>200,000</u>
<u>Sub-Total</u>			<u>840,047</u>

Table 7 . . . Continued

<u>Centers and Structure</u>	: Area : (Sq. M.)	: Unit : Cost	: Estimated : Total Cost
<u>Proposed GRP Financed</u>			
A. Two Units 3-BR House	260	180	46,800
B. Physical Plant Compound	2,000	200	400,000
C. Two Units 4-DR Apt.	600	145	87,000
D. Guesthouse	370	190	70,300
E. Housing Area Development	5 Ha.	7,200	36,000
F. Farm Building and Structure	-	-	34,000
			<u>674,100</u>
			<u>Total - PNAC</u>
			<u>1,514,147</u>

VII. MARIANO MARCOS STATE UNIVERSITY
(MMSU)

<u>Proposed Loan Financed</u>			
A. Crop Research Laboratory	1,500	208	312,000
B. Experimental Farm Development	50	2,300	115,000
C. Greenhouse	216	165	35,640
D. Screenhouse	216	108	23,248
E. Eight Units 2-BR House	720	163	117,360
			<u>603,248</u>

<u>Proposed GRP Financed</u>			
A. Two Units 3-BR House	260	165	42,900
B. Seed Storage Room	20	150	3,000
C. Headhouse	520	182	95,160
D. Three Units 4-DR Apt.	900	125	112,500
E. Guesthouse	370	165	61,050
F. Housing Area Development	5 Ha.	6,320	31,600
G. Water Supply System Improvement	-	-	90,000
H. Power Distribution System Improvement	-	-	150,000
			<u>586,210</u>
			<u>Total - MMSU</u>
			<u>1,189,458</u>

VIII. CAGAYAN VALLEY INSTITUTE OF
TECHNOLOGY (CVIT)

<u>Proposed Loan Financed</u>			
A. Crop Research Laboratory	1,500	206	309,532
B. Experimental Farm Development	50 Ha.	2,300	115,000

Table 7 . . . Continued

<u>Centers and Structure</u>	: Area : : (Sq. M.) :	: Unit : : Cost :	: Estimated : : Total Cost :
C. Greenhouse	216	165	35,640
D. Screenhouse	216	105	22,748
E. Two Units 3-BR House	260	165	42,900
F. Water Supply System Improvement	-	-	100,000
G. Power Distribution Improvement	-	-	51,600
<u>Sub-Total</u>			<u>677,420</u>
<u>Proposed GRP Financed</u>			
A. Greenhouse	160	165	26,400
B. Ten Units 2-BR House	900	164	147,600
C. Service-Engineering Building	1,000	164	164,000
D. Fertilizer/Chemical Storage	120	150	18,000
E. Seed Storage Room	20	150	3,000
F. Animal Research Laboratory	1,200	206	247,200
G. Forage Research Laboratory	350	206	72,100
H. Forestry Research Laboratory	300	206	61,800
I. Headhouse	520	183	95,160
J. Three Units 4-DR Apt.	900	124	111,600
K. Guesthouse	370	164	60,680
L. Housing Area Development	5 Ha.	6,290	31,450
M. Water Reservoir	2 Ha.	16,550	33,100
<u>Sub-Total</u>			<u>1,072,090</u>
<u>Total - CVIT</u>			<u>1,749,510</u>
 <u>IX. PCARR NATIONAL HEADQUARTERS AND SECRETARIAT (PNHS)</u>			
<u>Proposed GRP Financed</u>			
A. Twelve Units 3-BR House	1,560	150	234,000
B. Ten Units 4-DR Apt.	3,000	110	330,000
C. One Guesthouse	370	141	52,170
D. Housing Area Development	5 Ha.	5,600	28,000
E. Water Supply Improvement	-	-	90,000
F. Power Distribution System	-	-	150,000
<u>Total - PNHS</u>			<u>884,170</u>

Table 7 . . . Continued

<u>Centers and Structure</u>	<u>:</u>	<u>Area</u>	<u>:</u>	<u>Unit</u>	<u>:</u>	<u>Estimated</u>
	<u>:</u>	<u>(Sq. M.)</u>	<u>:</u>	<u>Cost</u>	<u>:</u>	<u>Total Cost</u>
<u>Total for the Last Four (4) Centers</u>						
<u>(PNAC, MSU, CVIT, PNHS)</u>						
<u>Proposed Loan Financed</u>						<u>2,120,715</u>
<u>Proposed GRP Financed</u>						<u>3,216,570</u>
<u>GRAND TOTAL (FOR NINE (9) CENTERS)</u>						
<u>Proposed Loan Financed</u>						<u>5,002,000</u>
<u>Proposed GRP Financed</u>						<u>5,848,800</u>

2. Project Outputs

The outputs from this activity will be five national and three regional research centers fully staffed and sufficiently equipped to be operational, developing and verifying research results relevant to the needs of small farmers in each of the target zones. In addition, an information retrieval system and scientific literature service will be functioning, providing a flow of research information and data from the national reference center to researchers in the field as well as a return flow of research results from the research centers and stations to the national data bank. The national information retrieval system is a cooperative effort servicing PCARR, IIRI and SEARCA and will collaborate with the Agricultural Information Society for Asia and the Current Agricultural Research Information System (CARIS), the global project of the FAO. (Refer to Annex E.)

One of the major outputs will be a significant increase in the quantity and quality of research personnel available for research in the various regions. Recognizing that research facilities are absolutely essential if meaningful research is to be performed, it is equally crucial that competent researchers be available to utilize the facilities. It is estimated that this component will provide 237 personnel with M.S. degree; 99 with Ph.D's and 95 an opportunity for refresher and upgrading experience through short term training. Especially significant is the fact that the great majority of the academic training will be pursued in-country.

Seven of the eight centers to be assisted by the loan are agricultural colleges/universities. The improved research capability developed will doubtless improve the quality of teaching and extension service in these institutions. Research centers will also enhance their capability to attract and retain top quality staff.

Development of the research centers will contribute to solidifying PCARR's position of leadership in determining research priorities as well as for coordinating, programming, and evaluating agricultural research efforts by all relevant GRP entities. It will also contribute to attracting increased cooperative efforts from commodity research organizations, both in-country and international.

The successful achievement of the proposed outputs will result in a continuous flow of research information and improved technology from the regional and national centers to the small farmers. The relevance of the research to national and regional priority goals

is assured through the organizational arrangement implemented by the GRP in the form of PCARR. Composition of the three bodies making up PCARR includes representative ranging from small farmers through the academic and technical levels to top policy makers. (See Annex F.) This composite membership also ensures that research efforts will be in harmony with the national agricultural development goals of national self-sufficiency in key agricultural commodities, increased productivity and increased income of small farmers.

Although PCARR is not responsible for the GRP extension service, to ensure that the results of research are disseminated PCARR has established an outreach program aimed at maximizing the sharing of information at the regional, national and international levels and has organized strong linkages with extension agencies and the mass media. To keep them fully informed on the latest technology available, PCARR publishes a series of semi-technical bulletins entitled "The Philippines Recommends" for each commodity, the monthly publication "PCARR Monitor," and the weekly "PCARR Farm News" which is provided the Rural Broadcasters Council having approximately one hundred radio outlets throughout the country. For the mass media, it regularly prepares press and TV releases, special farm radio news and feature articles for magazines. Feedback is strongly encouraged in all publications. A corps of Subject Matter Specialists have been identified to provide the vital link between researchers and information users such as extension agents, teachers, farmers, salesmen and other action agencies. The subject matter specialists translate research data into bulletins and other more useable forms. In addition, linkage conferences with extension and other end-users are conducted annually and field testing with farmers is practiced. PCARR has initiated the institutionalization of the working relationship of the concerned agencies in (a) technology generation, (b) technology dissemination, and (c) technology dissemination (Annex G).

The organization of the research centers from among existing government stations with degrees of research capability will provide stronger research backstopping to the economic development of the regions. This is particularly so with the present system whereby research thrusts are geared to the more pressing problems of the commodity industries in the regions as identified at joint action meetings by multi-sectoral groups composed of researchers, extension men, personnel industry representatives, teachers, policy-makers, etc. Having an active role in the action groups are the NEDA regional directors who provide leadership toward integrated economic planning.

The GRP has demonstrated concern for small farmers by institutionalizing a comprehensive system for supplying credit, other inputs and marketing assistance to small farmers. The credit program for rice and corn farmers has reached in excess of 800,000 small producers. Other positive actions have included price supports for products principally produced by small farmers. It is assumed that the policies such as credit, price supports and providing special agents on the part of the GRP to help small farmers increase production will continue.

3. End-of-Project Status

The following situations will indicate attainment of the project purpose by the end of the A.I.D. inputs and the corresponding GRP counterpart resource support. (Please refer to Annex E.)

- a. PCARR Secretariat will be fully staffed and operational with increasing effectiveness in providing the leadership needed in maximizing the impact of the research effort on the nation's economic growth, including policy formulation and evaluation and identification of major constraints to increased production.
- b. The eight research centers sufficiently staffed and equipped to provide the research backstopping to regional development.
- c. The research effort much more responsive to the solution of the more pressing problems of the small farmers, including the development of relevant alternative cropping systems.
- d. Faster local adaptation of technology from international research institutes/centers to supplement the indigenous technology generated in the national research system.
- e. A fully operational information retrieval and dissemination system established for the national research system in cooperation with other research organizations like UPLB, IRRI, SEARCA and SEAFDEC.
- f. Faster flow of information to the farming areas and the needed feedback of farm problems to the researchers.
- g. Closer and more effective interaction of the research and extension services resulting in faster farm adaptation of research findings.
- h. More intensified research orientation on the part of agricultural colleges, the principal ones of which are

participants in the PCARR research station network, and its reinforcing influence on the teaching and extension functions of these institutions.

Achievement of these end-of-project goals presupposes the Philippine Government's continuing support for an integrated national research system geared to the solution of clearly identified priority problems of the agricultural sector. Past government support in the establishment of the Rodent Research Center, National Crop Protection Center, Institute of Plant Breeding and its interest in the acquisition of the first A.I.D. agricultural research loan and this follow-up loan as high agricultural priority actions, all attest to the government policy of providing the needed support to assure attainment of the project goals.

Part III. Project Analysis

A. Technical Analysis Including Environmental Assessment

The critical role played by research in the challenge to grow more food and in the overall development process is now widely recognized. Mosher (1966) in his book "Getting Agriculture Moving" identified technology changes, a product of research, as an essential element for agricultural development. The dramatic benefits realized from increased rice and wheat production during the past decade originated in great part from intensive, multi-disciplinary research conducted at IRRI and CIMMYT respectively.

Schultz (1975)^{1/} stated that, "advances in the agricultural sciences are one of the necessary conditions for agriculture to succeed as the primary supplier of food." He went on to point out that, "In the allocation of resources, agricultural research is an investment in future returns--research capital formation -- banks of genetic materials, laboratory facilities, experimental fields and plots, equipment and various mixes of scientific skills or scholarly capital."

Mellor (1975)^{2/} emphasized the need for research in his statements, "To overcome the diminishing returns of traditional agriculture and to support employment oriented growth strategies, science and technology systems must be built. The increasing societal needs and demands for agricultural research lends urgency to achieving efficient allocation of scarce research personnel and institutional resources. The scarcity also requires that attention be given to organizing and conducting research to expand research capacity. This need for expansion results in part from past failures to recognize the importance of agricultural research and past and present deficiencies in agricultural training. Thus a current objective of research programs must be to make their own growth self-sustaining through developing their own personnel and institutional resources. The resources to be allocated are the physical plant, trained personnel and, most important, the institutional structure into which plant and personnel are organized for a productive purpose. So little is known of how to prepare competent personnel and how to build institutions that the most effective way to promote growth in the research resource base is almost certainly through developing the research structure itself."

^{1/} Schultz, T.W., "The Uneven Prospects for Gains from A Agricultural Research Related to Economic Policy." Reprint 18, CIMMYT, 1975.

^{2/} Mellor, J. W., "Technology to Increase Food Production," paper presented at - Seminar: World Hunger, National Academy of Science, Washington, D.C.

The National Research Council of the National Academy of Sciences in their report entitled "World Food and Nutrition Study" (1977), made at the request of President of the United States and involving contributions from approximately 1500 scientists and administrators, recommended that AID, in the area of food production,---have a larger and more systematic effort ---to help the developing countries establish research and development capabilities for food and nutrition in both the natural and social sciences and---a larger and better designed AID effort to train research personnel for developing countries.

Studies and experiences in many areas of the world have demonstrated that the pay-off to investments in agricultural research is extraordinarily high. Evenson (1973)^{3/} cited internal rates of return to investments in research that ranged from 21 to 91 percent and that usually twice, perhaps three times, as much growth is purchased with research dollars than with other program dollars (additional details are presented in Section D, Economic Analysis).

Evenson's analysis of the productivity growth in food grain production in Asia and the Middle East demonstrated that indigenous research systems accounted for 40 percent of the productivity growth whereas technology transfer from other national systems in similar climatic zones provided 35 percent and international institutions accounted for 25 percent. The results also revealed that an indigenous capability in national systems is essential in order to effectively use borrowed or transferred technology. Additionally, that the transfer of technology from temperate to tropical zones was minimal in most situations.

Hence, two important conclusions may be drawn from recent studies and experience:

- (1) it pays to invest in research and
- (2) a strong national agricultural research system is essential if technology is to be borrowed or developed for increasing agricultural productivity.

In view of the studies and data available, it is surprising that an optimal investment program in agricultural research systems has not been more widely undertaken. Boyce and Evenson

^{3/} Evenson, R.E., "Investment in Agricultural Research," prepared for the Consultative Group in International Research, Yale University, 1973.

(1975)^{4/} cite the reasons for this failure as due to: (1) the very limited supply of research skills previously available and, (2) major errors in judging expected benefits from alternative investments on the part of policy makers. They concluded that "the rise of economic planning and emergence of an international bureaucracy has led to a strong policy bias in favor of projects thought to offer quick results, leading policy makers to err in believing that improved technology was a simple matter of importing it. That policy position has worked against adequately investing in research systems. Now, after considerable investment and experience with that strategy, its basic shortcomings have become obvious."

The Government of the Philippines recognized the lack of and the need for an effective research system following an in-depth review of their system in 1971. As a result, the Philippine Council for Agricultural Research was established by Presidential Decree on November 10, 1972. On December 29, 1975, the decree was amended to include natural resources and the name modified to the Philippine Council for Agriculture and Resources Research (PCARR).

PCARR was established in order to develop a coordinated, intensified and more relevant agricultural research system that would be responsive to the needs of farmers while maximizing the benefits from limited resources. For more details see Annex F.

The Government of the Philippines and PCARR recognize that as agricultural development intensifies, so does the need for more adequately trained manpower to staff essential services as well as to provide training for those who follow.

That the lack of well trained manpower is a serious impediment to developing a viable self-sustaining science based agriculture has been identified by many authorities, both individuals and groups. The U.S. National Academy of Science task force recommended that the shortage of well trained technical personnel should receive explicit recognition within each developing area and that an adequate cadre of trained people, institutional resources and other means to sustain an on-going indigenous research and development program be a part of each development effort. This need was echoed by J. A. Rigney and

^{4/} Boyce, J.K. and Evenson, R.E., "Agricultural Research and Extension Programs," Chapter 6, Agricultural Development Council, Inc., 1975.

R.W. Cummins^{5/} when they pointed out that the education of professional agriculturists and the development of indigenous agricultural research capability in the early stages of development deserve high priority in the allocation of scarce resources since the effectiveness of agricultural extension and public service programs can rise no higher than the level of available locally adapted agricultural technology and the supply of professionally trained research workers to develop the technology."

The list of authorities recognizing the serious shortage of adequately trained manpower could be greatly amplified but it is widely acknowledged that development is fundamentally the development of people at all levels since it is people that make policies, plan, teach, research and produce or fail to produce crops and animals. If developing areas are to become self-sustaining, they must develop an in-country capability to conduct multidisciplinary research that will maintain a sustained flow to the farmer of new technological inputs. To develop and maintain a capability in multidisciplinary research, they must also develop an indigenous capacity to train adequate numbers of professional at competent levels. Any research and training program is only as good as the staff involved, which must be highly trained and well motivated. It is unrealistic to expect that students trained through the B.S. level should be effective researchers as the training in conceptualizing and organizing an investigation is largely acquired at the M.S. and Ph.D. level of training. Likewise, as research moves to solve more difficult second generation problems, greater in-depth training becomes more essential. The difficulty of the research tasks faced in the tropics, both in biological as well as social-economic problems, are as complex if not more so than in the temperate zones. Hence, at least an equal competence is needed to resolve them.

The manpower training scheduled within this loan was determined from a detailed manpower survey conducted by PCARR in 1975. The survey ascertained the needs to service the identified research network and compared it to the actual number of personnel available within the system. The survey revealed there were 1,557 staff with B.S. degrees, 331 with Masters and 146 with Ph.D.'s to service the nationwide needs of research in agriculture, forestry and fisheries. These personnel are distributed within the Ministry of Agriculture, Ministry of Natural Resources, the National Science Development Board, Universities and Colleges,

^{5/} Rigney, J.A. and Cummings, R.W., "A Report on The Asian Agricultural College and University Seminar," North Carolina University, 1970.

and other government and semi-government institutions. Of the total, 76.5 percent have B.S. degree training, 16.4 percent have M.S. degrees and 7.1 percent have Ph.D.'s, 5.6 percent (78.8 of the Ph.D.'s) were found within the colleges and universities. Of the total, approximately 85 percent of the Ph.D.'s and 66 percent of the M.S. degrees were within Region 4 which include Greater Manila and Laguna, the locations of the principal centers of the University of the Philippines, emphasizing that the concentration of the better trained researchers are within the major university system and the scarcity of research personnel to service the widely varied regional needs.

The survey revealed that university research personnel devote 49 percent of their time to research and researchers in other entities 77 percent of their time. Therefore, the analysis was converted to a basis of Science-Man-Years (SMY), showing the following situation:

<u>Level of Training</u>	<u>Ph.D.</u>	<u>M.S.</u>	<u>B.S.</u>
Manpower required to service the research network (SMY)	395	994	1044
Manpower available (SMY)	82	137	654
Shortage (SMY)	313	857	399
Shortage in actual number of individuals	514	1356	888

An appreciation of the significance of research manpower may be developed noting the following comparative data between the Philippines and the U.S.

	<u>Philippines</u>	<u>U.S.</u>
Number of farm units	2.4 million	2.7 million
Research personnel-SMY	864 ^{6/}	10,330
Research personnel-SMY/farm	1:1874	1:266

6/ The 864 represent research personnel expressed in Science Man Year to service agriculture, forestry and fisheries within the Philippines whereas the 10,330 in the U.S. are engaged only in agriculture research. Equally relevant, over one-half of the agricultural research in the U.S. is conducted by the private sector. Also, within the Philippine data, only 7.1 percent have Ph.D.'s whereas in the U.S. approximately 71 percent have doctoral degree.

It is recognized that the new technology developed through research is of minimum utility unless it effectively reaches and stimulates the small farmer. To accomplish this end, it is necessary to train those who develop and extend the new technology. The proposed activity will provide training opportunities for approximately 650 man-years of education directed to development and transfer of improved technology. Those trained will not only aid in solving current research problems but also offer the added feature of favorably influencing research needs within the next two to three decades and more. Since most of the regional centers include agricultural colleges (Table 8), the benefits to be derived from improved infrastructure, laboratory and field equipment and especially improved library facilities will be multiplied through better trained students.

Table 8 - Agricultural Research Centers Involving Agricultural Colleges

<u>Center</u>	<u>Agricultural Colleges</u>
A. <u>Multi-Commodity National Research Centers</u>	
1. Central Luzon State University	CLSU College of Agriculture
2. University of the Philippines at Los Baños	UPLB College of Agriculture UPLB College of Forestry Institute of Agricultural Engineering and Technology Land Reform Institute Agricultural Credit and Cooperative Institute
3. Visayas State College of Agriculture	Visayas State College of Agriculture
4. University of Southern Mindanao	USM College of Agriculture
B. <u>Single Commodity Research Centers</u>	
1. Philippine Tobacco Research and Training Center	Mariano Marcos State University (mother agency)

- | | |
|---------------------------------|----------------------------|
| 2. Forest Research Institute | Located at UPLB, Los Banos |
| 3. Philippine Sugar Commission | Diliman, Quezon City |
| 4. Philippine Coconut Authority | Diliman, Quezon City |

C. Regional Research Centers

- | | |
|---|--|
| 1. Mariano Marcos State University | College of Agriculture |
| 2. Cagayan Valley Institute of Technology | Cagayan Valley Institute |
| 3. Mountain State Agricultural College | Mountain State Agricultural College |
| 4. Bicol Rice and Corn Experiment Station | Camarines Sur Agricultural College
Bicol University College of Agriculture
BU College of Fisheries
(with formal working relationship) |
| 5. Palawan National Agricultural College | Palawan National Agricultural College |
| 6. La Granja Experiment Station (BPI) | - |
| 7. Central Mindanao University | CMU College of Agriculture |
| 8. Davao Experiment Station (BPI) | - |

Since many researchers have teaching responsibilities within the colleges, the training of staff will make a significant impact on their students and in turn multiply the long term contribution to improving the agricultural sector. It is doubtful that any input will produce greater long term returns on investment in a society dominated by agriculture than a pool of highly qualified agricultural scientists. The training component makes double use of the investment. Obviously there remains a serious need for highly trained personnel if the Government of the Philippines is to mount a viable research system to service the rural needs.

The great majority of the proposed academic training will be carried out within the Philippines, principally at the UPLB. This position is compatible with the concept of developing a self-sustaining capability as well as maximizing returns to investment since approximately 8 to 10 scholars can be trained in-country for the cost of one trained in the United States.

Training within the culture and the environment also can better prepare individuals for resolving the needs of the country. Thesis research and studies can be focused upon immediate problems, contributing to the advancement of local science, to the generation of site specific technology and to development of commitments to local problems. A small number of scholars will be trained at the Ph.D. level abroad to fill specialized needs that cannot presently be adequately offered within the Philippines.

In addition to addressing the critical manpower component, PCARR has recognized the necessity for developing regional centers to service the needs of farmers in widely varying ecological zones. This concept is in harmony with a number of authorities who have recently reported that if new technology is to be relevant, it must be more site specific than previously believed. Increasingly, it is recognized that the factors now limiting increased productivity are so disparate and complex as to make it unlikely that new single component inputs such as the early plant releases by IRRI and CIMMYT can repeat those successes that commanded such wide attention a decade past. Second generation problems involving new bio-types of pests, post harvest loss increases as a result of increased production, local substitutes or modifications to ameliorate the impact of increased costs of energy and energy based inputs, these and many more all demand different solutions or adaptations in order to be relevant for farmers in different zones. There is for example a considerable body of literature on "genotype - environment interactions" in both plant and animal sciences which demonstrate their importance in improved performance. It is well known that a given plant variety does not perform equally well in different soil, water and temperature environments. Although crop improvement research has partially overcome such impediments, genotype - environmental interactions still dictate that efficient production requires that technology be tailored to specific "target" environments. The research network of regional centers and cooperating testing stations will provide the means of addressing the site specific needs of the various regions within the Philippines.

PCARR, as the focal point for coordinating national research in agriculture, forestry, fisheries and natural resources, has recognized the need for efficiently use the limited research

resources available as well as to bridge the gap between researchers and farmers. The organizational system developed (Annex F) ensures that all research proposals are screened to see that they contribute to regional and national development priorities and these priorities are biased in favor of small farmers.

The research priorities have been developed in cooperation with the National Economic Development Authority (NEDA). In 1976, PCARR conducted eight regional research congresses and a national research congress in order to update the regional research priority programs for each of the thirteen regions. The collective inputs of 50 national and 900 regional participants representing the private sector, government agencies and research/educational institutions identified regional problems on a commodity basis, established priority areas and evolved a priority list of research for each geographic area in order to ensure that the research was relevant to farmers in the target zones as well as the overall goals of development set forth by the Government of the Philippines (see Annex H).

The research priorities focus attention upon food crops, aquaculture, reforestation and watershed protection with strong emphasis given to cropping systems within the crops sector. However, the need for increasing diversification in order to broaden the base of production was identified. As a result, attention will be given to reducing livestock losses, tree crops such as coconuts and other non-food crops produced by small farmers. Non-biological dimensions of the problems requiring research will be identified and analyzed in order to minimize problems in income disparity and to temper the social impact of development.

New technology developed as a result of this loan will provide the opportunity to increase production on areas of limited land. Since the available arable land is virtually all under cultivation at the present time, increased yields per hectare represent the only rational long term solution to more food production and this goal must be achieved through the application of improved technology. Indeed, the role of the small farmer will become even more important in years ahead as population pressure increases since the bulk of the basic food production is derived from small holdings. To feed an increased population, forecast to double in the next 25 years, at present intake levels, the available food supply must double. Recognizing the present 15 percent deficit in caloric intake per capita (Table 9) food production would have to more than double to meet the recommended nutritional level. Experience from many parts of the world indicate that such increases cannot be realized

without an intensive research program aimed at developing higher yielding varieties that are resistant to the most destructive diseases and pests, early maturing to permit multiple cropping and tailored to location specific ecological zones. Over the longer term, increased production and crop diversification should lower the requirement for importing food and feedgrains.

Table 9

Mean Daily Per Capita Nutrient Intakes
Compared to Recommended Daily Allowances
in Nine Regions of the Philippines, 1958-1969*

	Intake**	RDA	% Adequacy
Calories	1671	2000	84
Protein, GM	46.2	48.9	95
Calcium, GM	.34	.56	61
Vitamin, A, IU	1812	4064	45
Riboflavin, MG	.47	1.03	46
Thiamine, MG	.73	1.03	71
Niacin, MG	.14	13	108
Ascorbic Acid, MG	67	69	97

Increased irrigation and more efficient water use, objectives sought under another project, (Small Scale Irrigation) will enable farmers to produce crops throughout the year, but it will intensify management problems for the farmers. These problems will be addressed in the research program of improved cropping systems so as to enable the small producer to achieve increased production throughout the year. This does not imply that only the farmer with irrigation will benefit from the research. The small farmer, utilizing rainfed conditions will also benefit from research that

*Source: C. VC Barba, 1976, The Food and Nutrition Situation in the Philippines.

**Food and Nutrition Research Institute, 1975.

demonstrates he may double crop and pursue other management techniques to increase his production. For example, early maturing varieties of rice, developed through research, hold promise of permitting double cropping under rainfed conditions if the first crop is direct seeded, followed by a second crop planted by the normal practice of transplanting. The same practice of direct seeding rice may permit a second crop of sorghum or other food-feed crop. Another promising practice is the interplanting of new sugarcane with rice, soybeans, peanuts or mungbeans, thus obtaining an additional crop during the period of establishing the cane. These practices would not be possible without research, As to small farmers being capable and likely to utilize the benefits from research, evidence of recent years indicates they are capable and highly likely to apply the results.

Primary responsibility for transferring research findings into action programs by small farmers is given to the Bureau of Agricultural Extension of the Ministry of Agriculture which appears to have been effective in the recent Masagana rice program for small farmers. Other extension workers such as those of the Bureau of Plant Industry, Soils, Credit technicians and private firms also transmit new technology to small farmers. As an example, the Masagana 99 rice program which started in 1973 effectively taught small farmers how to apply the full "High Yielding Variety" technology including all the inputs required, and where applied raised the average yield of rice by about 33 percent albeit benefiting from favorable weather. The same principles and the systems established can in turn be applied to other food crops.

The spread of high yielding rice varieties illustrates the susceptibility of the small Filipino farmer to new technology. At the time IR-26 was released in 1973, the Ministry of Agriculture actively encouraged farmers to use this variety to counteract an acute outbreak of brown planthoppers and grassy stunt, a virus disease, to which IR-26 is resistant. Two thousand, one kilogram kits were distributed to farmers in seriously affected areas plus, 9.8 metric tons of seed provided by the Bureau of Plant Industry for multiplication in their stations and with selected growers. As a result of this effort, within 12 months, there was more than enough seed to plant all of the 1975 dry season crop of 500,000 hectares.

In short, the GRP has demonstrated the ability to spread new technology to farmers. The farmers in turn reacted positively to new technology that met their immediate needs. Finally, a superb performance yieldwise of the new variety made IR-26 an unqualified success only 15 months after its release from IRRI.

PCARR recognizes the need to bridge the gap between researchers and farmers. To see that research results move to farmers as rapidly as possible, they have developed an outreach program utilizing the conventional methods of field testing results with farmers, subject matter specialists to convert research results into more readily usable forms, nationwide radio and limited TV coverage addressed to the rural population and improved communications between all agricultural workers via seminars, workshops and publications. However, to accelerate acceptance of technology, they are evolving a mechanism whereby the researchers will involve farm leaders in the conduct and demonstration of applied research as well as providing researchers with a greater sensitivity to the problems of small farmers. A more detailed explanation is provided in Annex G.

In that food constitutes 54 percent of consumer expenditures, increased production and improved productivity accompanied by improved marketing which is being addressed in the Integrated Agricultural Production and Marketing Project, offer the best options for making more food available at a lower cost.

Establishment of the regional research centers in conjunction with this loan complements activities supported by the Integrated Agricultural Production and Marketing (IAPM) project. Research connected with the IAPM project will be essentially limited to development of technological packages at the Central Luzon State University (CLSU) at Munoz, Nueva Ecija. This is also the site of one of the PCARR multi-commodity national agricultural research centers supported under the first agricultural research loan and further strengthened under this second loan. Having a regional PCARR center at the CLSU campus minimizes duplication of research efforts in the region. Packages of technology prepared at CLSU under the IAPM project will be made available to the PCARR research network for testing and further modifications as necessary, to fit Philippine ecological zones in other regions. AID is providing loan assistance for a system of institutions to improve pest control measures for food crops. It includes a National Crop Protection Center (NCPC) and seven regional centers (four supported by the loan) which will conduct research on pest control and undertake related training and extension activities. Three of the regional centers for crop protection will be associated with PCARR research centers, and two will be associated with college campuses. Cooperative efforts among the various research and educational facilities within each geographic area will minimize duplication of effort and greatly strengthen the effectiveness of each facility. PCARR is empowered with the responsibilities of coordinating all research within the country in the areas of

agriculture and natural resources, including crop protection. To assure coordination between PCARR and the research activities of the Centers, the Director of the Crops Research Division of PCARR has been appointed as a member of the advisory board of the NCPC. Other relationships between PCARR and the Centers will be detailed in a memorandum of understanding between PCARR, BPI, and the NCPC. Proposals for additional research grants (above the normal funding channels of the Centers) from PCARR to the Centers will follow the usual PCARR processes of review.

Relevant to the interest of the AID, a number of the centrally funded research programs focused upon key problems areas involve cooperation of the GRP research entities coordinated by PCARR, Thus, indicating to some degree, recognition of PCARR's technical and management capability to administer agricultural research.

As to the capability of PCARR to effectively implement development of the research network, they have, in the relatively brief period since being organized recruited a competent nucleus staff; established 32 multi-disciplinary national commodity research teams; outlined a national development program; conducted a detailed manpower survey; identified a national network of research centers and cooperating stations; established an evaluation and monitoring system; inventoried existing research resources (equipment, infrastructure, budgets); established a grants-in-aid program for supporting priority research; and developed an outreach and communications program.

As a result of experience gained in coordinating development of research efforts of regional entities, PCARR has recently adopted development master planning which integrates research with educational development with educational institutions affiliated with the regional research centers. This new concept recognizes the need and desirability of integrating research capability with educational development. Toward this objective, PCARR is working closely with the Educational Project Implementation Development Task Force (EDPITAF) so their efforts complement each other, as well as avoiding duplication of investments.

In view of the relatively brief life span of PCARR and its innovative approach to developing an efficient agricultural research system, progress has been excellent. It is evident that attitudinal changes among workers in agricultural development are occurring. Increased cooperation is becoming more common and researchers are recognizing that research is not the end of their efforts but rather the target beneficiary--the farmer. Also, they have become aware that there exists a system of linkages

between them and the producer, represented by extension and various media, that are essential if research results are to be of value.

Relative to the impact of this activity upon the environment, the results of the proposed research will in almost all aspects, contribute to improvement of the environment. The Initial Environmental Examination providing for a negative determination has been approved (Annex J).

In summary, the activities supported in part by this loan are highly appropriate and in harmony with the goals of the Government of the Philippines and the objectives of AID assistance efforts. There is every reason to be optimistic that the research development activities planned will result in more efficient use of resources, will represent an excellent investment and will contribute to finding both near and long term solutions to the Philippines' pressing development problems in agriculture and food production.

B. Financial Analysis and Plan

The program developed by the GRP for improvement of facilities and the expansion of more effective and efficient research programs at the selected centers under consideration proposes the following estimated expenditures over a five-year period:

	<u>Development Cost</u>	<u>U.S. Loan Contribution</u>
1. Infrastructure	\$ 10,851,000	\$ 5,002,000
2. Equipment	2,588,000	2,588,000
3. Manpower	2,165,000	2,165,000
4. Consultants	245,000	245,000
5. Operations including Professional Services	<u>26,000,000</u>	<u>-</u>
	\$ 41,849,000	\$10,000,000

A large proportion of the total expenditure will occur during the first three years of the project, i.e. \$8.22 and \$2.59 million for infrastructure and equipment respectively as well as a significant portion (\$1.39 million) for manpower development. Table 10 summarizes the total estimated project cost at the selected centers for a five-year period and the U.S. contribution which in no case will exceed \$10 million as proposed in the PRP. The estimates indicate that of the base capital development costs of approximately \$15.85 million, the proposed loan would support 63 percent and GRP contribution 37 percent. Of the total estimated costs of \$41.85 million over the five-year period, including research support operations, the loan would contribute approximately 24 percent and the GRP 76 percent. Within the infrastructure, the loan funds will support 46 percent and the GRP 54 percent of the total estimated costs. Infrastructure development includes crop research laboratories, greenhouses, screenhouses, staff housing, farm development, service buildings, headhouses and utilities.

The infrastructure component is approximately 50 percent of the loan; however, it is 26 percent of total project cost. The implementation period for this component is five years, with the loan share being completed during the first four years.

The loan contribution for equipment, including libraries, will cover 100 percent of the project cost for this particular component; however, it is about 25 percent of the loan. The allocation for

TABLE 10 - SUMMARY OF PROJECT COST OF THE EIGHT AGRICULTURAL RESEARCH CENTERS AND ECARR HEADQUARTERS TO BE DEVELOPED BY THE PROPOSED A.I.D. LOAN II

PARTICULAR	TOTAL COST OF PROJECT (\$000US)					TOTAL	LOAN CONTRIBUTION		
	1976-79	1979-80	1980-81	1981-82	1982-83		% of Total	% of Total	Loan
Operation including professional salaries	4,016	4,443	4,999	5,736	6,806	26,000	0	0	0
Training including academic and short term within country and externally	498	655	510	361	141	2,165	2,165	100	21.6
Library-books, periodicals, journals, materials, etc.	0	100	199	-	-	299	299	100	1.0
Infrastructure-buildings, housing, utilities, and land development	2,100	2,902	3,849	2,000	-	10,851	5,002	46	50.0
Equipment and machinery for laboratories and farms	0	607	1,682	-	-	2,289	2,289	100	25.0
Technical advisory services	20	20	143	42	20	245	245	100	2.4
Total including operation cost	6,634	8,727	11,382	8,139	6,967	41,849	10,000	24	100.0
Total excluding operation cost	2,618	4,284	6,383	2,403	161	15,849	10,000	63	

NOTE: U.S. Fiscal Year is October 1 to September 30 of the following year.

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library purposes will cover the foreign exchange cost of books, journals, equipment and materials for the scientific literature service, as well as for basic references for each center. The Scientific Literature Service, in addition to books based largely in the libraries of UPLB, SEARCA and IRRI, is designed to provide personnel away from the Los Banos Complex with a means of keeping abreast with important work being published and to provide direct access to publication of special relevance to their research.

The loan funds will cover all costs for foreign training (\$0.969 million) and \$1.196 million will support graduate level training in local institutions, for an estimated 237 M.S. and 92 Ph.D. degrees or about 750 man-years which is 100 percent of the projected degree training to be financed by the loan. The external training will support seven Ph.D.'s in selected disciplines, as well as short term training for refresher and upgrading purposes, and attendance in international scientific conferences and short observation tours. The present PCARR Scholarship Program covering a total of 263 (37 Ph.D. and 226 M.S.) is the largest if not one of the largest in the Philippines. In addition, it support 34 scholarship for B.S. in fisheries. Large as it is however, it is not sufficient to generate enough graduates to man the research station network at the desired rate. Technical advisory services for the project to be provided by the loan will cost approximately \$0.120 million for 15 man-months of international service covering research management, evaluation and specialists in a number of disciplines and 156 man-months of in-country consultants from institutions other than PCARR.

In summary, the \$10 million loan will be divided into \$3.67 million in foreign exchange cost and \$6.323 million in reimbursable local currency cost. (Please refer to Tables 11 and 12.)

The total estimated funding requirement of the project for the first two years (1979-80 and 1980-81) is \$15.4 million of which \$5.9 million will be used for development of the centers, exclusive of salaries and operational costs. Since the loan is to be obligated in two tranches of \$5.0 million in FY-79 and \$5.0 million in FY-81, the GRP has the responsibility of providing adequate "seed money" to ensure timely completion of the structures. It is estimated that minimum funding levels of \$2.1 million the first year and \$2.9 million the second year will be needed, exclusive of those structures to be totally funded by the GRP, if reimbursement is to be achieved on schedule.

TABLE 11-SUMMARY OF COST ESTIMATE AND FINANCIAL PLAN
OF PROSED LOAN II PROJECT
(\$ 000 US)

	AID		GOP		TOTAL
	FX	LC	FX	LC	
Infrastructure	-	5,002	-	5,849	10,851
Equipment	2,588	-	-	-	2,588
Training	969	1,196	-	-	2,165
Consultants	120	125	-	-	245
Total (fixed development costs)	3,677	6,323	-	5,849	15,849
Research support/including Maintenance/operation				26,000	26,000
TOTAL	3,677	6,323		31,849	41,849
Escalation (15% fixed development)		750		877	1,627
Contingency (10%)				2,600	2,600
GRAND TOTAL					46,076

FX- Foreign Exchange Cost

LC- Local Currency Cost

Amount to be financed by AID - \$10,000

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TABLE 12 - SUMMARY OF U.S. CONTRIBUTION TO PROPOSED AGRICULTURAL
RESEARCH LOAN II PROJECT (\$000 US)
(\$000)

Particular	1978-79	1979-80	1980-81	1981-82	1982-83	Total	Local Currency Cost	Foreign Exchange Cost
<u>I. Technical Advisor</u>								
<u>Short Term</u>	20	20	143	42	20	245	125	120
<u>II. Training and Manpower Development</u>								
<u>International</u>								
Academic for Ph.D. <u>1/</u>	66	108	115	35	-	324		
Upgrading, Refresher <u>2/</u>	264	211				475		
Scientific Conferences and short term Obser- vation <u>3/</u>	34	52	55	29		170		
	<u>364</u>	<u>371</u>	<u>170</u>	<u>64</u>		<u>969</u>		969
<u>In-Country</u>								
Academic For Ph.D. <u>4/</u>	91	185	193	193	94	756		
Academic for M.S. <u>5/</u>	43	99	147	104	47	440		
	<u>134</u>	<u>284</u>	<u>340</u>	<u>297</u>	<u>141</u>	<u>1,196</u>	1,196	
Sub-Total	498	655	510	361	141	2,165		
<u>III. Library-Books, Journal Film, Materials, etc.</u>	-	100	199	-	-	299		299
<u>IV. Infrastructure-Buildings Utilities and Land Dev.</u>	100	2,000	2,902			5,002	5,002	
<u>V. Equipment-Research, Farm Machinery and Vehicles</u>	-	107	1,682	-	-	2,289		2,289
GRAND TOTAL	<u>618</u>	<u>3,582</u>	<u>5,438</u>	<u>403</u>	<u>161</u>	<u>10,000</u>	<u>6,323</u>	<u>3,677</u>

1/Total of 7 staff for 252 man-months

2/24 Participants for 6-12 months in U.S. or Third Country

3/71 participants for 3-6 weeks in U.S. or Third Country

4/Total of 92 staff in local institutions

5/Total of 237 staff in local institutions

NOTE: U.S. Fiscal year is October 1 to Sept. 30 of the following year.

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TABLE 13 - QUARTERLY FUNDING REQUIREMENT OF THE PROPOSED
A.I.D. LOAN II FOR 1979 TO 1981
 (000000)

PARTICULAR	1979-80					1979-80					1980-81				
	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	Total
<u>I Operation & Personnel</u>															
GDP	-	1,608	1,218	1,201	4,027	1,777	1,333	1,333	-	4,443	1,599	1,500	1,500	-	4,999
<u>II Training & Manpower Dev.</u>															
<u>A. International</u>															
<u>a. Loan</u>	-	-	187	177	364	105	133	40	93	371	22	74	9	55	170
<u>B. In-Country</u>															
GDP	-	67	67	-	134	142	-	142	-	284	170	-	170	-	340
Loan	-	-	67	67	134	-	142	-	142	284	-	170	-	170	340
<u>III Equipment (including Licenses)</u>															
Loan	-	-	-	-	-	-	-	400	307	707	940	600	341	-	1,881
<u>IV Infrastructure</u>															
GDP	-	500	700	900	2,100	1,000	1,200	700	-	2,900	1,200	1,400	1,249	-	3,849
Loan	-	-	-	100	100	400	600	600	400	2,000	1,500	900	500	-	3,900
<u>V Technical Advice</u>															
GDP	-	-	20	-	20	10	10	-	-	20	27	27	-	-	54
Loan	-	-	-	20	20	-	10	10	-	20	45	71	27	-	143
TOTAL: GDP	-	2,173	1,997	2,103	6,270	2,929	2,943	2,177	-	7,649	3,356	2,927	2,919	-	9,242
 Loan	-	-	254	364	618	505	685	1,050	942	3,312	2,507	1,615	875	235	5,436

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TABLE 14

FINANCIAL OBLIGATION OF PHILIPPINE GOVERNMENT TO PROPOSED
AGRICULTURAL RESEARCH LOAN II PROJECT 1/

PARTICULAR	1979	1980	1981	1982	1983	CONTRIBUTION		TOTAL
						LOAN	GOP	
<u>I. Technical Advisory</u>								
In-Country	20	20	54	31	-	125	-	125
<u>II. Training and Manpower Development</u>								
<u>In-Country</u>								
Academic for Ph.D. 2/	91	185	193	193	94	756	-	756
Academic for M.S. 3/	43	99	147	104	47	440	-	440
Sub-Total	134	284	340	297	141	1,196		1,196
<u>III. Infrastructure</u>								
-Building Utilities and Land Development	2,100	2,902	3,849	2,000	-	5,002	5,849	10,851
<u>VI. Operation including professional salaries</u>								
TOTAL	4,016 6,270	4,443 7,649	4,999 9,242	5,736 8,064	6,806 6,947	- 6,323	26,000 31,849	26,000 38,172

1/ Includes GOP Seed funds

2/ Total of 92, staff in local institution

3/ Total of 237 staff in local institution

NOTE: Philippine Fiscal year same as calendar year (Jan.-Dec.)

FBT/gdt

11/6/78

C. Social Analysis

There appears to be no complicating social issues that will interfere with the successful development of the research complexes and the proposed integrated research operations to be conducted therein. The immediate target of this loan is to improve the capability to generate, verify and disseminate an increased quantity and quality of relevant research in the strategic region to be served by the centers. The actual beneficiaries will initially be the small farmers who dominate the agricultural sector and ultimately both small producers and consumers.

A review of farm size and farm population clearly illustrates that agriculture in the Philippines is overwhelmingly a small farmer operation. Approximately 85 percent of the nation's 2.4 million farmers operate less than 5 hectares and 61 percent less than 2 hectares. Indeed, the average land holdings of all farmers in the Philippines is 3.6 hectares (Table 16). Obviously, any agricultural research program involving the majority of crops and livestock produced in the Philippines impacts primarily upon the highly visible small farmers since such a great majority of Filipino farmers are small operators.

This situation is recognized by the Government of the Philippines and their concern has been well demonstrated by channeling increased funding into programs supporting activities of small farmers. These include a non-collateral credit program for small rice farmers under which 3 billion pesos have been extended since inception of the program. A similar supervised credit program for corn and sorghum producers and to which soybeans will likely be added is underway. Fertilizer prices to producers of food crops has been subsidized for several years and the National Food and Agriculture Council (NFAC) has employed 5,000 NFAC agents to work with over 700,000 participating farmers in key food production programs. Credit support for these programs is strengthened by the Central Bank requirement that 25% of the loanable funds from banks be set aside for agricultural lending.

The evidence available indicates that the small Filipino farmer does respond to improved technological packages as demonstrated in the rice production program. Rice production has increased from 3.8 million tons to 4.7 million tons over the last three years, making the Philippines self-sufficient in rice at this time. This is the result of improved technology packages that are acceptable to the small producer, supported by credit and extension assistance. Hopefully, the same approach with corn, sorghum and soybeans will result in similar improvements in production levels.

TABLE 15 Number and Area of Farms, by Type of Farm, Philippines, 1971

Type of Farm	Area		Farms		Ave. Size of Farm (Has.)
	Has. (000)	%	No. (000)	%	
All Farms	8,494	100.0	2,354	100.0	3.6
Palay	2,661	31.3	982	41.7	2.7
Corn	1,494	17.6	514	21.8	2.9
Coconut	2,153	25.3	432	18.4	5.0
Tobacco	7	0.1	4	0.2	1.9
Sugarcane	368	4.3	27	1.2	13.6
Citrus	6	0.1	1	0.04	6.6
Vegetable	16	0.2	8	0.3	1.9
Tuber, root & bulb crops	68	0.8	33	1.4	2.1
Coffee	48	0.6	14	0.6	3.4
Abaca	64	0.8	12	0.5	5.2
Banana	58	0.7	14	0.6	4.3
Pineapple	13	0.2	1	0.04	30.4
Other Fruits	22	0.2	6	0.3	3.8
Chicken	4	0.1	3	0.1	1.3
Hog	24	0.2	12	0.5	2.1
Cattle	387	4.6	24	1.0	16.4
Others	1,094	12.9	266	11.3	4.1

Source: 1971 Census of Agriculture

However, it must be remembered that there remain many farmers who have not participated in programs involving new technological packages. This may be due to location or other physical factors but a part of it is inherent in the rate of adoption of new technology by individuals within any society. Experience in many countries, including the U.S., has shown that there is a substantial lag time in acceptance of new technology ranging from the early innovators to the late adopters. It took 14 years for acceptance of hybrid corn and 20 years for acceptance of wide scale soil testing within the U.S. Experience also teaches that agriculture research is an investment and that its effect on productivity cannot be realized immediately but rather is distributed as a stream of benefits over the sequence of years required to disseminate the new findings and have them adopted. Most agricultural research is not short-term in its pay out in that large gains occur over a long period of time. Hence, research will not normally result in quick, dramatic solutions to the need for increased food and feed production. Nevertheless, it is equally important to recognize that new technology, the basic input for increased productivity, will not be generated in the absence of an effective research system.

As the data presented in Table 16 shows, with rare exceptions all commonly produced crops and livestock in the Philippines are primarily the products of small Filipino farmers, including non-food crops such as coconuts, tobacco and coffee. PCARR and the Regional Offices of NEDA recognized this situation in setting research priorities for the various regions during the Second Tri-Annual National Research Congress held in October, 1976.

Aware that research only takes on meaning when applied to the solution of problems, PCARR has developed a program whereby every research center will conduct field trials in farmers fields as one method of ensuring that new technology packages are relevant and made known to small producers. This will assure that a dialogue is established between producers and researchers. Additionally, the establishment of the village (Barangay) research units (Annex G) and establishment of the rural training centers for extension agents, financed by IBRD, at research centers will strengthen the program of spreading research results to the initial beneficiaries, the small farmers.

Recognizing the need for a better understanding of rural forces and the non-biological dimensions of rural development, studies to be conducted by behavioral scientists are scheduled at an increased level. In addition, the commodity research teams include sociologists and economists to ensure that these aspects are addressed in designing the research and field testing activities. Strengthening these efforts will contribute to minimizing problems in income disparity and will help temper the social impact of introducing new technologies.

The secondary beneficiaries of agricultural research are consumers. The typical pattern of benefits from agricultural research has been first the producers, then as expanded output lowers prices, producer benefits decline rapidly while consumers gains continue upward. Consumer gains persist long after producer benefits have ebbed. Sometimes agricultural research that was started to help producers does so, but also gives an unforeseen bonus with results that benefit a much wider group. As examples, discoveries of this type from state agricultural experiment stations in the U.S. include Vitamin B-12, Vitamin A, streptomycin, aureomycin and dicumarol. There is every reason to believe that as the Philippine research capabilities improve over time, similar results should occur within the Philippines.

As to the effect of agricultural research on income distribution, the primary research effects on income inequality occur as a consequence of the gains in agricultural productivity that are transferred to consumers. As pointed out by Schultz, historically the effects reducing the real costs of producing farm products has benefited the consumers. The real income of low-income families is increased thereby, and relatively more than the real income of high-income groups. There is much evidence which shows that the primary accumulative effect of agricultural modernization, including agricultural research, has not been unjust to poor people; on the contrary, it improves their lot more than it does the rich, reducing inequality in income.

Closely related, Schultz, also points out that the share of income of landlords declines as agricultural modernization proceeds. Some of the credit for the fading away of this landlord class belongs to agricultural scientists because they have come up with substitutes that decrease the proportion of production creditable to land.

D. Economic Analysis

When trying to estimate the economic contribution of agricultural research, the most convenient yardstick is the history of similar experience in other nations. Projects such as the proposed institutional building activity cannot be characterized as direct revenue producing nor are they easily quantified, hence bringing into question the appropriateness of cost-benefit or cost-effectiveness analysis. The lack of consensus among theoretical economists as to the validity of the concept of surplus, the framework for estimating the returns to research, has also been raised by some critics. Therefore, attempts to quantify economic and social ex ante benefits from agricultural research can only be highly speculative in view of the uncertainty inevitable in research. However, some

measures of the economic contribution of research can be obtained from ex-post facto analysis and it appears that the considerable number of studies reported by reputable economists represents an appropriate measure of this economic contribution. This position is strengthened by observing that societies benefiting from a well developed agricultural sector have and continue to actively support an expanded agricultural research program, indicative of the social and economic values received.

Relative to the historical studies on the economic contribution of agricultural research, two approaches have been followed: studies of direct Cost-Benefits of specific commodity programs and selected sources of growth type studies.

Summaries as presented by Arndt, and Ruttan^{1/} are as follows: (See Table 17a-b).

The most salient feature of these studies is the extraordinary high pay-off to research investment. At least twice, perhaps 3 times as much growth is purchased with the research dollar than with other program dollars.

It is not enough however to show that research programs usually yield a high economic pay-off. Developing countries normally operate with very limited resources and it might be argued that new technology could be obtained in a cheaper manner by a simple transfer of research results from other countries. Unfortunately, the history of agricultural development demonstrates that technology transfer has been minimal and only as a result of more recent studies by Evenson, Evenson and Kislev, Perrin and Winkelman, and others were more definitive explanations offered. These studies provide evidence that the extent to which a country benefits from the research findings of other countries depends on its own research capability. Countries without the capacity to produce internationally significant research publications also lack the capacity to borrow technology from other countries. Extension and other related programs on their own did not facilitate transfer. Furthermore, countries with indigenous research capability were able to benefit from research done in other similar climatic regions, but not from research conducted outside similar regions. This may explain why research findings from temperate zones have so frequently failed to be successfully adopted in tropical areas.

The studies also suggest that approximately 40 percent of the productivity growth in agriculture is the result of indigenous research whereas technology transfer from other national systems in similar regions provided 35 percent and findings from international

^{1/} Thomas M. Arndt and Vernon W. Ruttan, Resource Allocation and Productivity in National and International Research, University of Minnesota Press, 1977.

Table 17 - Summary of Direct Cost-Benefit Type Studies of Agricultural Research Productivity

Study	Country	Commodity	Time Period	Annual Internal Rate of Return (%)
Griliches (1958)	U.S.A.	Hybrid corn	1940-55	35-40
Griliches (1958)	U.S.A.	Hybrid sorghum	1940-57	20
Peterson (1966)	U.S.A.	Poultry	1915-60	21-25
Evenson (1969)	S. Africa	Sugarcane	1945-62	40
Ardito Barletta (1970)	Mexico	Wheat	1943-63	90
Ardito Barletta (1970)	Mexico	Maize	1943-63	35
Ayer (1970)	Brazil	Cotton	1924-67	77+
Schmitz & Seckler (1970)	U.S.A.	Tomato harvester With no compensation to displaced workers	1958-69	37-46
		Assuming compensation of displaced workers for 50% of earnings loss		16-28
Hines (1972)	Peru	Maize	1954-67	35-40 ^a 50-55 ^b
Hayami & Akino (1975) ^c	Japan	Rice	1915-50	25-27
Hayami & Akino (1975) ^c	Japan	Rice	1930-61	73-75
Hertford, Ardila, Rocha, & Trujillo (1975) ^c	Colombia	Rice	1957-72	60-82
	Colombia	Soybeans	1960-71	79-96
	Colombia	Wheat	1953-73	11-12
	Colombia	Cotton	1953-72	None
Peterson & Fitzharris (1975) ^c	U.S.A.	Aggregate	1937-42 1947-52 1957-62 1967-72	50 51 49 34

^aReturns to maize research only.

^bReturns to maize research plus cultivation "package."

^cFrom papers presented at Conference on Resource Allocation and Productivity in National and International Agricultural Research, Agricultural Development Council, Research and Training Network Program, Airlie House, Virginia, January 26-29, 1975.

**SUMMARY OF SELECTED SOURCES-OF-GROWTH TYPE STUDIES OF
AGRICULTURAL RESEARCH PRODUCTIVITY**

Study	Country	Commodity	Time Period	Annual Internal Rate of Return (%)
Tang (1963)	Japan	Aggregate	1880-1938	35
Griliches (1964)	U.S.A.	Aggregate	1949-59	35-40
Latimer (1964)	U.S.A.	Aggregate	1949-59	Not significant
Peterson (1966)	U.S.A.	Poultry	1915-60	21
Evenson (1968)	U.S.A.	Aggregate	1949-59	47
Evenson (1969)	S. Africa	Sugarcane	1945-58	40
Evenson (1969)	Australia	Sugarcane	1945-58	50
Evenson (1969)	India	Sugarcane	1945-58	60
Ardito Barlotta (1970)	Mexico	Crops	1943-63	45-93
Evenson & Jha (1973)	India	Aggregate	1953-71	40
Kishor, Saxena, Bai, & Jha (1975) ^a	India	Aggregate	1960/61-1972/73	63

^aFrom paper presented at Conference on Resource Allocation and Productivity in National and International Agricultural Research, Agricultural Development Council, Research and Training Network Program, Airlie House, Virginia, January 26-29, 1975.

institutions accounted for 25 percent. It is also interesting to note that the studies indicated that investments in the more science based research or more basic as frequently termed had the highest marginal pay-off.

The studies by Ferrin and Winkelman were concerned with ascertaining the impediments to adoption of new technology and revealed that advances in adoption will not occur unless the technology is developed within the agro-climatic environment of farmers which are to be encouraged to use it. Their findings indicate that contrary to popular opinion, availability of inputs, information, markets, farm size and risk aversion or risk perception by farmers were only of limited influence in explaining the adoption or failure to adopt new technology. The most pervasive explanation was the expected increase in yield due to differences (sometime subtle) in soils, climate, water and other biological factors. Their findings support the position that development of appropriate agricultural technology is more site specific than previously thought, reinforcing the concept that genotype-environment interaction still dictate that efficient technology development requires research tailored to specific "target" environments. Government policies can be expected to influence the rate of adoption where yields are now marginal but farmers will not adopt new technology unless they believe it is highly relevant to their local area. A small number of highly sophisticated international centers, however well operated may contribute little unless their findings are adapted and demonstrated within the multitude of environments occupied by the majority of small farmers. This cannot be realized until indigenous research capabilities are adequately developed to service the widely dispersed agro-climatic zones present within the country. This was well expressed by Dr. J. W. Mellor (1975) in his statement-- "The variability in agricultural conditions requires a widely dispersed system of research, a complex institution building problem".

In the case of this project, the potential impact for improved technology to raise productivity is very large because of the very low average yields currently attained in comparison with those of other countries (Table 18). Even though such a comparison with different ecological zones must be handled carefully, it points to the potential for improvement. Since a large number of the research centers include colleges or universities within their organizational scheme (Table 8), the long term benefits from upgrading staff and facilities are significant. Development of indigenous capability to train additional research and extension workers in sufficient numbers and quality to support expanded and improved development is essential if development is to be self-sustaining. With the upgrading of staff as a result of the sizeable training component, it will be possible for additional institutions to offer quality graduate and research studies as well as enriching the undergraduate program. Such an expansion is vitally needed to

TABLE 18 - Yields of Selected Philippine Crops Compared to Other Countries
(tons/hectare)

Crop	Philippines	USA	China	Japan	Thailand	Indonesia
Wheat - total	1.80	5.27	3.27	5.84	2.00	2.41
Corn	0.86	5.41	2.86	2.60	2.54	0.89
Sorghum	-	3.28	2.33	1.10	1.95	-
Soybeans	0.77	1.52	0.83	1.53	-	-
Peanuts	0.37	2.79	1.24	2.20	-	-
Sweet Potatoes	4.40	12.58	9.54	-	9.17	6.23
Cassava	5.39	-	15.77	-	11.8	6.96

Source: Joint ESCAP/FAO Agriculture Division, 1975.

service the total manpower needs of agricultural research. No country can hope to reach a self-sustaining basis as long as it must rely on training its manpower abroad.

Accurately measuring the economic impact from improved educational opportunities is difficult but a review of the core staff currently serving to guide PCARR in the decision-making of research priorities, research planning and evaluation, as well as the graduate staff occupying key positions in training institutions, such as the University of the Philippines at Los Banos, amply demonstrates the long-range benefits of investing in human resource development. The current value of the development program of those previously trained is many times the original investment in their graduate training.

E. Administrative Capabilities

The National Economic and Development Authority (NEDA) will represent the GRP as the recipient of the loan and as with other loans, monitor the administrative application of the loan funds.

The Philippine Council for Agriculture and Resources Research (PCARR) will serve as the GRP agency responsible for project implementation, management and evaluation. The PCARR will provide or arrange for the necessary GRP counterpart financial and manpower requirements necessary to execute the project.

The PCARR was created by the GRP and given the responsibility for developing an effective, efficient research system. They have the authority and responsibility for coordinating and managing manpower, facilities, funds and program resources for research involving agriculture, forestry, fisheries and natural resources other than oil. They have the authority to solicit assistance from any department, bureau, agency, public college or university, commodity institute or other instrumentality of the GRP, including personnel, facilities and resources. For a detailed description of the PCARR organization (See Annex F).

The PCARR Secretariat is headed by a Director General, Dr. J.D. Drilon, who is a recognized international authority in the development field. He is assisted by two Deputy Director Generals, one of which is responsible for Program Development and one responsible for Station Development. These officers are assisted by seven well qualified Research Directors who head the commodity research divisions and three technical and administrative support divisions which are in turn assisted by some one hundred full-time support staff members.

PCARR draws upon the available research talent of the country by utilizing the best available scientists to participate on an on-call basis to serve as research team leaders of the 32 commodity teams and as members of the commodity research teams. This arrangement minimizes the number of full-time core staff while providing for involvement of a broad segment of the scientific community in addressing critical research problems.

The PCARR Secretariat is responsible to the Governing Council, which establishes the policies and procedural guidelines for administration of the research system.

At the field level each research center is headed by a Research Center Director, who exercises overall supervision of development of the center as well as the research studies undertaken.

Achievements by PCARR relative to developing a viable research administrative system have been remarkable in view of the young age of the organization. A network of research centers have been identified and a long term improvement plan developed. A capable core secretariat staff assembled and functioning. Close linkages established with Philippine agencies and institutions as well as the private sector, international research centers and other national centers. A detailed survey of manpower resources conducted and from that base a manpower development program planned. Research priorities established in cooperation with NEDA, other departments and bureaus, agricultural colleges and universities and the private sector, including farmers. A system for updating the priorities has been developed. Review of research proposals has been systematized and synchronized with the budgeting process of the GRP. Established an evaluation system for screening research projects as well as for assessing progress of on-going research. Developed a "scientific literature service", in cooperation with SEARCA, IRRI and UPLB so that researchers in the outlying regional centers and supporting stations have an opportunity to learn of and select copies of current research reports in their disciplines.

Although PCARR is not the GRP agency responsible for conduct of extension programs, they have consistently exhibited a keen awareness of the need to see research findings translated into farm practices and benefitting small producers. To that end, they have developed a corps of subject matter specialists to translate research findings into semi-technical bulletin for extension and other change agents; publication of a monthly bulletin which provides briefs of recently completed research; and weekly farm news reports to approximately 100 radio stations serving the rural areas.

In addition, to the above mentioned activities for bridging the gap between research and extension, PCARR is participating in direct outreach activities to reach small producers. One of the most exciting programs is an applied research and pilot extension program on cropping systems being cooperatively conducted by IRRI, PCARR and the Bureau of Agricultural Extension (BAEX). Details of this program are presented in Annex G.

To ensure and strengthen the exchange of information between researchers and farmers, researchers are now being funded to conduct their verification trials on private farms. The locations of on-farm trials approved for funding this year are listed in Annex-I, Section 2.

Although not a research or PCARR activity, the GRP has recognized the need to strengthen the extension services as a companion development effort to improving and increasing the indigenous research

capability. To help achieve the expansion and improvement in the extension services, the GRP has recently obtained a \$35 million loan from IBRD. Additionally, under another IBRD loan, training centers for rural development are being established which will be used for training extension agents and farmers. The five Regional Training Centers are all located at research centers or stations in the PCARR research network. This close relationship between researchers and extension training centers should prove mutually beneficial. For details, see Annex G, Section 3.

The greatest shortcomings of PCARR have been associated with retarded implementation of the first agricultural research loan. However, in view of a 15 month delay in release of seed money on the part of the GRP Budget Commission; the lack of an AID project counterpart officer for the first 8 months following execution of the loan agreement, and being PCARR's first exposure to the myriad rules, regulations, and detailed administrative actions intrinsic in both GRP and AID procedures, implementation has accelerated greatly and achieved an acceptable level in all components other than technical assistance and international training. All planned infrastructure is underway and approximately 80 percent completed; the final bids for commodity procurement have been opened and the major part of the manpower training has been on schedule. The GRP funded portion of the infrastructure is ahead of schedule.

PCARR has added additional staff to monitor and supervise the development undertaken at the centers and have demonstrated their capability to select, award and administer contracts for procurement and construction,

The two weaknesses in implementation of the first loan as previously mentioned involved training of a very small number of Ph.D.'s abroad and utilization of outside expertise as technical consultants. PCARR is aware of these weaknesses and have made plans to correct them. They will be given assistance in locating top level outside expertise for the limited help they need and Ph.D. candidates for the seven slots will be identified within the first year of the loan.

Recognizing the experience gained with implementation of the first loan, the Mission believes that PCARR now possesses the capability to administer all components of the proposed activity in a timely manner.

On the A.I.D. side, there is a Project Officer with over a decade of research experience who will serve as the counterpart to the PCARR Project Manager.

F. Role of Women

Although this project is not directly involved in affecting social changes to alter the roles of women and girls in the Filipino society, the distaff element will be beneficiaries of the project, both as direct participants in developing an improved and expanded research capability as well as beneficiaries of improved technology generated from research. At the present time 30 percent of the graduate level scholarships provided by PCARR are for women and 25 percent of the team leaders and/or research directors are women. Improved technology generated by research will provide a better work/benefits ratio, increased opportunities for the rural poor and an improved opportunity for a better diet, both in quality and quantity for the nations people. Although there can be no guarantee that males and females will share equally in these benefits, within the Filipino family culture the children, half of which are girls, should derive the greatest long term benefit from this project.

Part IV. Implementation

A. Implementation Plan

PCARR will be the GRP organization responsible for implementing this project within policy and procedural guidelines established by the PCARR Governing Council and within the guidelines established in the approved budget plan, the Loan Agreement, Implementation Letters and this project paper.

The Budget Commission is the GRP organization responsible for the approval and release of budgeted funds necessary to undertake the major part of this project and NEDA retains certain administrative monitoring responsibilities.

All research activities will be conducted by Philippine scientists and all operational costs (salaries, supplies and maintenance) as well as approximately 54 percent of the new infrastructure costs will be supported by the GRP budget. Operational costs represent approximately 56.5 percent of the total project costs but only about \$8.5 million or 34 percent of the total operational costs represent add on or new monies.

Responsibility for project monitoring on the AID side will be within the Office of Agricultural Development. A Direct Hire project Officer with research experience will serve as counterpart to the PCARR and receive support assistance of other relevant USAID offices, including but not necessarily limited to the Office of Capital Development, Program Office, Office of the Controller and Office of Agriculture Development. The Project officer also serves as liaison with other agricultural research activities supported in part by AID.

Technical Assistance

Technical assistance in the form of short-term consultants from both off-shore and in-country sources will be provided on an intermittent basis during the project life span. This services will be obtained under cooperating country contracts. USAID retains approval rights on all contracts for consultancies and to ensure that the contracting procedure is understood, acceptable contract formats are called for as a Condition Precedent to Disbursement of Loan funds. Contracts will include specific job description and report requirements. For in-country consultants, PCARR will pay in Pesos and AID will reimburse upon submission and approval of vouchers and final report.

Manpower Development

Training involves both in-country and international. The in-country training will operate under a FARA as used and found satisfactory in the first loan. Reimbursement is made upon satisfactory completion of each term of study. PCARR provides detailed lists of participants, their fields of study, research center where employed and grade levels achieved. Participants are selected under established guidelines which have proven successful.

Academic training in foreign institutions is limited to fields of critical shortage for which local facilities are limited. To ensure the limited slots are filled, all candidates will enter training within 12 months of execution of the loan agreement under the first tranche of funds obligated.

Medium term training abroad will be non-degree and will permit refresher type training and post graduate training for scholars that have not had an opportunity to be exposed to external research institutions. It is envisioned that this training will take place at U.S. universities, U.S.D.A. or other such specialized organizations and/or international centers such as CIAT. For this kind of training research and teaching staff engaged in training other research personnel will be given full consideration.

Standard PIO/P documentation and procedures will be used as is possible for the above mentioned types of international training.

Short term observational training and participation in international short courses, workshops and conferences will also be processed using PIO/P procedures. However, it is envisioned that if possible a revolving dollar account will be established which would be reimbursed upon completion of the training and submission of travel vouchers and trip report. This procedure would place a greater workload upon PCARR, especially the training division.

Commodity Procurement

Procurement of loan funded commodities will be accomplished in accordance with A.I.D. Handbook No. 11. Following the experience gained in the first loan it is believed that PCARR now has the experience to prepare the Invitations for Bids and other pertinent documents. They also have the services of a management specialist from the Educational Development Projects Implementing Task Force (EDPITAF) which the Mission considers capable in the procurement area.

Loan funded commodity procurement will be limited to the U.S. and eligible AID Code 941 countries with the exception of a few items for which a waiver will be requested. All off-shore procurement will be paid for in dollars using standard AID Letter of Commitment and Letters of Credit financing procedures.

Annex-C presents the types and quantities of commodities which will be procured but this list is subject to refinement.

In case of references and journals, these will be procured through canvassing reputable book jobbers principally in the U.S. However, it is recognized that some excellent and relevant publications may be available only from Code 935 sources and a waiver will be requested to permit procurement of specialized publications from such sources.

Since the loan is being financed in two tranches, it is anticipated that the bulk of the commodities will be ordered under the initial tranche.

Infrastructure Development

Infrastructure will be financed on a fixed cost reimbursable basis by means of FARA's. Reimbursements of a fixed percentage of the agreed upon costs will be made for completed, operational structures meeting the design and specifications agreed to. In no case shall AID reimbursement exceed 75 percent of the previously agreed upon costs for structures, including utilities (water, power, sewage) and in some cases, basic furnishings necessary to make the structures operational.

FARA's involving infrastructure development will be executed prior to or at the same time as USAID final approval is given of plans and specifications.

Since FARA arrangements will be followed, which require the GRP to meet the costs of completing structures before reimbursement can be requested, it is anticipated that the initial structures undertaken during the first two years will be predominately those eligible for reimbursement. It is planned that the major portion of the reimbursable structures will be complete or nearing completion by the beginning of FY-81 at which time the second tranche of funding will be available. This schedule will permit final reimbursement for the infrastructure component soon after the funds are available. This schedule should encourage prompt release of the additional funds needed for the additional structures to be totally funded from GRP funds.

The implementation of design and construction of the infrastructure is shown on the accompanying preliminary PPT network, Annex K. As can be seen, all loan funded infrastructure components of this project are scheduled for completion within three years. The infrastructure work may be divided into three components and will be implemented as follows:

- a) Design of buildings and structures is expected to be carried out with private sector A/E firms or other qualified organizations approved by AID. Design and specifications will be approved by AID and PCARR will utilize to the maximum possible design developed under the first loan.
- b) In most cases, construction will be undertaken by competitive bid contracts. However, if PCARR can demonstrate that force account construction is more advantageous for certain elements of work, force account construction will be permitted. Should

this procedure be utilized, a more stringent set of monitoring controls will be enforced.

- c) Designs for farm development will be accomplished by PCARR with assistance from other GRP agencies and/or private qualified consulting firms. Construction will be by force account and/or competitive contracts. Monitoring will be carried out as described previously.

PCARR will provide independent monitoring of the engineering design, specifications and construction satisfactory to AID, and if necessary, using a private sector firm or organization acceptable to AID. This arrangement will provide necessary management, fiscal, and technical controls for administering the fixed amount reimbursement (FAR) procedure. The monitoring costs by a private sector A/E firm would be eligible for reimbursement.

Construction will also be monitored by the engineering section of the USAID office of Capital Development. Final approval for reimbursement will also be provided by the same office.

Contract and Contractor Approval

All professional and construction service contracts and contractors will be approved by USAID pursuant to AID requirements.

Other Donor Coordination

Although other donors are providing and plan to provide assistance for agricultural development in the Philippines, only limited resources are planned for supporting the research areas and thrust with which this project is concerned.

Several agricultural colleges included in the overall research network received limited educational materials and equipment from a UNESCO project. Similarly, some agricultural schools are receiving support from an INRD loan which will contribute to enhancing research but principally to approved training at the lower levels.

PCARR received a "start up" grant from the Ford Foundation and Canada is providing assistance through SEARCA for organizing the Scientific Literature Service. A recently completed agreement with the International Development Research Center (Canada) is also providing assistance toward the operation of the Root Crops Research Center of the PCARR network. The principal external assistance has been the AID Research Loan which made it possible to initiate development at the four previously selected centers and which is the fore-runner of this loan.

Other activities which have a relationship to the loan include:

- a) **A UNDP/FAO Soil Classification Project.**
- b) **AID, FAO and Japanese assistance in fisheries.**
- c) **AID assistance to the National Crop Protection Center.**
- d) **A UNDP/FAO Project on grain handling, storage and processing.**
- e) **The network of International and National Research Centers. PCARR has negotiated agreements for technical cooperation with the following organizations: International Rice Research Institute (IRRI), Centro Internacional por Mejoramiento de Maizc Y Trigo (CIMMYT), International Crops Research Institute for Semi-Arid Tropics (ICRISAT), Centro Internacional de Agricultura Tropical (CIAT), International Institute of Tropical Agriculture (IITA), the Rubber Institute of Malaysia (PRIM), the Asian Vegetable Research and Development Center (AVRDC), the Southeast Asian Fisheries Development Center (SEAFDEC) and the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), the University of Illinois INTSOY Program, and the University of Hawaii soils research program. PCARR also is linked up with the national research systems of India and Bangladesh and has maintained close liaison with the research systems of Malaysia, Indonesia and Thailand.**

Linkage with the international and national institutions for exchange of research findings, germplasm materials and expertise will contribute to acceleration of the research efforts.

- f) **A number of AID centrally funded research activities with U.S. universities are engaged with or desire to be engaged with Philippine entities which are affiliated with the PCARR organization and network.**
- g) **A recently executed IBRD loan will help the GRP strengthen the extension service which will contribute to moving research results to farmers.**

The proposed AID loan does not duplicate any of these activities. On the other hand, the activities to be assisted by the AID loan will complement both AID and other donor activities.

B. Evaluation Arrangement for the Project

The project will be evaluated with respect to:

a) Implementation of Inputs

1. Training of manpower
2. Procurement of commodities/materials
3. Development of facilities
4. Use of consultants
5. PCARR research support
6. Operation and maintenance

b) Achievement of Outputs

1. PCARR fully staffed and operating efficiently.
2. Research centers and cooperating stations staffed and producing relevant research results.
3. An information system to support research functioning.
4. Qualified research personnel performing on the job.

Relative to evaluating the development of research facilities and procurement of equipment and materials, the records of procurement, delivery and construction will provide a basis for evaluation of performance against a predetermined schedule. Since construction will be partially financed through reimbursement upon completion of agreed upon units, evaluation is minimal since there will be systematic monitoring.

With respect to training, the records of performance of students from the university and subsequent assignment will provide a basis for evaluation. Relative to the GRP inputs, staffing patterns, budgets, expenditures and project records will provide a basis for evaluating their best performance.

As to the evaluation of research projects which are the heart of this project, PCARR has developed and built into the system the formats and procedures for monitoring and evaluating research projects on an annual schedule. Research projects are evaluated by a team consisting of the Research Director of the commodity/discipline concerned or the commodity team leader, program specialist and one or more representatives of the implementing and/or funding agency. Evaluation is made at the research location with participation of appropriate research station personnel. Research projects are evaluated as to:

- a) technical performance and contribution to project purposes,
- b) financial and administrative aspects, and
- c) relevance to priorities and research goals.

The review team may make recommendations for changes in approach, termination, expansion or reduction in scope.

The system of evaluating research projects is believed to be adequate for AID purposes and USAID, through the project manager, will verify the system from time to time. Also, PCARR has established Research Center Coordinating Committees which meet periodically with the Field Research Director at each center and his appropriate staff. The USAID project manager frequently participates in these reviews, at the request of PCARR, which provides a continuing means of measuring progress.

As to evaluating the technology transfer to farmers, no system has been established to date. PCARR is very much aware of the need and has established training positions to increase its capability to conduct sociological studies but the desired level of manpower will not be realized for several years. As an alternative solution, the use of in-country expertise available from other institutions may be contracted to outline a baseline study which could be conducted by supervised graduate students. The study would establish criteria for determining what motivates farmers to accept new technology and how acceptance is measured. The same study or parts of it could be repeated at three to five year intervals to measure acceptance. However, it must be recognized that there normally exists a time lag of at least six to ten years between development and acceptance of new technology.

The PCARR-sponsored Second National Agricultural Research System Congress (Nov. 1976) which updated the national research program first formulated in 1973 came up with quantified yields at 3 levels, namely: (1) at experiment stations, (2) at farmers' fields under controlled experiments, and (3) under actual field conditions (Table 19). These figures clearly indicate the necessity of developing technology and action programs that are attuned and relevant to the needs of the farmers and which reduces the discrepancy existing in the system of disseminating relevant technology. The gaps indicated clearly deserves immediate attention.

The gap between level (1) and level (2) is useful primarily to scientists and research administrators in determining research strategies. The gap between level (2) and level (3) is more important to be quantified and explored for its immediate usefulness for the benefit of farmers, as well as for national planning for increasing commodity productivity.

Under consideration by PCARR is a proposed nationwide encompassing research projected titled "Project Link", which is envisioned to produce the following outputs; (a) Inventory of current knowledge dissemination and utilization efforts in the Philippines. This will be very useful in determining the present capabilities and needs of existing networks and in developing model scientific

knowledge dissemination and utilization centers which will be tested before these may be institutionalized; (b) development of linkage systems among existing knowledge dissemination and utilization networks at the national/regional levels and the establishment of new linkages at the provincial/municipal levels; (c) development of model knowledge dissemination and utilization networks for the national level to the barrio level; (d) trained manpower which will support the dissemination and utilization of scientific knowledge of research agencies/institutions; and (e) monitoring and evaluation tools; and schemes for knowledge dissemination and utilization.

Once established, this linkage or network can be utilized by existing agencies such as PCARR, NSDB, NEDA, DA, DNR, etc. to hasten the pace of socio-economic development.

Table 19. Productivity per Hectare and Yield Gaps for Selected Commodities, 1976.

Commodity	Yield per Hectare			Gap I ^{a/}	Gap II ^{b/}
	Experi- ment Station	Scien- tific Farms	Farmers' Fields		
		Metric tons		percent	
Rice	5.0	3.5	1.72	30	51
Corn	5.0	2.64	0.87	47	67
Tobacco					
Cigar Filler	1.2	1.0	0.8	17	20
Cigar Wrapper	1.0	0.3	0.5	20	38
Virginia	1.5	1.2	0.9	20	25
Burley	1.0	0.8	0.7	20	13
Turkish	0.6	0.5	0.3	17	40
Coconut (tpn/ha)	5.43	4.35	1.36	20	69
Mango	25.0	10.0	5.1	60	49
Banana	20.0	10.0	7.2	50	28
Abaca	1.65	1.37	0.78	17	43
Cotton	1.8	1.0	0.8	44	20
Soybean	2.0	1.0	0.8	50	20
Mungo	1.5	1.0	0.54	33	46
Peanut	2.0	1.0	0.64	50	36
Poultry (egg prod'n)	235	230	210	2	9
Pork (Litter size at birth)	11	10	8	9	20

a/ Gap I refers to the gap between yields in experiment stations and scientific farms.

b/ Gap II refers to the gap between yields in scientific farms and farmers' fields.

Toward increasing operational efficiency in planning and evaluating research, a PCARR study is underway to design a project planning, budgeting and control system for the national research system for agriculture and natural resources. The objectives are to: (a) provide PCARR management and concerned research organizations with the necessary guidelines for the development of an integrated approach to planning, budgeting, monitoring and control of research projects; (b) provide a system for programming and translating into quantifiable terms the research projects as regards its objectives, activities, timetable, resource requirements and cost; (c) provide a system of monitoring the performance status of the projects which will serve as the basis for determining appropriate corrective measures; and (d) provide a convenient reference source for questions on planning, budgeting and control procedures and responsibilities.

Obviously PCARR has and continues to emphasize evaluation but in addition to the continuous program outlined, it is useful for external evaluations to be carried out to provide another independent check of the system. The evaluation should take place after 3 to 4 years and its cost will be chargeable to the loan.

Annex L presents an evaluation Plan for the Agricultural Research Loan II Project.

Conditions, Covenants and Negotiating Status:

1. Conditions Precedent:

It is the loan committee's opinion that the GRP shall submit or cause to be submitted (in addition to the normal AID legal requirements such as legal opinion as to effectivity of the loan agreement, designation and signature of Borrower's representatives, etc.) the following in form and substance satisfactory to AID prior to the initial disbursement of loan funds.

- a. Contract format(s) for procurement of technical services, for both in-country and out of country consultants.
- b. A basic minimal list of laboratory and field research equipment and library references deemed essential for the conduct of research at each regional center. The list will be compared to existing inventories at each center and deficits included in the commodity procurement component.
- c. Detailed schedule for construction of the loan assisted infrastructure at each site in consonance with the goal of completing it within three years.

- c. A procedural plan for utilization of loan funds approved for international training which details an expeditious procedure for nomination and approval of candidates. The plan should address updated per diem levels and service obligation for the three types of training offered.
- d. Such other conditions as AID may deem advisable.

2. Covenants:

- a. To the maximum extent possible, based upon utility rather than esthetic criteria, the design and specification for infrastructure developed under Loan I will be utilized in order to achieve cost reductions and accelerate implementation.
- b. Baseline data for each research center and for the surrounding service area, as proposed in the Evaluation Plan, Annex L, will be completed within twelve months following execution of the Loan Agreement.
- c. The approved operational budgets for research in agriculture, forestry and fisheries will be provided USAID annually, showing the breakdown on personnel and operational costs.
- d. That the technical services will be utilized as scheduled in the Project Paper.
- e. That arrangements will be made to ensure that adequate numbers of qualified candidates for training are available to fill the positions as scheduled and that the seven candidates for the international academic training will be identified within 6 months following execution of the loan agreement.

ANNEXES

AGRICULTURAL RESEARCH II

UNCLASSIFIED Page 2 of _____
Classification

MRN

(C) STAFF RETENTION. PP SHOULD CONTAIN FULL ANALYSIS OF WORK ENVIRONMENT AND SALARY/CAREER INCENTIVES AFFECTING CAPACITY OF CENTERS TO OBTAIN AND RETAIN TRAINED. COMPETENT PERSONNEL.

(D) ECONOMIC ANALYSIS. BELIEVE PP SHOULD PROVIDE BOTH IRR CALCULATION AND DISCUSSION OF INCOME/EQUITY/EMPLOYMENT CONSIDERATIONS.

(E) LOG FRAME AND EVALUATION. SUGGESTED REVISED LOGFRAME ALSO BEING FORWARDED SEPARATELY. SOME CONCERN EXPRESSED THAT PROPOSED EVALUATION PLAN PLACED TOO MUCH EMPHASIS ON INPUT/OUTPUT ACHIEVEMENT AND DID NOT PLACE ADEQUATE FOCUS ON ACHIEVEMENT AT PURPOSE LEVEL.

3. ALSO FORWARDING TA/AGR MEMO ON PRP FOR MISSION CONSIDERATION IN PREPARATION OF PP.

VANCE

BT

Ps

Certified copy
from a xerox copy:

A handwritten signature in black ink, appearing to be 'J. B. T.', is written over a horizontal line.

UNCLASSIFIED
Classification

THE AGRICULTURAL RESEARCH CENTERS
UNDER THE PROPOSED A.I.D. LOAN II

A. Multi-Commodity National Research Centers

1. Central Luzon State University (CLSU)

Location: Munoz, Nueva Ecija
Area: 700 hectares
Staff: PhD - 20
MS - 74
BS - 189 283

2. University of the Philippines at Los Banos (UPLB)

Location: Los Banos, Laguna
Area: 780 hectares
Staff: PhD - 189
MS - 199
BS - 137 525

3. Visayas State College of Agriculture (VISCA)

Location: Baybay, Leyte
Area : 1 000 hectares
Staff : PhD - 12
MS - 36
BS - 73 121

4. University of Southern Mindanao (USM)

Location: Kabacan, North Cotabato
Area: 1,000 hectares
Staff: PhD - 7
MS - 39
BS - 102 148

B. Single Commodity Research Center

1. Forest Research Institute (FORI)

Location: Los Banos, Laguna
Area: 50 hectares
Central Headquarters and main laboratories
Staff: PhD - 6
MS - 16
BS - 170 192

C. Regional Research Centers

1. Mariano Marcos State University (MMSU)

Location: Batac, Ilocos Norte
Area: 150 hectares
Staff: PhD - 4
MS - 12
BS - 35
DVM - 2 53

2. Cagayan Valley Institute of Technology (CVIT)

Location: Cabagan, Isabela
Area : 380 hectares
Staff : PhD - 4
MS -- 10
BS - 30
DVM - 1 45

3. Palawan National Agricultural College (PNA C)

Location: Aborlan, Palawan
Area: 327 hectares
Staff: MS - 20
BS - 35 55

ANNEX C
1 page only

Research Equipment Proposed
(See separate booklet)

PHILIPPINE COUNCIL FOR AGRICULTURE AND RESOURCES RESEARCH

COST ESTIMATES OF INFRASTRUCTURE SELECTED FOR FUNDING AT THE
DIFFERENT RESEARCH CENTERS

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>I. Central Luzon State University (CLSU)</u>							
<u>Proposed Loan Financed</u>							
1. Animal Science Research Laboratory	1,500	159	238	12	47	8	305
2. Carabeof Ranch Development and Utilities	-	-	240	12	48	-	300
Sub-Total			478	24	95	8	605
<u>Proposed GOP Financed</u>							
1. 4 Corrals and Shed	400	80	32	2	6	-	40
2. Auditorium/Seminar Workshop Building	1,200	225	270	13	54	-	357
3. Feed Bodega	300	110	33	2	6	-	41
Sub-Total			335	17	66	-	418
Total-CLSU			813	41	161	8	1,023

PROJECTS	AREA (Sq.M.)	UNIT COST (₱)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

II. University of the
Philippines at
Los Baños (UPLB)

Proposed Loan Financed

1. Gen Bank Building	2,000	207.50	415	22	83	12	532
2. Experimental Farm Development (IPB)	200 Ha.	2,670	534	26	107	-	667
Sub-Total			949	48	190	12	1,199

Proposed G.C.I. Financed

1. Experimental Farm Development (CES)	75Ha.	2,427	162	9	37	-	228
2. Greenhouse	500	120	60	3	12	-	75
3. Screenhouse	500	76	38	2	8	-	48
4. Service-Engineering Building	1,000	100	100	5	22	3	130
Sub-Total			360	19	79	3	489
Total-UPLB			1,337	67	269	15	1,688

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	COSTING AGENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

III. Visayas State College
of Agriculture (VisCA)

Proposed Loan Financed

1. Crop Research Laboratory	1,200	175	210	11	42	6	269
2. Experimental Farm Development	50ha.	2	100	5	20	-	125
3. Greenhouse	432	144	62	3	12	-	77
4. Screenhouse	432	88	38	2	8	-	48
5. 10 units 2-BR House	900	136	122	6	25	-	153
Sub-Total			532	27	107	6	672

Proposed GOP Financed

1. Crop Processing and Storage Research Labora- tory	500	174	97	4	18	3	112
2. Experimental Pasture	150ha,	533	80	4	16	-	100

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFES- SIGNAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>ViSCA (Cont'd.)</u>							
3. 5 units 3-BR House	650	137	89	4	18	-	111
4. Service Engineer- ing Building	1,000	135	133	7	28	4	177
5. Fertilizer/ Chemical Storage	120	125	15	1	3	-	19
6. Feedmill & Bodega	450	31	14	1	3	-	18
7. Seed Storage Room	20	100	2	0.12	0.48	-	3
8. Headhouse	350	149	52	3	10	-	65
9. 3 units 4-BR Apt.	900	109	98	5	19	-	122
10. Duck Shed	175	80	14	1	3	-	18
11. Cattle Shed	175	80	14	1	3	-	18
12. Housing Area Development	10ha.	5,400	54	3	11	-	68
13. Water Reservoir	2ha.	13,500	27	2	5	-	34

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
ViSCA (Cont'd.)							
14. Water Supply System Improve- ment	-	-	60	3	12	-	75
Sub-Total			<u>744</u>	<u>39.12</u>	<u>149.48</u>	<u>7</u>	<u>940</u>
Total-ViSCA			<u>1,276</u>	<u>69.12</u>	<u>256.48</u>	<u>13</u>	<u>1,612</u>

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFESS- SIGNAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

IV. University of Southern Mindanao (USM)

Proposed Loan Financed

1. Greenhouse	216	133	29	1	6	-	36
2. Screenhouse	216	83	10	1	4	-	23
3. 10 units 2-Bl. House	900	129	115	0	23	-	145
Sub-Total			163	6	33	-	204

Proposed GOP Financed

1. 5 units 3-Bl House	650	129	84	4	17	-	105
2. Auditorium/Seminar Workshop Building	1,200	229	275	14	55	-	344
Sub-Total			359	18	72	-	449
Total-USM			522	24	105	-	653

PROJECTS	AREA (Sq.M.)	UNIT COST (3)	ESTIMATED COST (3000)	PROFES- SIONAL FEES (3000)	CONTIN- GENCY (3000)	FURNITURE COST (3000)	TOTAL COST (3000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

V. Forest Research
Institute (FORI)

Proposed Loan Financed

1. Greenhouse	432	130	50	3	11	-	70
2. Water Supply System Improvement	-	-	107	5	21	-	133
Sub-Total			163	8	32	-	203

Proposed GOP Financed

1. 10 units 3-BR House	1,300	120	156	0	31	-	195
2. Laborers Quarters	100	100	10	0.40	2	-	12
3. 4 units 4-DR Apt.	1,200	88	106	5	21	-	132
Sub-Total			272	13.40	54	-	339
Total-FORI			435	21.40	86	-	542

Total for First Five (5) Centers (CLSU,
UPLB, VISCA, USM, & FORI)

Proposed Loan Financed			2,235	115	457	26	2,831
Proposed GOP Financed			2,090	106.6	420.4	10	2,632

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROCES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

VI. Palawan National
Agricultural College
(PNAC)

1. Crop Research Laboratory	1,500	158	282	14	56	9	361
2. Experimental Farm Develop- ment	50ha.	2,160	108	5	22	-	135
3. Greenhouse	216	153	33	2	6	-	41
4. Screenhouse	216	93	20	1	4	-	25
5. Water Supply System	-	-	52	3	12	-	77
6. Power Distribution System Improvement	-	-	160	3	32	-	200
Sub-Total			665	33	132	9	839

Proposed GOP Financed

1. 2 units 3-BR House	260	146	38	2	7	-	47
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PROJECTS	AREA (Sq.M.)	UNIT COST (₹)	ESTIMATED COST (₹000)	PROFES- SIONAL FEES (₹000)	CONTIN- GENCY (₹000)	FURNITURE COST (₹000)	TOTAL COST (₹000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>PNAC (Cont'd.)</u>							
2. Physical Plant Compound	2,000	160	320	16	64	-	400
3. 2 units 4-DB Apt.	600	117	70	3	14	-	87
4. Guesthouse	370	151	56	3	11	-	70
5. Housing Area Development	5ha.	5,800	29	1	6	-	36
6. Farm Building & Structure	-	-	27	2	5	-	34
Sub-Total			<u>540</u>	<u>27</u>	<u>107</u>	<u>-</u>	<u>674</u>
Total-PNAC			<u>1,205</u>	<u>36</u>	<u>239</u>	<u>9</u>	<u>1,513</u>

PROJECTS	AREA (Sq.M.)	UNDEF COST (P)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

VII. Mariano Marcos
State University
(MSU)

Proposed Loan
Financed

1. Crop Research Laboratory	1,500	163	244	12	49	7	312
2. Experimental Farm Develop- ment	50ha.	1,340	92	5	18	-	115
3. Greenhouse	216	134	29	1	6	-	36
4. Screenhouse	216	83	13	1	4	-	23
5. 3 units 2-BR House	720	131	24	5	10	-	117
Sub-Total			477	24	95	7	603

Proposed GOP
Financed

1. 2 units 3-BR House	260	131	34	2	7	-	43
2. Seed Storage Room	20	100	2	0.10	0.40	-	3

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>MMSU (Cont'd.)</u>							
3. Headhouse	520	146	76	4	15	-	95
4. 3 units 4-DR Apt.	900	100	90	5	18	-	113
5. Guesthouse	370	132	49	2	10	-	61
6. Housing Area Development	5ha.	5,200	26	1	5	-	32
7. Power Distribu- tion System Improvement	-	-	120	6	24	-	150
8. Water Supply System Improve- ment.	-	-	72		14	7	90
Sub-Total			<u>469</u>	<u>24.10</u>	<u>93.40</u>	<u>-</u>	<u>587</u>
Total-MMSU			<u>940</u>	<u>30.10</u>	<u>189.40</u>	<u>7</u>	<u>1,190</u>

PROJECTS	AREA (Sq.M.)	UNIT COST (₱)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

VIII. Cagayan Valley
Institute of
Technology (CVIT)

Proposed Loan
Financed

1. Crop Research Laboratory	1,500	161	242	12	49	7	310
2. Experimental Farm Develop- ment	50ha.	1,340	92	5	18	-	115
3. Greenhouse	216	134	29	1	6	-	36
4. Screenhouse	216	85	18	1	4	-	23
5. 2 units 3-Bd House	260	131	34	2	7	-	43
6. Water Supply System Improvement	-	-	80	4	16	-	100

PROJECTS	AREA (Sq.M.)	UNIT COST (C)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>CVIT (Cont'd.)</u>							
7. Power Distribu- tion System Improvement	-	-	42	2	8	-	52
Sub-Total			537	27	108	7	679
<u>Proposed GOP Financed</u>							
1. Greenhouse	150	131	21	1	4	-	26
2. 10 units 2-BR House	900	131	110	5	24	-	148
3. Service-Engineer- ing Building	1,000	128	128	0	20	4	154
4. Fertilizer/ Chemical Storage	120	117	14	1	3	-	18
5. Seed Storage Room	20	100	2	0.12	0.48	-	3
6. Animal Research Laboratory	1,200	161	193	10	38	6	247

PROJECTS	AREA (Sq.M.)	UNIT COST (C)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
<u>CVIT (Cont'd.)</u>							
7. Forage Research Laboratory	350	160	56	3	11	2	72
8. Forestry Research Labora- tory	300	163	49	2	10	1	62
9. Headhouse	520	140	76	4	15	-	95
10. 3 units 4-DR Apt.	900	100	90	4	18	-	112
11. Guesthouse	370	132	49	2	10	-	61
12. Housing Area Development	5ha. 5,000		25	1	5	-	31
13. Water Reservoir	2ha. 13,000		26	2	5	-	33
Sub-Total			<u>347</u>	<u>42.12</u>	<u>159.48</u>	<u>13</u>	<u>1,072</u>
Total-CVIT			<u>1,304</u>	<u>69.12</u>	<u>277.48</u>	<u>20</u>	<u>1,751</u>

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	CONTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

IX. PCARR National Head-
quarters and
Secretariat (PHHS)

Proposed GOI Financed

1. 12 units 3-BR House	1,560	120	187	9	38	-	234
2. 10 units 4-BR Apt.	3,000	38	264	13	53	-	330
3. 1 Guesthouse	370	114	42	2	8	-	52
4. Housing Area Development	5ha. 4,400		22	1	5	-	28
5. Water Supply System Improvement	-	-	72	4	14	-	90
6. Power Distribution System Improvement	-	-	120	6	24	-	150
<u>Total-PHHS</u>			<u>737</u>	<u>35</u>	<u>142</u>	<u>-</u>	<u>884</u>

PROJECTS	AREA (Sq.M.)	UNIT COST (\$)	ESTIMATED COST (\$000)	PROFES- SIONAL FEES (\$000)	JOINTIN- GENCY (\$000)	FURNITURE COST (\$000)	TOTAL COST (\$000)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)

Total for the last 4-
Centers
(PMAC, NRSU, CVIT, PMS)

<u>Proposed Loan Financed</u>			1,670	34	335	23	2,121
<u>Proposed GOT Financed</u>			2,569	128.82	511.88	13	3,216

GRAND TOTAL (For 9
CENTERS):

<u>Proposed Loan Financed</u>			3,954	199	792	49	5,002
<u>Proposed GOT Financed</u>			4,681	254.82	932.28	23	5,849

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 75 to FY 84
Total U.S. Funding \$10M
Date Prepared

Project Title & Number: Agricultural Research II, No. 97-0296

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS																																																
<p>Program or Sector Goal: The broader objective to which this project contributes: (A-1)</p> <p>Goal: National self-sufficiency in key agricultural commodities suitable for production.</p> <p>Sub-goal: Increase productivity and income of small farmers.</p>	<p>Measures of Goal Achievement: (A-2)</p> <ol style="list-style-type: none"> 1. Agricultural imports (excluding \$618.6 million in 1974) will be reduced. 2. FX earnings being generated from export of cotton surplus commodities. 3. Small farmer profits on key commodities increased by 10 percent by 1980. 4. Increased amount and variety of food available in rural and urban markets. 5. Steady increase in average yields per hectare of 3 percent per year for basic food crops after 1980. 	<p>(A-3)</p> <ol style="list-style-type: none"> 1. Foreign trade records 2. Export records of NGA 3. Ministry of Agriculture economic surveys and records. 4. Food Terminal records. 	<p>Assumptions for achieving goal targets: (A-4)</p> <p>Favorable weather conditions Supporting policies, well defined and consistent Small farmers will have access to agricultural inputs, services and credit required for significant production increases Steadily growing working relationship and research planning and extension entities</p>																																																
<p>Project Purpose: (B-1)</p> <p>Increase national and regional agricultural research activities carried out on key commodities produced by small farmers - rice, corn, sorghum, soybeans and other legumes, root crops, vegetables, meat and fish.</p>	<p>Conditions that will indicate purpose has been achieved: End-of-Project status: (B-2)</p> <ol style="list-style-type: none"> 1. Relevant national agricultural research policies formulated, applied, evaluated, and revised as necessary. 2. Major constraints to increased production of key commodities being identified, prioritized, analyzed and research programs to attack priority problems being mounted. 3. At least 150 research projects undertaken at national level and at least 60 research projects undertaken at regional research centers. 4. Research results published and information on new technology and methods flowing to small farmers. 	<p>(B-3)</p> <ol style="list-style-type: none"> 1. PCARR records 2. PCARR analytical reports 3. Research papers 4. Published research reports 5. Special studies 	<p>Assumptions for achieving purpose: (B-4)</p> <p>Constraints to significant yield increases in key commodities can be overcome through applied research Adequate GRF resources will be provided to support research and related efforts. Closer research-extension working relationships.</p>																																																
<p>Project Outputs: (C-1)</p> <ol style="list-style-type: none"> 1. PCARR in strengthened role as focus for national agricultural policy and program development, coordination, programming, and evaluation functions. 2. Specialized research flowing from national and regional research centers 3. Research flowing from related research organizations 4. Extension and data flowing to researchers 5. Transfer of research technology to existing personnel 	<p>Magnitude of Outputs: (C-2)</p> <ol style="list-style-type: none"> 1. PCARR fully staffed and operational 2. Five national and three regional research centers fully staffed and equipped. 3. Top quality researchers attracted to research centers 4. At least 12 related research organizations under taking agricultural research. 5. Research much more problem-oriented to small farmer needs 6. Faster local adaptation of technology from International Research Institutes. 7. A functioning information retrieval system established for PCARR in cooperation with UPLB, SEARCA, and IZRI 8. 320 technicians and related personnel trained. 9. Intensified research information for agricultural extension and its significant influence on the national and regional agricultural sectors. 	<p>(C-3)</p> <ol style="list-style-type: none"> 1. PCARR training, staffing and equipment records 2. Research centers staffing patterns, equipment and other physical property records 3. Research reports 4. Information system retrieval log and records 5. PCARR records on training 	<p>Assumptions for achieving outputs: (C-4)</p> <ol style="list-style-type: none"> 1. Related institutions will cooperate with PCARR and research centers, such as regional crop protection centers and technical/farmer training centers. 2. Research Centers can recruit and retain top quality researchers 3. Research Center Network will supply technology needs of regions by concentrating on their priority problems. 																																																
<p>Project Inputs: (D-1)</p> <p>Technical assistance Participant training Commodities and equipment Library materials Infrastructure costs</p> <p>Maintenance Research support Infrastructure Equipment</p>	<p>Implementation Target (Type and Quantity): (D-2)</p> <table border="1"> <thead> <tr> <th></th> <th>Year 1</th> <th>Year 2</th> <th>Year 3</th> <th>Year 4</th> <th>Year 5</th> </tr> </thead> <tbody> <tr> <td>Participant training</td> <td>458</td> <td>655</td> <td>510</td> <td>450</td> <td>32</td> </tr> <tr> <td>Equipment</td> <td>100</td> <td>2,080</td> <td>2,902</td> <td>-</td> <td>-</td> </tr> <tr> <td>Infrastructure costs</td> <td>20</td> <td>30</td> <td>143</td> <td>18</td> <td>-</td> </tr> <tr> <td>Subsistence</td> <td>315</td> <td>3,262</td> <td>3,036</td> <td>468</td> <td>16</td> </tr> <tr> <td>Research support inc.</td> <td>4,016</td> <td>4,243</td> <td>4,299</td> <td>3,716</td> <td>6,806</td> </tr> <tr> <td>Building maintenance</td> <td>2,100</td> <td>2,802</td> <td>3,849</td> <td>1,180</td> <td>750</td> </tr> <tr> <td>Infrastructure costs</td> <td>6,116</td> <td>7,345</td> <td>8,048</td> <td>7,016</td> <td>7,306</td> </tr> </tbody> </table>		Year 1	Year 2	Year 3	Year 4	Year 5	Participant training	458	655	510	450	32	Equipment	100	2,080	2,902	-	-	Infrastructure costs	20	30	143	18	-	Subsistence	315	3,262	3,036	468	16	Research support inc.	4,016	4,243	4,299	3,716	6,806	Building maintenance	2,100	2,802	3,849	1,180	750	Infrastructure costs	6,116	7,345	8,048	7,016	7,306	<p>(D-3)</p> <p>AGC project, financial and evaluation records</p> <p>UPP staff, budget, and project records</p>	<p>Assumptions for providing inputs: (D-4)</p>
	Year 1	Year 2	Year 3	Year 4	Year 5																																														
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OBJECTIVES, ORGANIZATION AND NATIONAL
NETWORK OF RESEARCH CENTERS OF PCARR

Objectives:

The Philippine Council for Agriculture and Resources Research was entrusted with the following tasks:

1. Define the goals, purpose, and scope of research in agriculture, forestry, and fisheries.
2. Develop a national research program based on a multi-disciplinary, inter-agency, and systems approach.
3. Establish a system of priorities for agriculture, forestry and fisheries research and a means of updating these priorities.
4. Establish a system to generate funds for agricultural research.
5. Program the allocation of all government revenues for agricultural research.
6. Provide a mechanism for updating the national research program.
7. Establish, manage, and fully support a national network of centers for the various commodity research programs.
8. Identify, evaluate, and review agricultural research programs.
9. Develop full communication among workers in research, extension, education, and national development.
10. Initiate the establishment of a repository of research information in agriculture, forestry and fisheries.
11. Provide for appropriate incentives to keep competent research scientists in the system.
12. Have authority and responsibility, as part of its scope of operations, over all government-supported and funded research on mineral resources except petroleum and other mineral oil.

13. Enter into agreement or relationships with other similar institutions and organizations, both national and international, in furtherance of the above purposes.
14. Have the power and authority to call on any department, bureau, office, agency, state university or college, commodity institute, and other instrumentalities of the government for assistance in the form of personnel facilities and other resources as the need arises in the discharge of its functions.

Organization:

PCARR is organized into three main bodies: Governing Council, Secretariat, and Technical Program Planning and Review Board.

A hard look at the organization reveals that PCARR is not a new research administration and technical staff working along a narrow aspect of development activity but that it involves the whole range of research, education and policy-making entities concerned with the total development of the country.

It brings together government and private sectors and marshalls the expertise of policy-makers, scientists, educators, and operators to find the most efficient ways of solving the problems of the nation.

The GOVERNING COUNCIL OF PCARR is composed of the Chairman of the NSDS (Chairman); the DA and DNR Secretaries as Vice-Chairman; the Agriculture Commissioner; a representative of the National Economic and Development Authority; the President of the Association of Colleges of Agriculture in the Philippines; the Chancellor of the University of the Philippines at Los Baños; the PCARR Director General, and two outstanding leaders in the producers' and business sectors of agriculture and natural resources to be appointed by the President of the Philippines upon recommendation of the PCARR Governing Council.

The composition of the Council provides a stable linkage to the national science structure of the country and at the same time assures responsiveness of PCARR to critical problems of agriculture and natural resources; ensures relevance to national development goals; and provides the participation of educational institutions and the private sector.

The SECRETARIAT implements the policies and guidelines formulated by the Governing Council. It is composed of the

Director General, the Deputy Director General for Programs and Operations; the Deputy Director General for Station Development; a Research Director for each of the seven research divisions which include crops, livestock, fisheries, forestry, soils and water, socio-economics, mines (except oil and petroleum); the Director for Technical Services; the Director for Administrative Services; and the Field Research Directors.

The top research administrators at PCARR are ten selected well-qualified individuals with strong research backgrounds. They see to it that the national research program in agriculture, forestry, fisheries and mines as crystallized through the PCARR mechanism, is implemented by more than 2,200 agricultural research workers in the country. They are assisted by some 100 full-time support staff members which include program specialists, research assistants, technical specialists, and administrative support staff.

PCARR makes effective use of the available research talent in the country by drawing on outstanding scientists to participate on an "on call" basis for planning, coordination, review and evaluation of the national research programs. Commodity research team leaders (31) each serve an average of one day a week or about 52 days a year. In addition, about 350 of the best available scientists in the country have been requested to serve as members of the different commodity research teams for approximately ten days a year.

This arrangement holds to a minimum the core leadership staffing for PCARR and provides for a broad dimension of involvement of the best scientific talent of the country in addressing critical problems in agricultural development without unnecessarily drain the manpower resources of other agencies.

Only 61.5 scientist man years, less than six percent of the reported actual time for research by all agricultural researchers of the country, were spent on research administration as a result of this arrangement. Against the total number of agricultural researchers in the country, research administration took up less than three percent of the total available research manpower.

The Director General oversees the overall function of the Secretariat. He is assisted by the two Deputy Directors-General.

The research directors formulate the national research program for their respective commodity areas. It is their responsibility to constantly plan, coordinate, review, evaluate and update the research programs together with the commodity

research team leaders and members, all of them top quality researchers from government and private institutions and serving part-time with PCARR.

Each research team is composed of scientists with specialization in the different aspects of each commodity. The National Corn and Sorghum Research Team for instance consists of a plant pathologist, grain processing specialist, weed control expert, marketing economist, animal utilization specialist, food expert, extension-education specialist, plant breeder, entomologist, crop physiologist, agronomist, and production economist.

The Director for Technical Services takes charge of the overall outreach program of PCARR which includes the Scientific Literature Service, subject matter specialists, public relations and information services, and extension support functions.

The Director for Administrative Services is responsible for the management staff and support personnel.

The Field Research Directors see to the proper conduct and implementation of research projects in the field stations comprising the national network of agricultural research centers and stations.

The Technical Program Planning and Review Board (TPPRB) reviews the national research programs of each of the 32 commodity industry groups as monitored by the PCARR research divisions. It is composed of the following: The Director-General of PCARR as Chairman; the Executive Director of the National Food and Agriculture Council (NFAC) as Vice-Chairman; the PCARR Deputy Director General for Programs and Operations as Ex-Officio Secretary.

Members

Director, Agro-Industries Projects Department-Board of Investment

Director, Agriculture Programs Office- National Economic Development Authority

Chief, Planning Service - National Science Development Board

Chairman, Agriculture and Forestry Division-National Research Council of the Philippines

Chief, Plans and Programs Services-Department of Natural Resources

Chief, Plans and Programs Services - Department of
Agriculture

Chief, Plans and Programs Services - Department of
Agrarian Reforms

Representative of the Nutrition Center of the Philippines

Representative of National Pollution Control Commission

Three research directors from universities and colleges

Three representatives from the agricultural business
sector preferably doing research work for industry
planning

Two representatives of the small farmers' group.

AGRICULTURAL RESEARCH AND EXTENSION FOR THE SMALL FARMERS

1. Concepts and On-Going Activities

A major problem confronting most Asian countries in their efforts of agricultural development is that agricultural research has not been oriented to solving farm problems.

In the Philippines, agricultural research is undergoing a process of redirection and is now geared toward finding solutions to the problems and needs of the small farmers which constitute the majority of the country's agricultural producers.

The Philippine Council for Agriculture and Resources Research (PCARR) has recognized that although several research institutions have scored many significant breakthroughs, the output of the small farmer has remained low when compared to that of the experimental farm or field testing stations, and that this has been caused by a 'missing link' in the transfer of technology from scientist to farmer. Hence, the present efforts to set up an effective mechanism for technology generation, verification and dissemination.

The concept of technology generation, verification and dissemination provides that all three processes are components of a continuum, and these components should move in one direction to effect complete transfer from source (scientist/researcher) to end-users -- the small farmer.

The salient features of the mechanism for technology generation, verification and dissemination which PCARR is institutionalizing in close collaboration with the NEDA and the extension agencies are as follows:

Technology Generation

1. Commodity research and development program -- 32 commodity research teams, 27 at the micro level and 5 at the macro level are in operation to make the national research program more responsive to and representative of Philippine agriculture and natural resources. These national commodity programs involve the identification of a principal or lead research station for each commodity and a network of cooperative stations, each of which must be located close to the small farmers involved in producing the commodity.
2. Borrowed technology -- an interdisciplinary corps of scientists provides the expertise to verify and/or adapt relevant technology developed in other countries.

Technology Verification

Technology generated by local agricultural research or borrowed from other sources can only be viable if it is adapted and made responsive to local conditions. New technology is now being verified on a location-and situation-specific basis before it is widely disseminated to the farmers.

Institutions which will do regional testing have been identified. Testing on farmer's fields of pilot program packages are planned. Annex "I" shows the network of research centers by commodity together with that of locations identified for on-farm trials.

Technology Dissemination

The three most important aspects of technology dissemination are: a) farm demonstrations; b) extension and c) acceptance of technology by the farmer.

The present use of farm demonstrations, agricultural extension efforts and the level of acceptance/adoption of technology by the small farmer have been identified by the research community and will be used as a basis for planned improvements on these aspects of dissemination. The efforts to extend technology to the small farmers is presently reflected in the research programs and projects being undertaken by the national research centers. Examples are:

The University of the Philippines at Los Banos (UPLB) has a pilot project on vocational education for out-of-school youth and adult farmer's education, a unified applied rice research, research training and extension programs for abaca, multiple cropping, upland and vegetable crops and several other projects addressed to the problems and needs of the small farmers.

The Forest Research Institute (FORI) has on-going research projects directed to the interest of small farmers. Examples are: inter-cropping of fast-growing species with annual agriculture crops; livestock production in forest plantations established in range areas; farming systems; and effect of different vegetative covers on soil erosion. It has also research proposals under review in the economics of small scale goat-raising in forest range areas; research and development of agro-forestry for upland kaingin (slash-burn) farmers; economic and sociological evaluation of tree farming program in Surigao del Sur; and socio-economic evaluation of the BFD family-approach scheme of reforestation in Bukidnon.

The Central Luzon State University (CLSU) is implementing the Integrated Agricultural Production and Marketing Project (IAPMP), a joint venture of the GRP and AID. It is a "total food system approach" involving the development of an integrated agriculture production and marketing capability of a target population in Nueva Ecija province, aimed at increasing small farmer productivity and improving the efficiency in the market system. One IAPMP major project is the Tech Pack Project (TPP) which is a research technological testing activity aimed at generating/verifying technological packages which integrate cooperatives, livestock enterprises, product processing and marketing systems which will meet the needs of farm families within the target population.

The Visayas State College of Agriculture (VISCA) is undertaking research projects for the improvement of the social status of small farmers such as agronomic studies of root crop farmers and their social status; assessment of credit availed of by coconut farmers; study of food habits of Visayan people; the role of women in rural development in Leyte and other similar studies. For the improvement of small farmers' productivity apart from agriculture, VISCA is undertaking research on design and commercialization of abaca twine handbags and design and development of coconut handicrafts. Studies on the planting methods for optimization of sweet potato and cassava yields, cultural management studies of on-farm trials of major root crops and under coconuts and other cultural research projects are underway by VISCA for the improvement of production technology of small farmers.

The University of Southern Mindanao (USM) is implementing the following research projects to help the small farmers in the region solve their problems: extension technology research on crops and livestock; multiple studies in rubber; regional rubber clone trial; survey on disease of rubber in Mindanao; study on the status of rubber industry in the Philippines; and studies on culture and production management of upland crops (rubber production is a small farmer enterprise in Southern Mindanao).

PCARR is cognizant of the need to improve both generation and transfer of technology and that a transfer system to farmers can never be of value unless preceded by technology generation and verification. PCARR recognizes and has adopted the concept that to be relevant, research should start and end with the farmer. To that end they are attempting to obtain inputs from farmers in identifying the technology needed and the problems encountered in applying new technology by farmers. The conceptual model presented by Dr. Basilio N. de los Reyes illustrates the directions now being pursued.

An excellent example of success in applied research results moving to the farm is the outreach program of IRRI, PCARR and the Bureau of Agricultural Extension (BAEX) in cropping systems under rainfed conditions now underway in Sta. Barbara, Iloilo. This project, sometimes called the Iloilo Pilot Extension Project or KABSAKA grew out of three successive years of cooperative applied research on cropping systems conducted by IRRI, PCARR and BAEX starting in 1974.

The project started with two farmer cooperators in two barangays. The total area was 2000 square meters. From this area they produced 1.9 metric tons (9.5 metric tons/hectare). A field day and a concentrated information outreach program was conducted among farmers of the area.

In the second year, 1975, nine farmers attempted the new technology which was applied to 25 hectares of double crop rice.

The third year fifty-four farmers joined the program and applied the new

technology to 89 hectares of double crop rice and four farmers planted a third crop.

In 1977, 203 farmers in 9 barangays joined the program and applied the technology to 450 hectares with an average rice yield of 83 cavans (4.15 metric tons) per hectare as compared to a previous average of 35 cavans (1.75 metric tons) per hectare.

The experience of one of the original cooperators, Mr. J. Sobarnizo of barangay TigTig illustrates the magnitude of achievement. Mr. Sobarnizo owns 4 hectares of unirrigated land. Prior to KABSAKA, he planted rice once a year in June and harvested an average of about 35 cavans per hectare, grossing about ₱6,000.

In 1976 he harvested 2 crops of rice totaling 500 cavans and followed the second crop with 2 hectares of corn, 1 hectare of mungbeans and 1 hectare of peanuts. He obtained 30 cavans of corn, 5 cavans of mungbeans and 5 cavans of peanuts. His gross income was:

rice	- ₱21,000
corn	- 2,250
mungbeans	- 1,500
peanuts	- <u>750</u>
Total Gross	- ₱25,500

In 10 months his gross income (₱ 25,500) exceeded his previous income from a single crop of rice (₱6,000) from the same land by a factor of 4.2. After deducting inputs of ₱10,000 his return was approximately ₱15,000 or 2.5 times greater than his previous gross income. Moreover, Mr. Sobarnizo learned the value of credit and technology while serving as an example for neighboring farmers.

This achievement was the combined result of research, extension, cooperation and much planning. The strategy followed included:

1. Farmer participation in determining the technology needed and cooperating in the applied research;
2. A sustained flow of advice on crop cultural techniques, farm planning, budgeting, and credit to the farmers;
3. Ensuring production inputs were available for sale in the near vicinity; and
4. The National Grains Authority (NGA) assured a market.

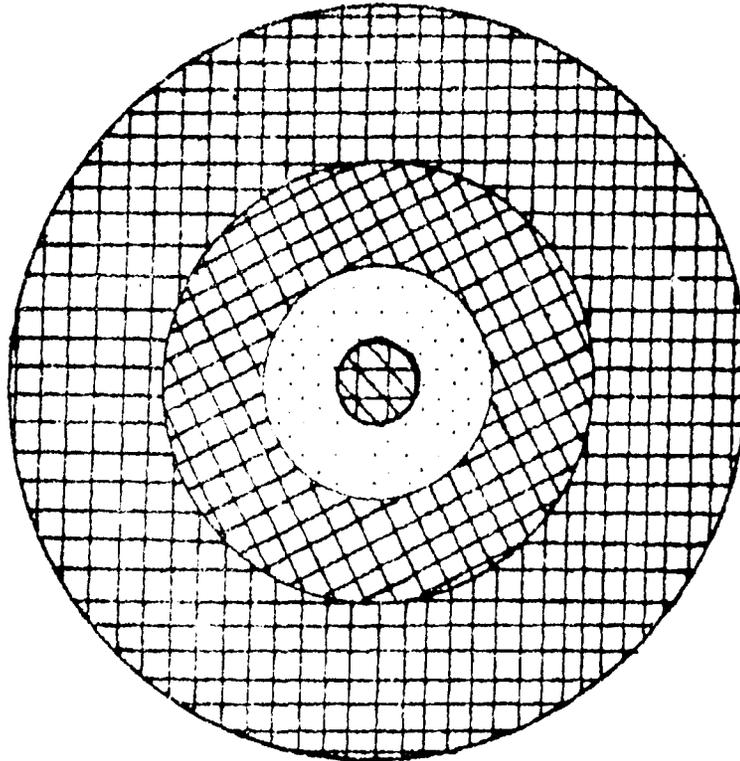
Since about 70 percent of the rice growing area in the Western Visayas is unirrigated, i.e., dependent upon monsoon rains for moisture, and produces only one crop yielding 1.5 to 3.0 metric tons per hectare, plans have been made to expand the KABSAKA to additional areas. Criteria for selection of priority municipalities have been established and 11 new areas in 6 provinces have been selected where the program will be attempted. The goals for 1978 are 2,500 hectares producing an average of 4 tons of rice/hectare per crop (8 tons/hectare per year) with other crops to be grown after rice. Demonstration plots will be conducted in each area.

Tied in with this Outreach Program are:

1. Encouraging each participating farmer to grow a home garden and/or raise poultry for home consumption;
2. Assignment of a Home Management Technologist and Rural Youth Development Officer to work in the barangays on the following tasks:
 - a. Survey population (families, sex of members, age);
 - b. Survey of pre-schoolers;
 - c. Survey of pregnant women, infants and third degree malnourished pre-schoolers;
 - d. Organize homemakers classes;
 - e. Collect monthly weight data on infants and quarterly data on malnourished pre-schoolers;
 - f. Establish supplementary mix preparation center for infants and malnourished pre-schoolers;
 - g. Organize an RJC child center;
 - h. Encourage family planning;
 - i. Encourage home and community food production project;
 - j. Organize rural clubs among out-of-school youth and establish backyard gardening;
 - k. Establish livestock and poultry projects among the youth.

A graphic summary of the multiplier effect achieved in the initial pilot project follows.

**A Graphic Illustration of a Multiplier
Effect on Rainfed Rice at Sta. Barbara Iloilo**



Legend:

-  - 1st year (1974-75) 2 farmers with .266 ha. and a total production of 56 cavans
-  - 2nd year (1975-76) 9 farmers with 25 has. and a total production of 4,960 cavans
-  - 3rd year (1976-77) 54 farmers covering an area of 89 has. and a total production of 16,396 cavans
-  - (1977-78) 203 farmers covering an area of 150 has. with a total production of 427,5 cavans

2. Present Agricultural Land Utilization and Production Status:

The Philippines has a total area of 10,750,989 hectares devoted to agriculture of which 71% (7,624,620 ha) is planted to food crops and the remaining 29% (3,126,369 ha) planted to commercial crops, (BAECON figures 1976).

Rice, the most important staple crop raised by Filipino farmers is grown extensively in every region of the country. Latest figures, for 1977 show that about 3.5 million hectares were planted to rice representing 33% of the total hectarage (food and commercial crops). Of this total rice area, 1.5 million hectares represent the irrigated area, and 2.0 million hectares rainfed area (lowland rainfed and upland).

The total palay production in 1977 was placed at 6,456,075 M.T. Production under irrigated area was placed at 54% (3,494,005 M.T.) and the remaining 46% (2,062,070 M.T.) was produced in the rainfed area, registering an average yield of 2.34 and 1.43 M.T./ha respectively. The national average is 1.82 M.T./ha compared to experiment station yield data of 5 to 8 tons/ha.

Corn is one of the important agricultural crops being produced for human food and animal feed in the country. However, inspite of our favorable climate and available production technology developed in experiment stations showing high yields, our corn requirement for food, feed, seed and industry are not yet met. The Bureau of Agricultural Economics reported that in 1977, a total of 2,843,430 M.T. was produced from 3,320,000 ha, registering a national average yield of 0.85 M.T./ha while it has been demonstrated that yield of 2.64 to 3 tons/ha can be achieved in experiment stations.

In the case of vegetable production in the country, the Bureau of Agricultural Economics also reported that in 1977, an aggregate area of 56,190 ha was planted with a production of 370,075 M.T., placing the national average at 6.58 M.T./ha.

**Area and Average Farm Size and Number of Farms of
Various Crops Philippine Census Year 1971**

<u>CROP</u>	<u>AREA</u> <u>(Has.)</u>	<u>AVE. SIZE</u> <u>(Has.)</u>	<u>NO. OF FARMS</u>
All Farms	8,493,735	3.61	2,354,469
Palay	2,661,150.2	2.71	981,915
Corn	1,493,891.1	2.91	514,175
Coconut	2,152,776.1	4.98	432,486
Vegetables	16,126.4	1.90	8,475

Source: Census of Agriculture, 1971

Targets of Agricultural Research/Production

As cited earlier the targets of agricultural research are two fold: To increase national production and to escalate small farm productivity and prosperity.

The following tables present the target figures of production for the mid 80's. There are projected increments in average farm yield and total production for rice, corn, coconut and vegetable.

The number of farmers that can benefit from the results of research has also been estimated.

Regional Research Projects for Rice by Yield Category,
Production, and Increment from 1978 - 1986

COMMODITY: Rice

R E G I O N	CURRENT STATUS ^{a/}			PROJECTED TARGETS ^{b/}			INCREMENT ^{c/}	
	AREA	YIELD/HA.	PRODUCTION	YIELD/HA.	PRODUCTION	YIELD/HA.	PRODUCTION	
								(000 HA.)
Philippines	3,547	1.82	6,456	3.0	11,760	1.18	5,303	
I. Ilocos Region	310	1.64	511	2.90	1,087	1.26	576	
II. Cagayan Valley	433	1.88	813	2.95	1,351	1.07	538	
III. Central Luzon	412	2.51	1,036	3.21	1,618	0.7	582	
IV. Southern Tagalog	456	1.79	820	2.90	1,337	1.11	517	
V. Bicol	334	1.97	652	2.90	1,076	0.93	418	
VI. Western Visayas	474	1.88	895	2.90	1,424	1.02	529	
VII. Central Visayas	89	1.50	132	3.15	309	1.65	177	
VIII. Eastern Visayas	181	1.29	233	3.00	594	1.71	361	
IX. Western Mindanao	144	2.22	319	3.30	508	1.08	189	
X. Northern Mindanao	158	1.27	200	3.15	1,087	1.88	887	
XI. Southern Mindanao	155	1.88	311	3.05	756	1.17	445	
XII. Central Mindanao	392	1.34	528	3.00	-	1.66	-	

a/ Source of data, BAEcon Statistics, 1977

b/ Computed yield and production targets as of the year 1986, Projected targets based on 1977 statistics

c/ Computed increment for yield per hectare and total production per region

Regional projections for corn by yield category, production and increment - 1978 to 1986.

COMMODITY: Corn

R E G I O N	CURRENT STATUS ^{a/}			: PROJECTED TARGETS ^{b/} :		INCREMENT ^{c/}	
	:			:		:	
	AREA : (600 HA.)	YIELD/HA.: (M.T.)	PRODUCTION :(000 M.T.)	YIELD/HA.: (M.T.)	PRODUCTION :(000 M.T.)	YIELD/HA.: (M.T.)	PRODUCTION (000 M.T.)
Philippines	3,321	0.85	2,843	1.79	5,945	0.94	3,102
I. Ilocos Region	46	0.55	26	0.90	41	0.35	15
II. Cagayan Valley	350	0.82	286	1.59	557	0.77	271
III. Central Luzon	50	0.71	35	1.5	75	0.79	40
IV. Southern Tagalog	295	0.99	292	2.0	590	1.01	298
V. Bicol	156	0.61	95	1.25	195	0.64	100
VI. Western Visayas	232	0.64	149	1.25	290	0.64	141
VII. Central Visayas	485	0.50	241	0.88	427	0.38	186
VIII. Eastern Visayas	150	0.81	122	0.88	132	0.07	10
IX. Western Mindanao	210	0.68	143	1.9	399	1.22	256
X. Northern Mindanao	193	0.52	101	1.9	367	1.38	266
XI. Southern Mindanao	730	1.24	911	2.45	1,789	1.21	878
XII. Central Mindanao	423	1.05	443	2.45	1,036	1.40	593

a/ Source of data: B.Econ Statistics, 1977.

b/ Computed yield and production targets as of the year 1986.

c/ Computed increment for yield per hectare and total production per region.

Regional projections for coconut by yield category production and increment from 1978 to 1986.

COMMODITY: Coconut

R E G I O N	CURRENT STATUS ^{a/}			PROJECTED TARGETS ^{b/} (1986)			INCREMENT ^{c/}	
	AREA	YIELD/HA.	PRODUCTION	YIELD/HA.	PRODUCTION	YIELD/HA.	PRODUCTION	
	(000 M.T.)	(M.T.)	(000 M.T.)	(M.T.)	(000 M.T.)	(M.T.)	(000 M.T.)	
Philippines	2,714	1.11	3,013	1.67	4,532	0.56	1,519	
I. Ilocos Region	13	1.39	19	1.74	23	0.35	4	
II. Cagayan Valley	5	1.52	8	1.90	10	0.38	0.54	
III. Central Luzon	.75	0.82	0.6	1.52	1.14	0.7	0.1	
IV. Southern Tagalog	442	0.88	389	1.52	672	0.64	283	
V. Bicol	259	0.35	91	1.52	394	1.17	303	
VI. Western Visayas	87	1.36	118	1.74	151.3	0.38	33.3	
VII. Central Visayas	141	0.79	192	1.52	214.3	0.73	22.3	
VIII. Eastern Visayas	354	1.07	379	1.28	453	0.21	74	
IX. Western Mindanao	332	1.55	515	1.82	604	0.27	89	
X. Northern Mindanao	367	1.11	407	1.28	469.7	0.17	62.7	
XI. Southern Mindanao	476	2.05	976	2.40	1,142.4	0.35	166.4	
XII. Central Mindanao	236	1.58	373	1.84	434	0.26	61	

a/ Current Status based on BAEcon Statistics, 1977.

b/ Projected targets made based on 1977 Statistics.

c/ Computed increment.

Regional Projections for Vegetables by Yield Category,
Production and Increment from 1973 - 1986

COMMODITY: Vegetables

	CURRENT STATUS ^{a/}			PROJECTED TARGETS ^{b/}			INCREMENT ^{c/}	
	AREA	YIELD/HA.:	PRODUCTION	YIELD/HA.:	PRODUCTION	YIELD/HA.:	PRODUCTION	
		(000 HA.):	(M.T.)	(000 M.T.)	(M.T.)	(000 M.T.):	(M.T.)	(000 M.T.)
Philippines	56	6.58	370	-	-	-	-	
I. Ilocos Region	15	4.58	69	10	150	5.42	81	
II. Cagayan Valley	2	4.75	11	-	-	-	-	
III. Central Luzon	12	6.47	78	10.83	130	4.36	52	
IV. Southern Tagalog	9	5.03	46	10.5	95	5.47	49	
V. Bicol	4	8.16	31	12.5	50	4.34	19	
VI. Western Visayas	3	11.89	35	-	-	-	-	
VII. Central Visayas	3	3.23	9	-	-	-	-	
VIII. Eastern Visayas	.77	11.18	9	-	-	-	-	
IX. Western Mindanao	.62	3.32	2	-	-	-	-	
X. Northern Mindanao	4	10.65	38	19.5	78	8.85	40	
XI. Southern Mindanao	4	7.50	28	-	-	-	-	
XII. Central Mindanao	-	6.28	355	-	-	-	-	

NOTE: Projected target for 1986 for yield and production were taken from the average target figure for garlic, onion, cabbage, and tomatoes.

- a) Current status based on BAEcon Statistics, 1977
- b) Projected targets made based on 1977 statistics
- c) Computed increment

3. GRP Efforts to Strengthen Extension Services and Training in Rural Areas

The Philippine Government is undertaking a very logical companion development program in the extension service with that of the development of the research capability of the national research system.

A multi-million dollar program to expand the agricultural extension service will be assisted by a loan from the World Bank. The primary objective of the program is to strengthen the Philippine agricultural extension service on the national, regional, provincial, district, municipal and barangay (village) levels. The goal is to increase the capability of the rural people by providing them the knowledge, competence and skills primarily through group and community learning activities, which would ultimately mean greater productivity of the farms and more self-reliant and healthy farm families. The objectives of the program in detail are:

- (a) Reorient the functions, programs and strategies of the agricultural extension system and make them more relevant to the needs of the time;
- (b) Development of rural institutions as venues for the extension delivery systems;
- (c) Establish an efficient and effective linkage among the research and extension systems;
- (d) Provide an efficient feedback mechanism and handling management information service; and
- (e) Development of a more effective support communication scheme.

For the Bureau of Agricultural Extension (BAEX) of the Ministry of Agriculture which will implement the extension service expansion, this would mean a five-year crash program costing over \$200 million, about one-sixth of which will be funded from the loan.

The strengthening of the extension service will be in terms of the following:

- (a) Infrastructure support - 75 pilot extension centers, one per province, and one training room for the Central Office in Metro Manila will be constructed;
- (b) Equipment support - equipment facilities for communication, transport, office and technical equipment for use of specialists will be increased and improved;
- (c) Manpower development:
 - (1) Clientelle training for farmers, home makers and rural youth is programmed for some 61,000 people;
 - (2) Continuing in-service training for existing and additional technicians will be intensified;
 - (3) The program will also cover degree (M.S. and Ph.D.) oriented training both foreign and in-country for about 200 technical personnel.
- (d) Extension manpower - The current extension force of the Bureau of 8,174 will be expanded to some 15,000 such that intensified technician supervision over farm management, home management and rural youth development would be strengthened at the following ratio:
 - Five (5) barangays (villages) per farm management technologist;
 - Ten (10) barangays (villages) per home management technologist; and
 - Twenty (20) barangays (villages) per rural youth development technologist

The target of the program is the total development of the farm family. The extension service along production technology will be extended to enterprise planning (agri-business) which will be concerned with the development of the overall managerial ability of the farmer and his family by improving their knowledge and skills.

The planning approach is the so-called "bottom up" type whereby the barangay program planning committee composed of the barrio captain as chairman and as members: the presidents of the farmers' associations, the rural improvement clubs, the 4-H clubs, representatives of civic and religious organizations, and opinion leaders who will prepare the integrated development program for the barangay under the guidance of the extension workers. The plan goes up to the district level, then to the provincial level, to the regional level, to the national office of the Bureau of Agricultural Extension (BAEx) and finally to the Ministry of Agriculture. In the process, the various existing development committees/councils on the municipal, provincial, and regional levels will be deeply involved.

The Philippine Training Centers for Rural Development
(PTC-RD)

This network of training centers which is administered at the University of the Philippines at Los Baños (UPLB) is an instrument for effective and sustained development of the rural areas by helping strengthen the agricultural extension service through the training of (a) technicians and (b) farmers.

The Regional Training Centers for Rural Development are located at:

- (1) The Isabela State University, Cagayan, Isabela
- (2) The Mountain State Agricultural College, La Trinidad, Benguet
- (3) Visayas State College of Agriculture, Baybay, Leyte
- (4) University of Southern Mindanao, Kabacan, North Cotabato
- (5) University of the Philippines at Los Baños

All these training centers are research centers in the PCARR national network of research centers and stations. The location of these training centers within the research centers is indeed a very logical tie-up.

The Farmers' Training Centers for Rural Development are located at:

- (1) San Mateo, Isabela
- (2) Sta. Barbara, Pangasinan
- (3) Naujan, Oriental Mindoro
- (4) Sab-a, Leyte
- (5) Midsayap, North Cotabato

The Extension Service for Fisheries

On the part of the Ministry of Natural Resources which has direct supervision over the Bureau of Fisheries and Aquatic Resources, fishery extension personnel have been increased to over 600 from less than half this number several years ago.

The specific strategies to be employed in the development of inland fisheries, municipal fisheries, commercial fisheries and fish processing extension services are as follows:

- (a) Improving extension program planning and implementation - This has four routes:
 - a) data gathering;
 - b) training and orientation;
 - c) actual field implementation;
 - and d) evaluation
- (b) Extension Literature Development - This will be improved in terms of quality and frequency of publication to keep the extension workers and clientele abreast of innovation in their respective fields.
- (c) Upgrading of Extension Workers - To enable the extension workers upgrade their skills, the following will be offered:
 - a) regular courses;
 - b) nationwide seminars;
 - c) training courses;
 - and d) meetings and conferences

The expanded extension service will strengthen the efforts towards:

- (a) Increasing yields of existing production units in aquaculture and capture fisheries;
- (b) Selectively expanding production units in aquaculture and capture fisheries;
- (c) Improving the fish marketing and distribution systems to minimize gaps between production and consumption on local and regional levels;
- (d) Providing ice plants, cold storage, processing plants and other shore facilities for efficient handling and distribution of fish and fishery products;
- (e) Reducing wastage and improving the quality of products that reach the consumers;
- (f) Developing foreign markets for traditional and non-traditional export fish and fishery products;
- (g) Developing processed products from indigenous fishery resources traditionally exported in raw or semi-processed form;
- (h) Developing local markets for import substitutes;
- (i) Encouraging establishment of fishery resource-based cottage industries and allied industries;
- (j) Enforcing fishery laws and regulations for the protection of fishery resources from illegal practices, over exploitation and pollution;
- (k) Continuing identification and establishment of fish sanctuaries, stocking of inland waters and other measures to enhance productivity of communal waters;
- (l) Promoting appropriate technologies for use and/or conservation of fishery resources

J. O. J. O.
18 OCT 78

Research Priorities

The national priority research rankings are developed with inputs from NEDA Regional and National Directors, the PCARR Secretariat, researchers from the Universities and Ministry of Agriculture, and individuals from the sector including farmers. The PCARR Governing Council provides the final review and approval.

The National rankings are based upon: 1) the relative importance of the commodity to the overall development of the country; and 2) the research needs of the commodity. Priority rankings are reviewed and updated every three years with the premise that appropriate changes can be made whenever such action is demanded by circumstances such as a scientific breakthrough or a crop disaster.

Since the commodity approach used in the rankings is not applicable to applied Social Sciences, priority of all studies on agricultural economics and rural sociology that involve a commodity have the same priority as the commodity. National studies cutting across commodity lines deemed by the Governing Council as critically important to agriculture and natural resources, such as macroeconomic studies on credit policies, irrigation policies, employment, income situation, etc., receive priority ranking.

The present national commodity research priorities are:

Priority - 1

- Aquaculture
- Corn and Sorghum*
- Vegetable* (tomato, cabbage, onion and garlic)
- Legumes* (soybeans, mungbeans, peanuts)
- Rootcrops* (sweet potato, cassava, white potato)
- Reforestation and Forest Watersheds
- Forage, Pastures and Grassland*

*Cropping systems are included

Because the list of specific on-going research studies in agriculture, forestry and fisheries totals 1565, a complete listing would be inappropriate for presentation in a Project Paper. Approved studies are recorded and each year PCARR publishes a directory of all completed and ongoing studies. A copy is made available to the USAID Mission.

For illustrative purposes, some of the on-going research studies in Regions III and IV-A are as follows:

Cereals

1. Selection and breeding of varieties resistant to major pests and diseases for rainfed areas. Involves corn, sorghum and rice.
2. Breeding varieties that are tolerant to flood submergence or drought tolerance.
3. Epidemiological and ecological studies of insects and diseases
4. Survey, inventory and assessment of regional pest problems.
5. Weed control in rainfed rice
6. Rodent control on lakeshore rice fields
7. Marketing system analysis
8. Regional testing of recommended crop protection schedules

Legumes

1. Varietal screening of soybeans, mungbeans, peanuts and cow peas.
2. Field testing of soybeans technology package in farmers fields.
3. Intercropping with legumes in coconuts and citrus.
4. Small scale processing and utilization of Badios and tapilan for food.
5. Soil amelioration and management systems for poor and sandy soils.

Root Crops

1. Socio-economic and marketing study of arrowroot, tugui, ubi and apulid.
2. Collection, evaluation and selecting for quality and yield of sweet potato varieties.
3. Feasibility of year-round production of sweet potato
4. Comparative value of storage techniques for root crops.
5. Socio-communication and agricultures innovativeness of root crops farmers

Vegetables

1. Cultural management studies on melons and onions.
2. Screening of insecticides and fungicides and least effective levels for vegetables
3. Pilot and production, processing, storage and distribution of onions, mustard, radish, melons and pechay.
4. Inhibition of sprouting and post-harvest storage of onion varieties
5. Fumigation for the control of melon fruit fly
6. Varietal collection and evaluation of pole beans and chayote
7. Biological control of Fusarium wilt of beans
8. Development of grade standards for vegetables
9. Packaging technology for vegetables

Coconuts

1. Performance of imported hybrids compared to local hybrids
2. Intercropping and analyses of cost/benefits
3. Fertilizer study on established and newly planted coconuts.

Fruits

1. Comparative yield study of banana varieties
2. Factors affecting yield and quality of papaya
3. Selection of superior avocado varieties
4. Citrus budwood registration
5. Selection of promising citrus cultivars
6. Disease vector relationship on citrus leaf mottling disease
7. Marketing prospects of selected fruits
8. Flowering-fruiting studies in rambutan
9. Maximizing utilization of calamansi and cooking bananas

Socio-Economic

1. Profile of coconut growers
2. Factors associated with adoption of high yielding varieties and practices
3. Womens role in sugarcane, coffee, cacao and the coconut industries
4. Improvement of Statistical data base.
5. Extension programs: design, strategies, policies, impact and problems
6. Assessment of rural organizations

Sericulture

1. Economic study on silk production
2. Product development
3. Sociological study on farmer acceptance of improved sericulture techniques
4. Utilization of silk by-products

Fisheries

1. Management of Candaba swamp through agro-fish farming!
2. Inventory of fish resources in inland waters
3. Pollution surveys of inland waters
4. Assessment of types of gear and fishing intensity
5. Socio-economic studies of the fishing communities
6. The effect of fish corrals in rivers
7. Feasibility of fish pen/cage culture in inland waters
8. Improvement of fishpond design and construction methods
9. Methods for increasing fry survival through improved handling and transport
10. Control of pond pests
11. The effects of pesticides residues in fishponds
12. Field testing of Tilapia nilotica
13. Integration of agro-fisheries

Livestock

1. Utilization of feed substitutes, waste by-products, industrial by-products and least cost ration formulation
2. Farming system involving livestock
3. Forage and pasture development
4. Financing and credit schemes
5. Assessing extension strategies

Soils/Water

1. Inventory of soil resources
2. Erosion/conservation studies

3. Assessing nutrient problems in major agricultural soils
4. Inventory and planning of drainage problem areas
5. Management and socio-economic studies in irrigated areas
6. Studies on water use by crops under different management and environmental conditions
7. Siltation and sedimentation of gravity irrigation systems
8. Comparative cost and efficiency of drip irrigation on fruit trees
9. Water management of oil crops

Farming Systems

1. An evaluation of the feasibility of various combinations of crops and animals on small farms.
2. Cropping systems for hill lands
3. Evaluation of species of annual crops for adaptability to uncultivated paddy soils
5. Coconut inter cropping
6. Cropping systems and nutrition.

THE PCARR NETWORK OF RESEARCH
CENTERS AND THEIR COMMODITY
ASSIGNMENTS

A. Multi-Commodity National Research Centers

<u>Center</u>	<u>National Responsibility For:</u>	<u>Regional Responsibility For:^{1/}</u>
<p>1. Central Luzon State University (CLSU), Munoz, Nueva Ecija</p>	<p>1. Fiber Crops (Cotton) 2. Carabeef (Ranch Operation) 3. Aquaculture (Fresh Water) 4. Beef/Chevon (Ranch Operation) 5. Forage, Pasture and Grasslands (Ranch Operation)</p>	<p>1. Fiber Crops (sericulture) 2. Plantation Crops (Industrial Oil) 3. Vegetable Crops 4. Dairy 5. Poultry 6. Farming Systems 7. Soil Resources 8. Inland Waters 9. Applied Rural Sociology 10. Macroeconomics 11. Water Resources</p>
<p>2. University of the Philippines at Los Banos (UPLB) Los Banos, Laguna</p>	<p>1. Rice 2. Plantation Crops (Industrial Oil) 3. Ornamental Horticulture 4. Carabeef (Small Farm Operation) 5. Dairy 6. Forage, Pasture & Grasslands 7. Farming Systems 8. Soil Resources 9. Water Resources 10. Macroeconomics</p>	<p>1. Corn & Sorghum 2. Fruit Crops 3. Plantation Crops (Cacao & Coffee) 4. Root Crops 5. Sugarcane 6. Farming Systems 7. Tobacco</p>

^{1/} It shall also have regional responsibility over all commodities on which it has national responsibility.

<u>Center</u>	<u>National Responsibility For:</u>	<u>Regional Responsibility For: ^{1/}</u>
	<ul style="list-style-type: none"> 11. Vegetable Crops 12. Legume 13. Pork 14. Poultry 15. Beef/Chevon (Small Farm Operation) 	
3. Visayas State - College of Agriculture (VISCA), Baybay, Leyte	<ul style="list-style-type: none"> 1. Root Crops 2. Fiber Crops (Abaca) 	<ul style="list-style-type: none"> 1. Coconut 2. Corn and Sorghum 3. Abaca 4. Vegetable Crops 5. Farming Systems 6. Soil Resources 7. Beef/Chevon 8. Forage, Pasture and Grasslands 9. Soil & Water Resources 10. Poultry 11. Applied Rural Sociology 12. Macroeconomics
4. University of Southern Mindanao (Formerly MIT) Kabacan, North Cotabato	<ul style="list-style-type: none"> 1. Corn & Sorghum 2. Plantation Crops <ul style="list-style-type: none"> a. Rubber b. Coffee c. Cacao 3. Fruit Crops 4. Fiber Crops <ul style="list-style-type: none"> a. Kenaf b. Jute c. Ramie 	<ul style="list-style-type: none"> 1. Legumes 2. Rice 3. Root Crops 4. Sugarcane 5. Applied Rural Sociology 6. Macroeconomics 7. Soil & Water Resources 8. Farming Systems
B. <u>Single-Commodity Research Centers</u>		
1. Forest Research Institute Los Baños, Laguna	Forest Production Commodities	Forest Production Commodities

1/ It shall also have regional responsibility over all commodities on which it has national responsibility.

<u>Center</u>	<u>National Responsibility For:</u>	<u>Regional Responsibility For:</u> ^{1/}
2. Philippine Sugar Commission La Granja, La Carlota City	Sugarcane	Sugarcane
3. Philippine Coconut Authority, Bago Oshiro, Davao	Coconut	Coconut
4. Philippine Tobacco Research and Training Center Batac, Ilocos Norte	Tobacco	Virginia, Cigar Filler

C. Regional Research Centers

<u>Center</u>	<u>Regional Responsibility For:</u>
1. Mariano Marcos State University (MMSU) Batac, Ilocos Norte	<ol style="list-style-type: none"> 1. Fiber Crops (Cotton and Sericulture) 2. Tobacco (Virginia, Burley and Turkish) 3. Legumes 4. Rice and Other Cereals 5. Vegetable Crops 6. Farming Systems 7. Soil Resources 8. Water Resources 9. Applied Rural Sociology 10. Macroeconomics 11. Marine Fisheries 12. Beef/Chevon (Backyard)
2. Cagayan Valley Institute of Technology (CVIT) Cabagan, Isabela	<ol style="list-style-type: none"> 1. Tobacco (Cigar Filler) 2. Beef/Chevon (Ranch-Type) 3. Carabeef (Ranch-Type) 4. Fiber Crops 5. Vegetable Crops 6. Forage, Pasture & Grasslands 7. Farming Systems 8. Macroeconomics 9. Legumes

<u>Center</u>	<u>Regional Responsibility For:</u>
3. Mountain State Agricultural College(MSAC), La Trinidad, Benguet	1. Fruit Crops 2. Ornamental Horticulture 3. Root Crops 4. Vegetable Crops 5. Farming Systems 6. Soil Resources 7. Macroeconomics 8. Applied Rural Sociology
4. Bicol Rice and Corn Experiment Station (BRCES)BPI, Pili, Camarines Sur	1. Corn and Sorghum 2. Rice and Other Cereals 3. Vegetable Crops 4. Farming Systems 5. Legumes
5. Palawan National Agricultural College(PNAC), Aborlan, Palawa	1. Coconut 2. Fruit Crops 3. Legumes 4. Root Crops 5. Vegetable Crops 6. Carabeef (Backyard) 7. Farming Systems 8. Soil Resources 9. Applied Rural Sociology 10. Macroeconomics 11. Beef/Chevon (backyard) 12. Swine 13. Poultry
6. La Granja Experiment Station, BPI, La Granja, La Carlota City	1. Legumes 2. Corn and Sorghum 3. Vegetable Crops 4. Farming Systems
7. Central Mindanao University (CMU), Misuan, Bukidnon	1. Forage, Pasture and Grasslands 2. Corn and Sorghum 3. Beef/Chevon (Ranch Type) 4. Dairy 5. Legumes 6. Plantation Crops(Cacao, Coffee and Rubber) 7. Rice and Other Cereals 8. Applied Rural Sociology 9. Macroeconomics

<u>Center</u>	<u>Regional Responsibility For:</u>
8. Davao Experiment Station, BPI, Bago Oshiro, Davao City	1. Fruit Crops 2. Fiber Crops(Abaca, Kenaf Ramie and Jute) 3. Plantation Crops(Cacao and Coffee) 4. Farming Systems 5. Ornamental Horticulture 6. Vegetable Crops 7. Legumes 8. Corn and Sorghum

The policy is that a research center is free to enter into any consortium agreement with other centers/stations for reasons of program coordination, common sharing of research facilities and services, and such others that will promote efficiency and maximum use of resources.

PCARR has recently approved for funding on farm-trial researches on crop commodities throughout the country which are broken as follows:

Corn - 15 provinces

Cagayan	(3 locations)
Isabela	(3 locations)
Quirino	(1 location)
Pangasinan	(1 location)
Camarines Sur	(1 location)
Albay	(2 locations)
Iloilo	(1 location)
Negro Occ.	(1 location)
Negros Or.	(1 location)
Bukidnon	(4 locations)
South Cotabato	(4 locations)
North Cotabato	(3 locations)
Sultan Kudarat	(2 locations)
Maguindanao	(3 locations)
Davao	(3 locations)

Sorghum - 27 provinces

Cavite
Pampanga
Bataan
Zambales
Mindoro Occ.
Laguna
Mindoro Or.
Palawan
Bulacan
Nuova Ecija
Nueva Vizcaya
Quirino
Isabela
Cagayan
Camarines Norte
Camarines Sur
Albay
Sorsogon
Iloilo
Bacolod
Cebu
Dumaguete
Bohol
Davao
Sultan Kudarat
Maguindanao
North Cotabato

Fiber Crops

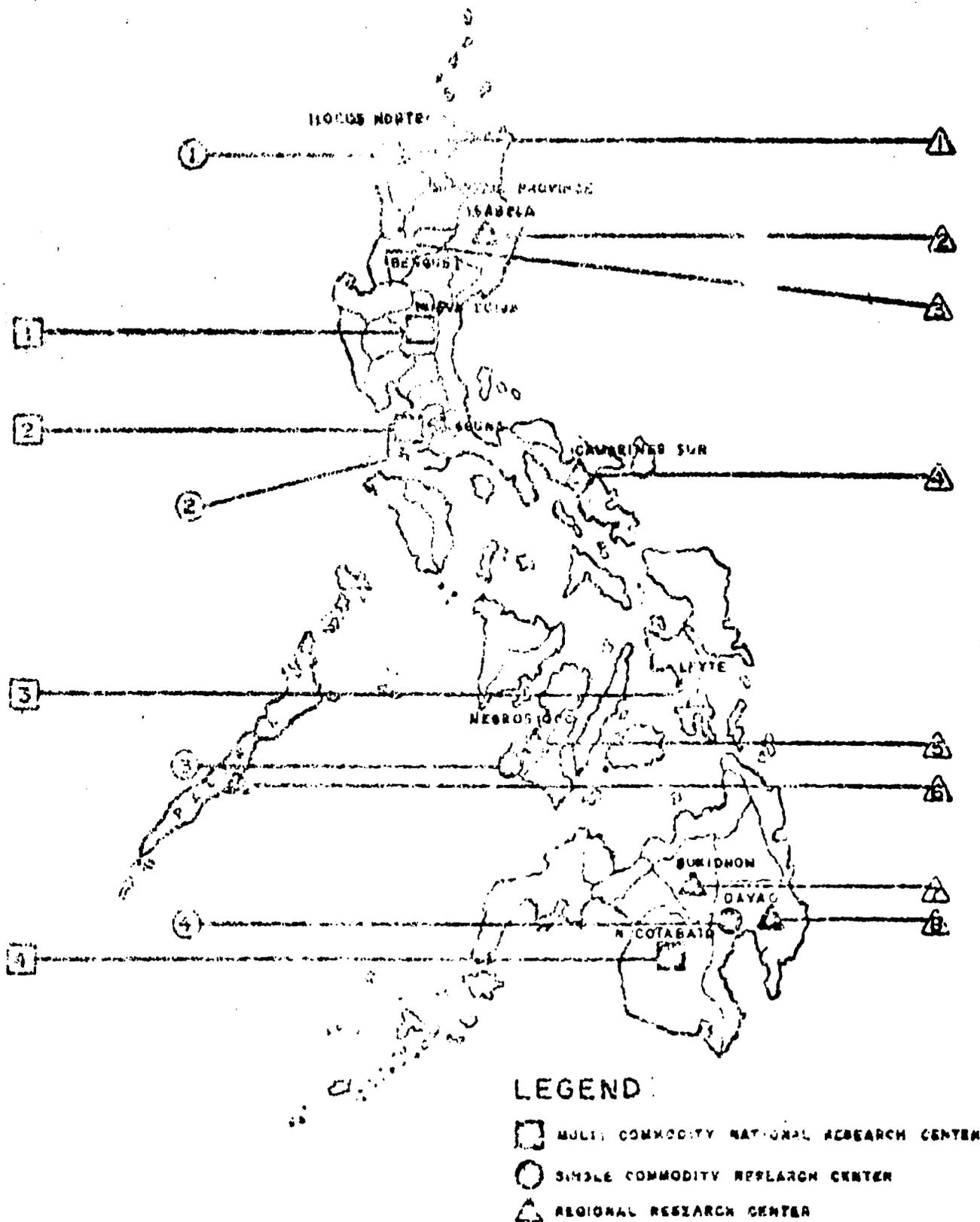
a. Abaca - 5 provinces

Oriental Mindoro
Albay
Camarines Sur
Leyte
Samar
Zamboanga

b. Cotton - 4 provinces

Pangasinan
Ilocos Sur
Isabela
La Union

PCARR NETWORK OF AGRICULTURE AND RESOURCES RESEARCH CENTERS AND STATIONS



COOPERATING STATIONS / AGENCIES - THERE ARE 130 THROUGHOUT THE COUNTRY SERVING AS TESTING SITES

Rootcrops

a. Sweet Potato - 13 provinces b. Cassava - 13 provinces

Pangasinan
Batanes
Tarlac
Cavite
Camarines Sur
Capiz
Negros Or.
Leyte
Zamboanga
Cagayan de Oro
South Cotabato
North Cotabato
Palawan

Pangasinan
Apayao
Tarlac
Batangas
Sorsogon
Negros Occ.
Bohol
Leyte
Zamboanga
Cagayan de
Oro
South
Cotabato
North
Cotabato
Palawan

c. White Potato - 3 provinces

Atock
Buguias

Vegetables - 14 provinces

Baguio
Ilocos Norte
Isabela
Nueva Ecija
Pangasinan
Camarines Sur
Negros Occ.
Cebu
Leyte
Zamboanga del Sur
Misamis Oriental
North Cotabato
Palawan
Davao City

Fruit Crops

<u>a. Citrus</u>	-	<u>4 provinces</u>	<u>b. Mango</u>	-	<u>2 provinces</u>
		Mindoro			Cebu
		Baguio			Iloilo
		Albay			
		Davao			

Legumes

<u>Legumes</u>	-	<u>29 provinces</u>	<u>Rice</u>	-	<u>8 provinces and</u> <u>21 others</u>
----------------	---	---------------------	-------------	---	--

Ilocos Norte	San Andres, Manila
Ilocos Sur	Ilocos Norte
Pangasinan	Nueva Ecija
Isabela	Iloilo
Quirino	Isabela
Cagayan	Camarines Sur
Nueva Ecija	Northern Leyte
Pampanga	North Cotabato
Bulacan	
Tarlac	
Mindoro Or.	
Mindoro Occ.	
Palawan	
Camarines Sur	
Albay	
Sorsogon	
Iloilo	
Negros Occ.	
Bohol	
Negros Or.	
Eulidnon	
Zamboanga del Sur	
South Cotabato	
Davao del Norte	
Davao Oriental	
Sultan Kudarat	
Maguindanao	
North Cotabato	
Lanao del Norte	

Objective of Farm Trials:

Farm productivity is affected by several factors and that the identification of the most important single factor is difficult. Under farmers' field condition agronomic interactions need to be evaluated. The main objective of field testing is to test in farmers' field the validity of available package of technology and to compare its economic advantages against those of the farmers' own production methods and practices.

Evaluation:

In implementing these farm trials, a complementary test is conducted in experiment station. The evaluation of results in such type of experiment is based on situation and location specificity. Results of these trials if found feasible for adaptation are the passed to the extension group to be piloted in a wider area or scope to backstop national or regional development projects. If there is anything wrong with the technology down the line, it is referred back to the researchers for further verification and refinement to suit specific and appropriate production method.

Office Memorandum • UNITED STATES GOVERNMENT

~~Mr. McCusker~~
TO Mr. Lane E. Holdcroft, AD/AD

DATE: Dec. 8, 1976

FROM Richard M. Dangler, AD/CD *RMA*

SUBJECT: IEE for Ag Research II

Attached is the approved Initial Environmental Examination for Agricultural Research II providing for a negative determination.

Attachment: a/s

Agricultural Research II - Philippines

I. Examination of Nature, Scope, and Magnitude of Environmental Impacts**Description of Projects**

The purpose of this project is to help the GOP improve the quality and quantity of agricultural production by improving research on farming processes and systems to benefit small farmers.

A network of 15 agricultural research centers has been established throughout the Philippines. The centers are located in areas having homogeneity of agricultural character so that the research in each particular area can be focused on a manageable span of activities.

These centers are inadequately staffed and lack research and living accommodations necessary to attract and hold competent staff to conduct research programs relevant to the area they serve. Each center requires infrastructure such as laboratories, utilities, storage, greenhouses and staff housing. The centers also need additional general and special equipment for both routine operations and specialized research.

At each center, besides the building and small utility network (i.e., water, drainage, electric and road system), there are field research areas which are used for experimental purposes. These areas may vary between 100 ha. and 2,500 ha. and are typical farm lands found in the region served by the research center. About 25 full time research staff, on an average, should be assigned to each center, and a complement of 50 to 150 local workers serve the centers and work in the experimental plots. Services to the research center are modest, supplies are received by truck or van, personnel movements for staff and visitors are limited, and the workers move easily to and from the centers to their homes in nearby small villages.

To bring the centers up to full operating efficiency, there is a serious requirement for more trained staff, new and better lab and operational equipment, and improvement of the infrastructure complex. The AID loan will make it possible to provide training for individuals who will become research staff members, to employ advisors, and to improve the facilities and equipment of the centers.

Five regional centers and the Economic Garden of the National Center at Los Banos have been selected to receive the benefits of this loan. The regional centers are located as follows: Ilocos, Cagayan Valley, Eastern Visayas, Palawan and Davao.

IRE

The general description fits each of the selected centers. Staff training-- academic and practical -- will take place at various established agricultural institutions in the Philippines, the U.S. and in International Centers. Improvements to the buildings will follow contemporary Philippine design and construction, and equipment will be supplied from U.S. sources. Advisors from the U.S. will help on program development and agricultural research.

The land areas utilized for experimental purposes will be subjected to continuous cultivation and growing processes. New crop introduction will be evaluated, and cultivation methods and farming systems will be studied to achieve optimum production compatible with the environment. Important aspects of the research will be vertebrate and nonvertebrate pest control, disease control and soil and water management.

Identification and Evaluation of Environmental Impacts

In conjunction with the Project Description, the Impact Identification and Evaluation Form has been completed and is attached. The following are summary observations:

1. The assistance to be extended will take place within existing land areas, facilities, and ongoing operations.
2. The research centers are of such small scale and the nature of their operations is such that there can be no significant adverse impact on the environment.
3. A beneficial environmental impact could result from the centers' research in agriculture. The research should improve land and water use, provide more adequate pest control measures, and enhance quality of life for the farmer by improving the quantity and quality of his product and therefore his income.
4. Some principles of environmental protection will be an inherent part of the research and farm management programs undertaken by the research stations. These principles will be introduced by the influence of the AID-supported training candidates, who will normally be exposed to environmental considerations in their advanced training.
5. The research centers will have a beneficial impact on the rural populations adjacent to them by stimulating exchange of ideas between the people of the area and the research center staff.

II. Recommendation for Environmental Action

AID assistance to the improvement of the agricultural centers -- in training, improving facilities, and subsequent research programs -- will have no significant adverse impact on the environment in which the centers are located, or elsewhere. Ultimate beneficial environmental impacts can be expected as a result of the research center programs.

In view of the character of this project and as a result of an examination and evaluation of potential environmental impacts, it is felt that this proposed action is not one which will have a significant effect on the human environment and is, therefore, an action for which an Environmental Assessment or an Environmental Impact Statement will not be required. It is recommended that a Negative Determination be approved for Agricultural Research II, Philippines, FY 78.

Attachment:
Impact Identification and Evaluation Form

Impact Areas : Sub-areas 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 ----- | L |
| d. Changing soil character ----- | L |
| e. Eliminating ecosystems ----- | L |
| 2. Altering natural defenses ----- | N |
| 3. Foreclosing important uses ----- | N |
| 4. Jeopardizing man or his works ----- | N |
| 5. Other Factors | |
| ----- | ----- |
| ----- | ----- |

B. WATER QUALITY

- | | |
|---|-------|
| 1. Physical state of water ----- | H |
| 2. Chemical and biological states ----- | L |
| 3. Ecological balance ----- | L |
| 4. Other Factors | |
| ----- | ----- |
| ----- | ----- |

1/ See Explanatory Notes for this Form.

2/ See the following symbols: H - High environmental impact
 L - Little environmental impact
 M - Medium environmental impact
 H - High environmental impact
 U - Unknown environmental impact

August 1976

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 | |
| _____ | _____ |
| _____ | _____ |

E. CULTURAL

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

F. SOCIOECONOMIC

- | | |
|--|-------|
| 1. Changes in economic/employment patterns ----- | L |
| 2. Changes in population ----- | N |
| 3. Changes in cultural patterns ----- | N |
| 4. Other factors | |
| <u>Secondary economic effect on region</u> | H |
| _____ | _____ |
| _____ | _____ |

G. HEALTH

- | | |
|---|----------------------------|
| 1. Changing a natural environment ----- | N |
| 2. Eliminating an ecosystem element ----- | See LAND USE,
item 1.c. |
| 3. Other factors | |
| <u>Emergency health centers</u> | M |
| _____ | _____ |
| _____ | _____ |

H. GENERAL

- | | |
|---------------------------------|-------|
| 1. International impacts ----- | N |
| 2. Controversial impacts ----- | N |
| 3. Larger program impacts ----- | N |
| 4. Other factors | |
| _____ | _____ |
| _____ | _____ |

I. OTHER POSSIBLE IMPACTS (not listed above)

_____	_____
_____	_____
_____	_____

See attached Discussion of Impacts.

Philippines
Agricultural Research II
FY 77

Discussion of Impacts

LAND USE

There are no significant changes to land forms or character of the land. Land clearing is not contemplated as the experimental areas are already established. The only additional ground desired would be in the neighborhood of a few hundred acres at most. Only very minor ecosystems might be affected; i.e., analogous to those small ecosystems that might exist on an average U.S. farm.

The soil in the experimental area will be subjected to various tests for reaction to cultivation processes, water application, and different fertilizers. This is to be done on a controlled basis and at a scale that would have little environmental impact.

WATER QUALITY

The use of water in a balanced way will be one of the subjects to be addressed by each center. There should be no process of water use or change of quality that might be considered adverse to environmental quality.

There may be a small amount of chemicals precipitated on adjacent properties and in neighboring streams. However, the amounts and types of chemicals would not be in quantity sufficient to have a significant effect.

Disturbance of feeding and nesting areas for a very small number of birds and small animals might be expected. There will be no significant effect on stream courses or character of water in streams associated with the experimental areas.

SOCIOECONOMIC

Some additional jobs will be created at each center because of improvements and increased activities. Those people in the community who are associated with the center will probably receive some benefits by the associations; i.e., by talking with scientists, borrowing books, observing lab techniques. Young people may be stimulated to enter the field of scientific agriculture or to get a better education.

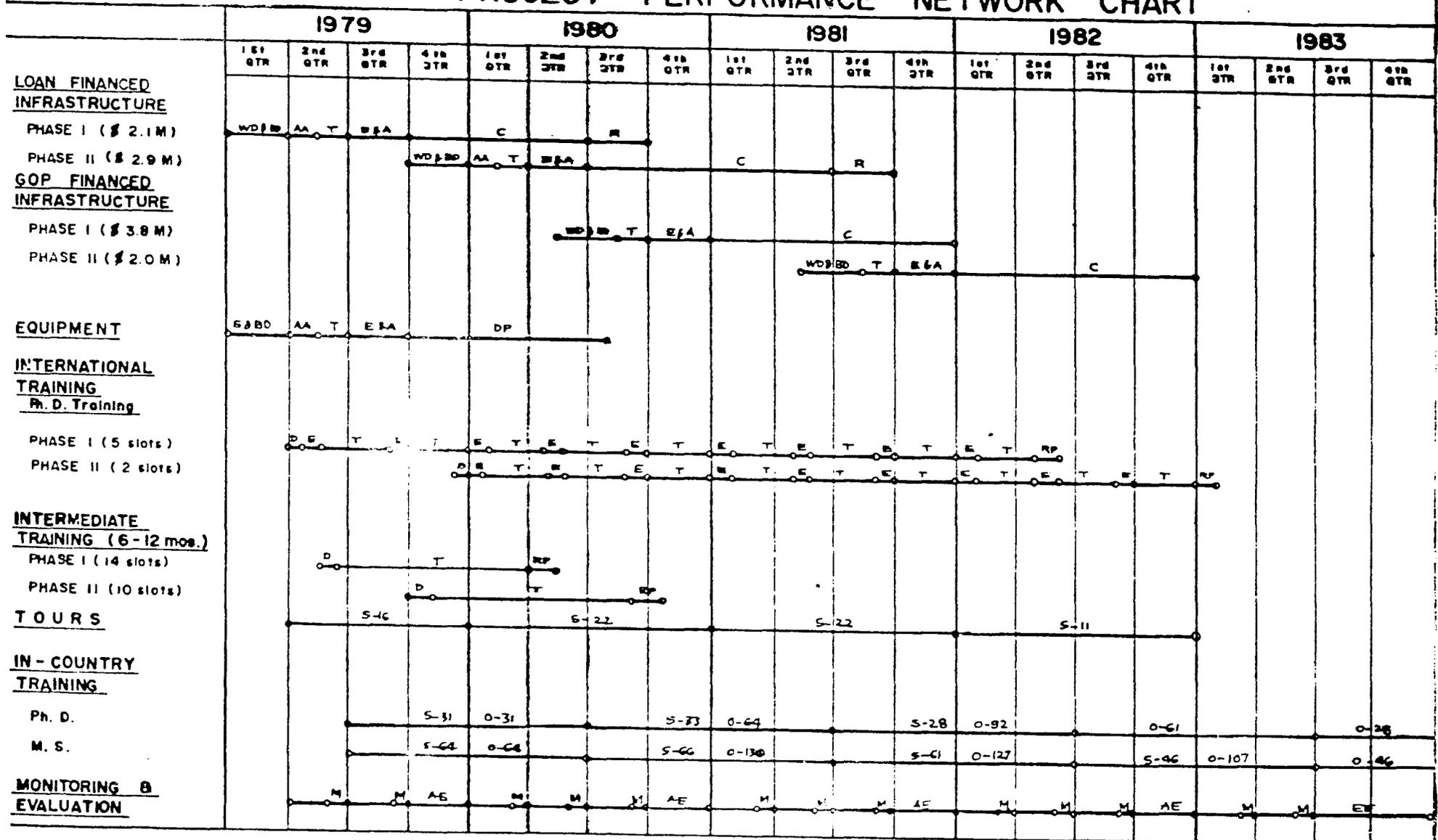
Discussion of Impacts

The real socioeconomic effects will be secondary; that is, resulting from application of research findings. Agricultural improvements developed at the centers will undoubtedly affect the lives of farmers in the region served by the centers. More suitable crops--i.e., hardy, pest resistant, greater in variety -- will mean production of a better product for a more certain market, with greater economic benefit.

HEALTH

In some areas the research centers may be the only places where adequate space may be made available to set up clinics in the case of floods, earthquakes, or epidemics.

AGRICULTURAL RESEARCH LOAN II PROJECT PERFORMANCE NETWORK CHART



LEGEND :

WD & BD - PREPARATION OF WORKING DRAWINGS & BID DOCUMENTS
 AA - AID'S APPROVAL
 T - TENDER PERIOD
 E & A - EVALUATION & AWARD
 C - CONSTRUCTION PERIOD
 R - REIMBURSEMENT

S & BD - PREPARATION OF EQUIPMENT SPECS & BID DOCUMENTS
 DP - DELIVERY PERIOD
 D - DEPARTURE
 E - ENROLMENT
 T - TRAINING PERIOD

RP - RETURN PERIOD
 S - NO. OF SLOTS
 O - NO. OF ON-GOING
 M - QUARTERLY MONITORING
 AE - ANNUAL EVALUATION
 EE - EVALUATION EX-POST

Evaluation Plan for
the Agricultural Research Loan II Project

I. Introduction

The Agricultural Research Loan II Project is a follow-up of the first loan to provide additional A.I.D. support for developing the Philippines capability for research in agriculture and natural resources. In general, it is aimed at accelerating the generation of new technology applicable to the problems of the small farmers.

A major thrust of the loan is to improve the research capability of eight research centers to develop improved farming systems relevant to problems of small farmers within the respective target areas. A secondary objective is to strengthen PCARR's leadership role in the administration and management of agricultural research resources.

Achievement of these objectives requires the following inputs:
(1) technical support from both international and in-country research consultants; (2) manpower training in foreign and local institutions; (3) field and laboratory equipment; and, (4) infrastructure.

The projected output is a strengthened Philippine Agricultural research capability based on: (1) improved and expanded research infrastructure facilities, (2) adequate number of trained research personnel, (3) increased equipment to carry out research activities, and (4) improved flow and exchange of research information.

II. The Evaluation Plan

It is on the basis of these objectives, inputs, and outputs that the evaluation is planned. The evaluation plan shall consist of (1) identification of baseline activities and resources; (2) periodic monitoring of the progress of the project; and, (3) on-going evaluation and evaluation at the end of the project or ex-post evaluation.

A. Purposes of the Evaluation Plan

1. Assessment of progress toward the attainment of planned project objectives and confirmation that targeted outputs are being achieved within the planned time frame;
2. Identification and analysis of problem areas or constraints which may inhibit attainment of project objectives;
3. Assessment of corrective action needed to help overcome such constraints;

4. Assessment of the general social and economic impact of the project on intended beneficiaries; and,
5. Provide decision makers with information and analyses useful for future project and policy planning.

B. Identification of Baseline Activities and Resources

Eight research centers will be developed under the project. These are:

1. Central Luzon State University (CLSU)
2. University of the Philippines at Los Baños (UPLB)
3. Visayas State College of Agriculture (VISCA)
4. University of Southern Mindanao (USM)
5. Forest Research Institute (FORI)
6. Mariano Marcos State University (MISU)
7. Cagayan Valley Institute of Technology (CVIT)
8. Palawan National Agricultural College (PNAC)

To provide benchmark information, the following data will have to be obtained for each of the eight institutions:

1. Research manpower

- Directory and analysis of manpower resources by degree (i.e. B.S., M.S., Ph.D.), field of specialization, research experience including areas of research previously and presently being done, percentage of time devoted to research and other activities.
- Training activities
- Salary rates and incentives
- Performance evaluation
- For FORI analysis should include places of assignment

2. Infrastructure

- Land development and utilities -- experiment stations, irrigation, weather measurement facilities, etc.
- Laboratory buildings
- Library facilities -- books, journals, materials, etc.
- Staff Housing

3. Equipment

- Field equipment -- farm machineries, vehicles, etc.
- Laboratory equipment
- Computer facilities
- Calculators

These would include number and values by type of equipment, present conditions for utilization, rate of utilization for research and other uses, maintenance facilities and costs, training of operators, etc.

4. Technical support

- Availability of consultants in various fields

5. Research activities

- List of researches completed, both published and unpublished
- List of on-going projects
- Distribution of research results
- Trends in availability and utilization of research funds during the past ten years

6. Farming systems

- Distribution of farms by crop and size
- Land utilization within the region
- Land utilization within farms
- Production and value of output per farm, per province, per region
- Cost of production
- Income per farm
- Institutional arrangements, e.g. between landlord and tenant, between farmers and workers
- Input utilization

7. Evaluation of present technology

- Identify what technology has been generated for each commodity within the center
- Extent to which technology generated outside the center had been verified in other research stations and in farmers' field within the respective areas of responsibility, and if applicable, even outside the areas of responsibility
- Extent to which technology generated outside the center had been verified within the center, other research stations, and in farmers fields within the respective areas of responsibility
- Awareness of farmers of present technology
- Analysis of present technology adopted by farmers in the area
- Yields per farm and per hectare for various crops and technology

8. Extension systems

- Sources of information of extension workers
- Number and organization of extension workers
- Assessment of information needs of farmers vis-a-vis information disseminated to them

9. Markets and prices

- Disposal of output, e.g. home consumption, marketed, landlords' share, etc.
- Market outlets
- Marketing arrangements
- Prices of inputs and outputs
- Level of Sufficiency
- Exports and imports (outside region)

10. Research priorities and on-going projects

For the benchmark information at the start of the project most of these data will be obtained from records of the eight agencies and available research reports. Where data are not available, a survey will be conducted.

C. Periodic Monitoring of the Progress of the Project

Research manpower, infrastructure, equipment, technical support, and research activities will be monitored on a continuing basis during the project period. Progress will be compared based on the benchmark information or previous year's information and then with the project plan. Deviations from the plan will have to be explained.

Monitoring is the continuous gathering of information on project inputs, outputs and objectives, and on conditions and complementary activities that are critical to the success of the project. It utilizes benchmark information collected during the design/preparation phase, serving to alert project management and policy-makers to implementation problems requiring corrective action, and may provide the necessary information for the instigation and preparation of ongoing evaluation.

The major function of monitoring is the control of sound progress of implementation. To be effective, monitoring must provide quick feedback to project management.

Monitoring relies partially on the information produced by the internal project reports and often requires the generation of additional project-related information.

Although monitoring and reporting overlap extensively, monitoring involves more than the recording of actual inputs, activities, and outputs. Comparisons between actual and planned estimates need to be analyzed, implementation problems diagnosed and additional information gathered in order to ameliorate implementation problems. Early warning and the recommendation of corrective actions to be taken by project management are crucial for effective monitoring.

D. Ongoing and Ex-post Evaluation

Ongoing projects will be evaluated every year to see whether relevant research projects are being conducted.

The evaluation of farming systems, technology generation, verification, and dissemination will be done at the beginning and end of the project and changes in the various elements will be analyzed.

Ongoing and ex-post evaluation is the analysis of project results in order to assess the extent to which the objectives (goals and purposes) of a project have been realized. For this assessment, information on project outputs and project effects/impact need to be collected and analyzed.

Ongoing evaluation is the continual analysis during project implementation of project outputs, effects, and developmental impact for the purpose of providing project management and policy-makers with any analytical support that might be necessary to enable them to assess, and if required, adjust policies, objectives, institutional arrangements and resources.

Ex-post evaluation is an analysis after completion of a project (or of a distinct phase of it) of its effects and impact, which may draw on information provided by monitoring and ongoing evaluation, though supplementary special studies may sometimes be needed. The purpose of ex-post evaluation is to provide policy-makers information and analysis for future planning and/or to inform donors and the general public on project results.

Ongoing evaluation and ex-post evaluation rely upon the other tools of information, i.e. accounting, auditing, reporting and monitoring. However, evaluation requires additional information, especially non-project related information. Furthermore, information required for evaluation should cover the entire project and all project components, however, it may focus only on critical implementation issues.

The other information tools used in the collection and analysis of project inputs and results to assess the extent to which the objectives and goals of this project are realized are accounting, auditing, and reporting.

E. Accounting, Auditing, and Reporting

1. Accounting is part of the broader management system required for project implementation. The function of accounting is to maintain in conformity with accepted standards financial records including balance sheets and sometimes profit and loss statements.
2. Auditing is the periodic review and verification of accounts by qualified, objectives, officially designated accounting specialists.
3. Reporting is the continuous information flow on fiscal and physical progress of project implementation. Internal reporting is the information flow from the lower echelons to project management. External reporting is the information flow from project management to executive agencies. A project reporting system should produce information on inputs, activities, and outputs. Reporting should be comprehensive. Most of the information produce for reporting will be quantitative. However, reports often should show some qualitative analysis.

III. M/E Evaluation Organization and Staffing

A. Joint M/E Evaluation Committee

An Evaluation Committee consisting of the following representatives will be established:

1. Deputy Director General, PCARR, Co-Chairman
2. Assistant Director for Agricultural Development, USAID, Co-Chairman
3. Director of Socio-Economic Research, PCARR, Member
4. Director of Crop Research, PCARR, Member
5. Project Manager, USAID, Member
6. Agricultural Program Evaluation Officer, USAID, Member
7. Representative of NEDA, Member

Frequency of Reviews/Evaluations

The Evaluation Committee will meet semestrally at a location mutually agreed upon by the two Co-Chairman to approve M/E activity plans and review progress and address each of the above five purposes. In depth evaluations will be conducted annually in accordance with standard AID Evaluation Guidelines, until the project terminates. If the committee so determines, outside consultants may be recruited to assist in completing selected aspects of the annual evaluation as well as specific M/E activities. Committee members will report the Committee's findings to their respective superiors.

B. M/E Staffing

One qualified staff member of the PCARR will be designated as responsible for implementing the M/E Program Plan and to maintain the M/E system under the direct supervision of the PCARR Deputy Director General for Station Development. The designated staff member will directly undertake the monitoring aspect, but will rely upon the services of other qualified professionals in PCARR and other Philippine institutions and/or contract personnel to undertake special studies which the Evaluation Committee deems and desirable. The costs associated with maintaining the M/E system should be modest and will be the responsibility of the implementing agencies. Loan funds may be used for supporting the cost of short term international consultants and USAID will endeavor to assist in providing the services of AID consultants for special evaluation activities.

IV. Impact Monitoring and Evaluation

A. Impact Objectives

The project aims to increase farm productivity through the generation of appropriate technology needed by the small farmers. While ultimately the principal beneficiaries of the project will be consumers, the principal initial beneficiaries will be small farmers engaged in producing basic priority food and feed crops.

B. Key Indicators

The project's goal is stated in terms of increased productivity and income of small farmers. The key indicators will be: (1) surveys and monitoring reports on farm yields and income, (2) National Grains Authority records on crop production of the Bureaus of Agricultural Economics and Agricultural Extension, and other agencies in the field, (3) farmer interviews, and (4) records of farmers' cooperatives/organizations whenever available.

For the purpose of ascertaining the impact of the project on improved levels of living, it is necessary to measure changes in (1) income, (2) output, (3) expenditures, (4) employment and (5) consumption. The evaluation committee will endeavor to ensure that these indicators are assessed to the extent possible.

C. Methodology

Most of the information necessary to assess the impact of the project relative to farm productivity is embodied in the monitoring reports and surveys. Measuring the impact on improved levels of living will require expertise in undertaking economic and sociological studies in the field. However, since similar studies are

of interest and relevance to other GRP development efforts, the Evaluation Committee will collaborate with other studies pertinent to the project. Short term international consultants could be funded under the project for conducting such studies.

The principal types of research studies needed are: (1) baseline data collection and processing and, (2) continuing studies to measure progress in terms of selected indicators. It is necessary to conduct the baseline studies in the early stages of this project but it is not expected that significant changes will be observed by year five.

V. Output Monitoring and Evaluation

A. Methodology

The monitoring aspect of this M/E program is directed primarily at strengthening project management by monitoring project inputs, outputs, and objectives by project thrusts. Its success is dependent upon the efforts of those involved in each component of the project fully contributing needed information, accurately and on a timely basis to the responsible M/E Officer. Techniques to be used may include MIS, PERT, or CPM.

B. Inputs and Outputs

The following are the inputs and outputs to be monitored.

1. Manpower Development

Objective: To train an adequate number of researchers to:
(a) design, conduct, and analyze research on crops, livestock, forestry, fisheries, soil and water, socio-economics, etc.,
(b) to develop and maintain a reliable project monitoring system and, (c) to develop an outreach program which will provide quick response to farmers' needs.

Inputs: The manpower training component will provide assistance for training 237 staff at the M.S. level and 92 staff at the Ph.D. level. In addition, 85 staff for five years will be provided an opportunity to participate in international seminars/workshops and/or short term observational tours and 44 short term refresher and post-doctoral training in activities directly supportive of the research program thrusts.

Outputs: The outputs will be a core staff of fully qualified research personnel trained and in-place, in the eight research centers and other stations of the research system. The core staff will be adequate to develop viable long and short-term research projects/programs highly relevant to the needs of the farmers.

COUNTRY CHECKLIST

A. GENERAL CRITERIA FOR COUNTRY

1. FAA Sec. 116. Can it be demonstrated that contemplated assistance will directly benefit the needy? If not, has the Department of State determined that this government has engaged in consistent pattern of gross violations of internationally recognized human rights? Yes.

2. FAA Sec. 481. Has it been determined that the government of recipient country has failed to take adequate steps to prevent narcotics drugs and other controlled substances (as defined by the Comprehensive Drug Abuse Prevention and Control Act of 1970) produced or processed, in whole or in part, in such country, or transported through such country, from being sold illegally within the jurisdiction of such country to U.S. government personnel or their dependents, or from entering the U.S. unlawfully? No. GOP cooperates with U.S. in combating drug abuse.

3. FAA Sec. 620 (a). Does recipient country furnish assistance to Cuba or fail to take appropriate steps to prevent ships or aircraft under its flag from carrying cargoes to or from Cuba? No.

4. FAA Sec. 620 (b). If assistance is to a government, has the Secretary of State determined that it is not controlled by the international Communist movement? Yes.

5. 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) debt is not denied or contested by such government? No.

6. 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? No.
7. FAA Sec. 620 (f); App. Sec. 108. Is recipient country a Communist Country? Will assistance be provided to the Democratic Republic of Vietnam (North Vietnam), South Vietnam, Cambodia or Laos? No to both questions.
8. FAA Sec. 620 (i). Is recipient country in any way involved in (a) subversion of, or military aggression against, the United States or any country receiving U.S. assistance, or (b) the planning of such subversion or aggression? No.
9. 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? No.
10. FAA Sec. 620 (l). If the country has failed to institute the investment guaranty program for the specific risks of expropriation, inconvertibility or confiscation, has the AID Administrator within the past year considered denying assistance to such government for this reason? NA
11. FAA Sec. 620 (o); Fishermen's Protective Act, Sec. 5. If country has seized, or imposed any penalty or sanction against, any U.S. fishing activities in international waters. NA
- a. has any deduction required by Fishermen's Protective Act been made?
- b. has complete denial of assistance been considered by AID Administrator?

12. FAA Sec. 620 (q); App. Sec. 504. (a) Is the government of the recipient country in default on interest or principal of any AID loan to the country? (b) Is country in default exceeding one year on interest or principal on U.S. loan under program for which App. Act appropriates funds, unless debt was earlier disputed, or appropriate steps taken to cure default? (a) No. (b) No.
13. FAA Sec. 620 (s). What percentage of country budget is for military expenditures? How much of foreign exchange resources spent on military equipment? How much spent for the purchase of sophisticated weapons systems? Less than 16% of the national budget goes into defense. The amount of foreign exchange spent on military equipment is negligible. To the best of our knowledge no funds have been spent on sophisticated weapons.
14. 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? No.
15. FAA Sec. 620 (a). 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 AID Administrator in determining the current AID Operational Year Budget? The country is not in arrears vis-a-vis its U.N. dues and assessments.
16. FAA Sec. 620A. Has the country granted sanctuary from prosecution to any individual or group which has committed an act of international terrorism? No.
17. FAA Sec. 666. Does the country object on basis of race, religion, national origin or sex, to the presence of any officer or employee of the U.S. there to carry out economic development program under FAA. No.
18. FAA Sec. 669. Has the country delivered or received nuclear reprocessing or enrichment equipment, materials or technology, without specified arrangements on safeguards, etc.? No.
19. FAA Sec. 901. Has the country denied its citizens the right or opportunity to emigrate? No.

B. FUNDING CRITERIA FOR COUNTRY

1. Development Assistance Country Criteria

- a. FAA Sec. 102(c), (d). Have criteria been established, and taken into account, to assess commitment and progress of country in effectively involving the poor in development, on such indexes as: (1) small-farm labor intensive agriculture, (2) reduced infant mortality, (3) population growth, (4) equality of income distribution, and (5) unemployment.
- Yes, criteria have been established and were refined in FY 78 under an AID financed project entitled "Economic and Social Impact Analysis/Women in Development".
- b. FAA Sec. 201 (b)(6), (7) & (8); Sec. 208; 211 (a) (4), (7). Describe extent to which country is:
- (1) Making appropriate efforts to increase food production and improve means for food storage and distribution.
- The GOP's Five-Year Development Plan (78-82) emphasizes increased food production is a priority goal.
- (2) Creating a favorable climate for foreign and domestic private enterprise and investment.
- The GOP maintains a favorable climate for both foreign and domestic investment.
- (3) Increasing the public's role in the developmental process.
- The GOP has embarked upon a land reform program to transfer ownership of land to small farmers. Also, through local governments, the GOP is trying to encourage increased local participation in planning and development.
- (4) (a) Allocating available budgetary resources to development.
- About 64% of the national budget is allocated for economic and social development.
- (b) Diverting such resources for unnecessary military expenditures and intervention in affairs of other free and independent nations.
- Less than 16% of national budget is spent on defense.
- (5) Making economic, social, and political reforms such as tax collection improvements and changes in land tenure arrangements, and
- The Philippines has traditionally espoused the basic principles of a free and open society. On Sept. 22,

making progress toward respect for the rule of law, freedom of expression and of the press, and recognizing the importance of individual freedom, initiative, and private enterprise.

1972, Pres. Marcos, citing a serious threat from both the extreme left and right, invoked martial law. Ruling by decree, he ordered accelerated implementation of needed reforms designed to reduce widespread crime and corruption and to speed development efforts aimed especially at the lower income groups. In this regard, he strongly encouraged the rural electrification program and inaugurated a national land reform program. Efforts were also aimed at strengthening local and provincial government units and increasing government revenues through tax reform and improved tax administration. However, under martial law, press publications, certain organizations and activities (e.g., those involving labor or students) are closely scrutinized. The recently formed Parliament may take action to lessen some of the current controls.

- (6) Otherwise responding to the vital economic, political, and social concerns of its people, and demonstrating a clear determination to take effective self-help measures.

Over the past eight years, the Philippine Government has placed increasing emphasis on rural development in an effort to narrow the gap between the rich and the poor, to increase employment opportunities, raise the income levels of the rural population and to improve the level of living. Heavy investments are being made in rural electrification, transportation, irrigation, agrarian reform, farmer support services, agriculture production, nutrition, and education. Greatly increased

external assistance from various bilateral and international donors over the past five years has been directed almost entirely to the rural sector.

c. FAA Sec. 201 (b), 211(a). Is the country among the 20 countries in which development assistance loans may be made in this fiscal year, or among the 40 in which development assistance grants (other than for self-help projects) may be made? Yes.

d. FAA Sec. 115. Will the country be furnished, in same fiscal year, either security supporting assistance, or Middle East peace funds? If so, is assistance for population programs, humanitarian aid through international organizations, or regional programs? No.

2. Security Supporting Assistance Country Criteria

a. FAA Sec. 502B. Has the country engaged in a consistent pattern of gross violations of internationally recognized human rights? Is program in accordance with policy of this Section? NA

b. FAA Sec. 531. Is the Assistance to be furnished, to a friendly country, organization, or body eligible to receive assistance? NA

c. 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? NA

COUNTRY CHECKLIST

A. Procurement

1. FAA Sec. 602. Are there arrangements to permit U.S. small business to participate equitably in the furnishings of goods and services financed? **Small business notification procedures will be followed.**
2. FAA Sec. 604(a). Will all commodity procurement financed be from the U.S. except as otherwise determined by the President or under delegation from him? **Commodity procurement will be the U.S. and Code 941 Countries with minor exceptions of commodities not available from those sources.**
3. FAA Sec. 604(d). If the cooperating country discriminates against U.S. marine insurance companies, will agreement require that marine insurance be placed in the U.S. on commodities financed? **Yes**
4. FAA Sec. 604(e). 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? **N/A**
5. FAA Sec. 608(a). Will U.S. Government excess personal property be utilized whenever practicable in lieu of the procurement of new items? **Yes**
6. MMA Sec. 901(b). (a) Compliance with requirement 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 private) owned U.S.-flag commercial vessels to the extent that such vessels are available at fair and reasonable rates. **The loan agreement will contain a provision for such compliance.**
7. FAA Sec. 621. If technical assistance is financed, will such assistance be furnished to the fullest extent practicable as goods and professional and other services from private enterprise on a contract basis? If the facilities of other Federal agencies will be utilized, **Technical Assistance will be procured following standard AID procedures. AID will approve all technical assistance contracts.**

are they particularly suitable, not competitive with private enterprise, and made available without undue interference with domestic programs?

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

If air transportation of persons or property is financed on grant basis, will provision be made that U.S.-flag carriers will be utilized to the extent such service is available?

N/A

B. Construction

1. FAA Sec. 601(d). If a capital (e.g., construction) project, are engineering and professional services of U.S. firms and their affiliates to be used to the maximum extent consistent with the national interest?

Not appropriate for the construction to be undertaken

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?

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.

N/A

C. Other Restrictions

1. FAA Sec. 201(d). If development loan, is interest rate at least 2% per annum during grace period and at least 3% per annum thereafter?

Yes

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?

N/A

3. FAA Sec. 620(h). Do arrangements preclude promoting or assisting the foreign aid projects or activities of Communist-Bloc countries, contrary to the best interests of the U.S.?

Yes

4. FAA Sec. 636(i). Is financing not permitted to be used, without waiver, for purchase, long-term lease, or exchange of motor vehicle manufactured outside the U.S. or guaranty of such transaction? Yes
5. Will arrangements preclude use of financing:
- a. FAA Sec. 114. to pay for performance of abortions or to motivate or coerce persons to practice abortions, to pay for performance of involuntary sterilization, or to coerce or provide financial incentive to any person to practice sterilization? Yes
- b. FAA Sec. 620(g). to compensate owners for expropriated nationalized property? Yes
- c. FAA Sec. 660. to finance police training or other law enforcement assistance, except for narcotics programs? Yes
- d. FAA Sec. 662. to pay pensions, etc. for military personnel? Yes
- f. App. Sec. 105. to pay U.N. assessments? Yes
- g. App. Sec. 106. to carry out provisions of FAA Sections 209(d) and 251(h)? (transfer to multilateral organization for lending). Yes
- h. App. Sec. 112. to finance the export of nuclear equipment, fuel, or technology or to train foreign nationals in nuclear fields? Yes
- i. App. Sec. 501. to be used for publicity or propaganda purposes within U.S. not authorized by Congress? Yes

COUNTRY CHECKLISTA. GENERAL CRITERIA FOR PROJECT

1. App. Unnumbered; FAA Sec. 653(b); Sec. 671 (a) Describe how Committees on Appropriations 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 over that figure.
 - (a) The committees will be notified by letter at least 15 days prior to obligation of this loan as is standard AID practice.
 - (b) No
2. FAA Sec. 611(a)(1). Prior to obligation in excess of \$100,000, will there be (a) engineering, financial, and other plans necessary to carry out the assistance and (b) a reasonably firm estimate of the cost to the U.S. of the assistance?
 - (a), (b) Yes. See Project Paper
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?

All legislative authorities exist.
4. FAA Sec. 611(b); App. Sec. 101. If for water or water-related land resource construction, has project met the standards and criteria set per the Principles and Standards for Planning Water and Related Land Resources dated October 25, 1973?

N/A
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 the country's capability effectively to maintain and utilize the project?

Yes
6. FAA Sec. 209, 619. Is project susceptible of execution as part of regional or multi-lateral project? If so, why is project not so executed? Information and conclusion

This project is not appropriate for execution as a regional project although it will contribute

whether assistance will encourage regional development programs. If assistance is for newly independent country, is it furnished through multi-lateral organizations or plans to the maximum extent appropriate?

to regional development by serving as an example for development of other national research systems. The project is marginal in magnitude to qualify for multilateral funding.

7. FAA Sec. 601(a); (and Sec. 201(f) for development loans). 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; (c) encourage development and use of cooperatives, 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.
- (a) The project will play a major role in generating new technology and improving technical efficiency of agriculture production
a,b,c,d,f. N/A
8. FAA Sec. 601(b). Information and conclusion 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).
- Private enterprise is being utilized to the maximum extent practicable under this loan. U.S. suppliers benefit.
9. FAA Sec. 612(b); Sec. 636(h). 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 to meet the cost of contractual and other services.
- The GRP will provide local currencies for the major part of this project. The Philippines is not an excess currency country.
10. FAA Sec. 612(d). Does the U.S. own excess foreign currency and, if so, what arrangements have been made for its release?
- No
11. ISA 14. Are any FAA funds for FY 78 being used in this Project to construct,
- No

operate, maintain, or supply fuel for, any nuclear powerplant under an agreement for cooperation between the United States and any other country?

B. FUNDING CRITERIA FOR PROJECT

1. Development Assistance Project Criteria

a. FAA Sec. 102(c); Sec. 111; Sec. 281a. Extent to which activity will (a) effectively involve the poor in development, by extending access to economy at local level, increasing labor-intensive production, spreading investment out from cities to small towns and rural areas; and (b) help develop cooperatives, especially by technical assistance, to assist rural and urban poor to help themselves toward better life, and otherwise encourage democratic private and local governmental institutions?

The project will involve and benefit the rural poor by developing, verifying and disseminating better farming practices and systems for increased rural productivity. The research priorities are aimed predominantly at small farmers by focusing on crops grown by small farmers.

b. FAA Sec. 103, 103A. Is assistance being made available: (include only applicable paragraph--e.g. a, b, etc.--which corresponds to source of funds used. If more than one fund source is used for project, include relevant paragraph for each fund source).

(103A) The loan is to assist in improving and expanding the indigenous research capacity of the Philippines. The design recognizes that new and improved technology is the single most important factors in increasing agricultural productivity. The designers were also aware that gains in productivity from research have been shown to be approximately attributable as follows:

(1) (103) for agriculture, rural development or nutrition; if so, extent to which activity is specifically designed to increase productivity and income of rural poor; (103A) if for agricultural research, is full account taken of needs of small farmers.

Indigenous, 45 percent;
transfer from other similar national systems, 35 percent;
transfer from international centers, 25 percent.

The needs of small farmers have been consistently considered.

c. FAA Sec. 110(a); Sec. 208(e). Is the recipient country willing to contribute funds to the project, and in what manner has or will it provide assurances that it will provide at least 25% of the costs of the program, project, or activity with respect to which the assistance is to be furnished (or has the latter cost-sharing requirement been waived for a "relatively least-developed" country)?

The loan agreement and the planned administrative arrangements ensure that the GRP provides more than 3.5 times more funds than the loan during the life of the project.

d. 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"?

N/A

e. FAA Sec. 207; Sec. 113. Extent to which assistance reflect appropriate emphasis on; (1) encouraging development of democratic, economic, political and social institutions; (2) self-help in meeting the country's food needs; (3) improving availability of trained worker-power in the country; (4) programs designed to meet the country's health needs; (5) other important areas of economic, political, and social development, including industry; free labor unions, cooperatives, and Voluntary Agencies; transportation and communication; planning and public administration; urban development, and modernization of existing laws; or (6) integrating women into the recipient country's national economy.

The project reflects emphasis upon self-help in meeting the country's food needs and in trained worker power to sustain a program of continued generation of technology that will contribute to all consumers of food. It is well documented that the poorer benefit the greatest in improved efficiency of food production. As to (6), women play a major role at all levels in the development programs of the GRP.

f. 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 civic education and training in skills required for effective participation in governmental and political processes essential to self-government.

The project is designed to assist the GRP in developing the capacities of its people to sustain a development oriented research program which is the utilization of its intellectual resources in institutional development.

g. FAA Sec. 201(b)(2)-(4) and -(8); Sec. 201(e); Sec. 211(a)(1)-(3) and -(8). 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; or of educational or other institutions directed toward social progress? Is it related to and consistent with other development activities, and will it contribute to realizable long-range objectives? And does project paper provide information and conclusion on an activity's economic and technical soundness?

Yes to all questions. This project represents one of the most effective methods of helping any country in increasing its capacity for self-sustained growth in economic and educational progress. The Project Paper provides the information desired.

h. FAA Sec. 201(b)(6); Sec. 211(a)(5), (6). Information and conclusion of U.S. economy, with special reference to areas of substantial labor surplus, and extent to which U.S. commodities and assistance are furnished in a manner consistent with improving or safeguarding the U.S. balance-of-payments position.

Much of the training and most of the commodities will be procured from the U.S. Some of the research undertaken is also of interest to U.S. since it provides information of critical interest to protecting selected U.S. crops which are susceptible.

2. Development Assistance Project Criteria (Loans only)

a. FAA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within U.S.

Financing is not considered available for the purpose of this loan.

b. FAA Sec. 201(b)(2); 201(d). Information and conclusion on (1) capacity of the country to repay the loan, including reasonableness of repayment prospects, and (2) reasonableness and legality (under laws of country and U.S.) of lending and relending terms of the loan.

The prospects for repayment are good. The terms are legal in both the U.S. and the Philippines.

c. FAA Sec. 201(e). If loans is not made pursuant to a multilateral plan, and the amount of the loan exceeds \$100,000, has country submitted to AID an application for such funds together with assurances to indicate that funds will be used in an economically and technically sound manner?

Yes

d. FAA Sec. 201(f). Does project paper describe how project will promote the country's economic development taking into account the country's human and material resources requirements and relationship between ultimate objectives of the project and overall economic development?

Yes

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Manila, Philippines

ANNEX N
1 page only

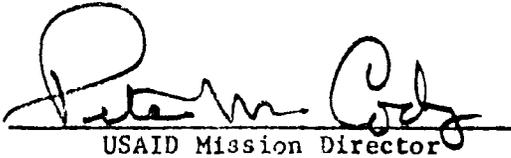
Ramon Magsaysay Center
1680 Roxas Boulevard

Telephone: 59-80-11

Mission Director's Certification

I, Peter M. Cody, the Principal Officer of the Agency for International Development in the Philippines, having taken into account, inter alia, the maintenance and utilization of the Projects in the Philippines previously financed or assisted by the United States, do hereby certify that, in my judgment, the Philippines has both the financial capacity and the human resources capability to effectively implement and execute the proposed Agriculture Research Loan II.

This judgment is based upon the project description and analyses as presented in the Agriculture Research Loan II Project Paper and is subject to the conditions imposed therein.



USAID Mission Director

12-22-78

Date

Republic of the Philippines
NATIONAL ECONOMIC AND DEVELOPMENT AUTHORITY
P.O. Box 116, Manila

ANNEX 0
Page 1 of 4 pages

Tels 50-39-71 to 95
Cable Address: NEDAPHIL

December 18, 1978

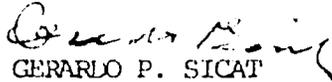
Mr. Peter M. Cody
Director, USAID Mission
Manila

Dear Mr. Cody,

I refer to our letter dated August 28, 1978 and USAID letter of November 16, 1978, copies attached, regarding proposed amendments to the Agricultural Research II Project Paper.

Following our review of the amended project paper, this Office endorses the amendments and consequently requests a US\$ 10 million loan for this project.

Sincerely yours,


GERARDO P. SICAT
Minister of Economic Planning
(Director-General)

November 16, 1978

Mr. Bienvenido G. Villavicencio
Director, External Assistance Staff
National Economic and Development Authority
Padre Faura, Ermita
Manila

Dear Mr. Villavicencio:

Enclosed herein is a copy of the slightly revised draft Project Paper (PP) for the Agricultural Research II Project. The changes and/or additions to the draft copy previously reviewed and endorsed by NEDA, per the letter of August 28, 1978 from Acting Director General Manuel M. Alba to the Director of USAID, include:

1. Allocation of more fellowships in favor of smaller agricultural institutions in the research network as well as an increased level of graduate degree training in animal production, fisheries and forestry as proposed by NEDA in their endorsement letter.
2. Revised funding schedules to make the Fixed Amount Reimbursement Agreements workable.
3. Addition of Conditions Precedent and Covenants.
4. Addition of annexes missing from the previously reviewed draft PP.

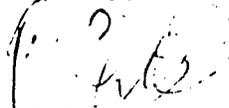
These revisions/additions were prepared in close collaboration with PCARR.

There remains one additional necessary annex before the PP can be forwarded to A.I.D./Washington, following NEDA approval. This is the official letter of request for assistance from NEDA.

- 2 -

We hope that the PP can be forwarded to AID/Washington by December 6 to avoid delays associated with the Christmas holiday season. Your cooperation in meeting this time frame would be greatly appreciated. If we can assist in any way, please contact me.

Sincerely,



Daniel L. Leaty
Acting Program Officer

August 28, 1978

The Director
United States Agency for
International Development
Roxas Boulevard, Manila

S i r :

The second phase of loan assistance to the Philippine Council for Agriculture and Resources Research (PCARR) is designed to build up the local research capability that could generate a new technology applicable to the problems of the small farmers. Specifically, its primary objective is to improve the research capabilities of eight (8) research centers. Basically, the project components are technical services, manpower training, provision of field and laboratory equipment/facilities and infrastructure development. Estimated total project cost is about US\$41.8 million of which US\$10.0 million is intended for USAID loan.

While we are indorsing the loan proposal, we would like to suggest that in order for PCARR to attain the objective of decentralizing research activities in the country, readjustments in the allocation of fellowships in favor of small agricultural institutions included in the PCARR research network should be made. We feel that UPLB and CILSU are well-staffed in terms of technical capabilities. Besides, the two (?) universities are currently the recipients of several foreign-assisted projects designed to upgrade their manpower resources.

Furthermore, the proposed local program for M.S. and PhD's appears to be overly concentrated on crops. In view of the agricultural diversification strategy being adopted by the government, it is suggested that equal emphasis should also be given to animal production, fisheries and forestry.

Thank you and regards.

Very truly yours,


MANUEL M. ALBA

Acting Director General

ANNEX P

DRAFT OF PROJECT DESCRIPTION

A loan of up to Ten Million United States dollars (\$10,000,000) is provided in split tranche funding to assist the Republic of the Philippines in strengthening the national research capability in eight research centers to research, verify and disseminate information on new and improved technologies to Filipino farmers, thereby contributing to self-sufficiency in key agricultural commodities and to increase small farmer income.

The Project will be implemented within the Republic of the Philippines by the Philippine Council for Agricultural and Resources Research (PCARR) in cooperation with the eight identified Centers. The Director General of the PCARR will be the senior government official serving as the coordinator on behalf of the Borrower. He will be assisted by two Deputy Director Generals, one responsible for program development and operations and one responsible for development of the Research Centers. In these capacities, this team representing PCARR will be the official channel for communications between AID and the implementing Research Centers. NEDA will serve as the official Borrower's representative and will make interagency arrangements for the financing of local currency costs.

A. GRP Contributions

1. The Borrower, through NEDA and PCARR, will provide adequate local currency funds for carrying out the infrastructure development planned at each Research Center, for both the forty six percent (46%) to be established under Fixed Amount Reimbursement Agreements and the fifty-four percent (54%) to be established by the Borrower. Adequate funding will be provided to ensure completion to an operational level by the end of the third year, of all infrastructure to be assisted with loan funds. It is envisioned that the initial construction will begin within eight months from execution of the Loan Agreement. All infrastructure development at all Centers will be completed before the end of the project. Submission of a schedule of infrastructure development is a condition precedent to disbursement in the Project Loan Agreement.
2. Operation and Maintenance Budgets - Provision of annual operation and maintenance budgets for conduct of research at each Research Center will be the responsibility of PCARR and the Centers which are predominately colleges of agriculture.
3. Staffing - The Borrower, through PCARR and the Research Centers, will provide adequate person-power to meet supporting nonprofessional staff requirements of the Centers for all research, training, monitoring, logistics and outreach activities. PCARR will ensure that sufficient professional personnel are made available for monitoring infrastructure development. PCARR will also ensure that the loan funds provided for technical assistance will be used to make professional personnel available for planning, training, evaluation and special studies associated with development of the Research Centers.

B. The AID Loan will provide funding for:

	<u>Estimated Cost</u> (000 US)
Laboratory and field research equipment	2,289.0
Library references, journals and materials	299.0
Training research personnel	2,165.0
In-country academic	(1,196)
International academic	(343)
Up-grading, refresher courses	(456)
Observational and participation in workshops and conferences	(170)
Technical Assistance	245.0
International consultants	(120)
In-country consultants	(125)
Infrastructure development	5,002.00
Laboratories, experimental fields, drainage, power, water supply, staff houses, green and screen houses	
Total	\$ 10,000.0

1. Laboratory, Field Research Equipment and Library Resources

To ensure that the Research Centers are adequately equipped, \$2,588,000 (25.9 percent) of the loan fund will be used for procurement of commodities. Commodity requirements were developed by the Borrower and specifications for many of the items are already known. Responsibility for completion of the specifications is that of PCARR in cooperation with the personnel of the Research Centers. Preparation of the IFB's will be that of PCARR with USAID assistance. Procurement will follow guidelines as provided in AID Handbook 11, Chapter 3. All procurement should be completed prior to the end of the third year of the project.

2. Training

The number of trained research personnel necessary to staff the Research Centers has been determined by a detailed nation wide person-power survey. To ensure the trained personnel needed, \$1,539,000 (15.4%) of the loan funds will provide for participant training at the graduate level. The majority (78%) of the training funds will be for training conducted in-country with seven Ph.D. slots reserved for training in the U.S. in highly specialized areas that cannot be adequately offered in the Philippines at this time. Additionally \$456,000 (4.6%) of the loan funds will provide upgrading and refresher courses for intermediate periods of six to 12 months at international research centers and U.S. institutions. The remainder of the training funds, \$170,000 (1.7%) will provide for observational training tours and attendance at international research workshops/conferences.

Recruitment of qualified candidates for the training programs is the responsibility of PCARR in cooperation with the Research Centers. An

assurance that enough fully qualified candidates will be available is a covenant of the Loan Agreement.

International training will involve identification and submission of candidates to NEDA who will review and nominate to AID. AID will review and if approved, the AID Training Office will assist in preparing documentation and placement as needed. To ensure understanding on the part of both the Borrower and AID, a detailed procedural plan for utilization of this component of the loan is a condition precedent of the Loan Agreement.

3. Infrastructure

To ensure that the Research Centers have sufficient basic infrastructure to operate within a reasonable time frame, \$5,002,000 (50%) of the loan funds will partially fund research laboratories, greenhouses, screenhouses, service and processing structures, experimental farm site development, water supply, sewage, power distribution and staff housing at the Research Centers. The GRP contribution to infrastructure development will be \$5,848,000 or 54% of the total infrastructure costs. Seventeen percent of the infrastructure costs are allocated to staff housing which is considered essential in order to attract and retain an increased and more competent staff at the outlying Research Centers. Another 13.7% is allocated to development of the experimental farm fields to service an increased level of research.

Infrastructure partially financed by loan funds will be financed on a Fixed Amount Reimbursement Agreement (FARA) basis. Reimbursement will be made only for completed, accepted structures in operational condition for which prior agreement has been arranged relative to plans, specifications and costs as defined in sub-project agreements. In no case shall reimbursement exceed 75 percent of the agreed upon costs for infrastructure at the Research Centers.

The infrastructure development schedule calls for completion of that portion to be partially financed from the loan to be completed before the end of the third year with all infrastructure in the project completed by the end of the fifth year. The use of the FARA procedure places responsibility upon the Borrower for providing adequate funding levels during the first two years of the project in order to achieve the scheduled use of loan funds.

4. Technical Assistance

Assistance in the form of consultants from both off-shore sources and in-country sources will be obtained on an intermittent basis during the life of the project. Consultants will be used to address specific problems in research, research administration, evaluation and conduct of economic-socio investigation relevant to technology transfer to farmers. Assistance will be given to the new outlying Centers and cooperating stations in design and implementation of research while permanent staff are being trained. Consultants will be contracted by PCARR and satisfactory contract formats are to be developed as a condition

precedent to disbursement. AID retains approval rights for all contracts and contracting activities will conform to AID Handbook II. For in-country consultants, PCARR will pay in Pesos and upon submission of vouchers and the final report, request reimbursement from AID.

By the end of the Project, it is planned that the eight Research Centers will be fully organized and have completed the planned physical facilities; core staff will have completed training; the Centers adequately equipped and conducting research to service regional and national research priorities; a functioning research information retrieval and dissemination system established and servicing the Centers; PCARR fully staffed and operational with increasing effectiveness in maximizing the impact of research on economic growth; research more problem oriented and responsive to problems of small farmers; and closer and more effective interaction of the research and extension services, resulting in more rapid adoption of research findings by farmers.

A detailed description of the planned costs is presented by inputs, in the table set forth in Attachment I to Annex I. The table depicts the estimated costs to the Borrower and disbursements from the Loan for activities under each of the Project inputs.

Summary Cost Estimate and Financial Plan
 Agricultural Research II
 Project No. 492-0286-ASIA BUREAU CODE

Attachment I
 ANNEX P

Components	FY - 79			(000) FY - 80			FY - 81			FY - 82		
	AID-FX	AID-LC	GRP-LC	AID-FX	AID-LC	GRP-LC	AID-FX	AID-LC	GRP-LC	AID-FX	AID-LC	GRP-LC
Operations	-	-	4,016	-	-	4,443	-	-	4,999	-	-	5,736
Infrastructure	-	100	(2,100)*	-	2,000	(2,902)*	-	2,902	(3,849)*	-	-	2,000
Equipment	-	-	-	607	-	-	1,682	-	-	-	-	-
Library	-	-	-	100	-	-	199	-	-	-	-	-
Training	-	-	-	-	-	-	-	-	-	-	-	-
In-country	-	134	-	-	284	-	-	340	-	-	297	-
International	364	-	-	371	-	-	170	-	-	64	-	-
Technicians	8	12	-	8	12	-	42	101	-	18	-	-
SUB TOTALS	372	246	6,116	1,086	2,296	7,345	2,093	3,343	8,848	82	297	7,736

Components	FY - 83			TOTALS			
	AID-FX	AID-LC	GRP-LC	AID-FX	AID-LC	GRP-LC	OVERALL
Operations	-	-	6,806	-	5,00	26,000	26,000
Infrastructure	-	-	-	-	5,002	5,849	10,851
Equipment	-	-	-	2,289	-	-	2,289
Library	-	-	-	299	-	-	299
Training	-	-	-	-	-	-	-
In-country	-	141	-	-	1,196	-	1,196
International	4	-	-	969	-	-	969
Technicians	44	-	-	120	125	-	245
SUB-TOTALS	44	141	6,806	3,677	6,323	31,849	41,849

AID-FX costs include an inflation factor of 6%. The GRP remains responsible to accommodate any inflation and contingency factors within local currency costs.

* Portion of these GRP-LC expenditures will be reimbursed under Fixed Amount Reimbursement Agreements.

Project Authorization

Name of Country: Philippines

Name of Project: Agriculture
Research Loan II

Number of Project: 492-0285

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a loan to the Government of the Republic of the Philippines of not to exceed Ten Million United States Dollars (\$10,000,000), (the "authorized amount") to help in financing foreign exchange and certain local currency costs of goods and services required for the project as described in the following paragraph.

The project consists of developing and/or improving eight Agricultural Research Centers to research, verify, and disseminate information and improved and/or new agricultural technology to small farmers. Agricultural research includes crops, livestock, agro-forestry, soils and water, fisheries and related socio-economic studies.

I approve the level of AID appropriated funding for this project of not to exceed Five Million United States Dollars (\$5,000,000) Loan funded, included in the funding authorized above during the period FY 1979. I approve a further increment AID appropriated funding for this project of not to exceed Five Million United States Dollars (\$5,000,000) prior to or during the period FY 1981, subject to the availability of funds in accordance with AID allotment procedures.

I hereby authorize the initiation of negotiations and execution of the Loan Agreement by the officer to whom such authority has been delegated in accordance with AID regulations and Delegation of Authority subject to the following essential terms and conditions, together with such other terms and conditions as AID may deem appropriate.

A. Interest Rate and Terms of Repayment

The Borrower shall repay the Loan to AID in United States Dollars within forty (40) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years.

The Borrower shall pay to AID in United States Dollars interest from the date of first disbursement of the Loan at the rate of (1) two percent (2%) per annum during the first ten (10) years, and (2) three (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

B. Source and Origin of Goods and Services

Goods and services except for ocean shipping and except as authorized in paragraph F. below, and except as AID may agree in writing, financed

by AID under the project shall have their source and origin in countries included in AID Geographic Code 941 countries. The goods and services procured in the Republic of the Philippines will be limited to those defined in the Agriculture Research Loan II Project Paper. Ocean shipping financed under the Loan shall be procured in any eligible source country except the Republic of the Philippines.

C. Conditions Precedent to Commitments/Disbursement

1. Prior to disbursement or the issuance of any document of commitment under the Loan Agreement, the Borrower shall furnish in form and substance satisfactory to AID:
 - a. Contract format(s) for procurement of technical services, for both in-country and out of country consultants.
 - b. A basic minimal list of laboratory and field research equipment and library references deemed essential for the conduct of research at each regional center. The list will be compared to existing inventories at each center and deficits included in the commodity procurement component.
 - c. Detailed schedule for construction of loan assisted infrastructure at each site in consonance with the goal or completing it within three years.
 - d. Such other conditions as AID may deem advisable.

D. Covenants

1. To the maximum extent possible design and specification for infrastructure developed under Loan I will be utilized in order to achieve cost reduction and accelerate implementation.
2. Baseline data for each research center and for the surrounding service area, as proposed in the Evaluation Plan, Annex K, will be completed within twelve months following execution of the Loan Agreement.
3. The approved operational budgets for research in agriculture, forestry, and fisheries will be provided USAID annually, showing the breakdown on personnel and operational costs.
4. That the technical services will be utilized as scheduled in the Project Paper.
5. That arrangements will be made to ensure that adequate numbers of qualified candidates for training are available to fill the positions as scheduled.

E. Procurement Waiver Approved

A waiver for procurement sources from AID Geographic Code 941 to Geographic Code 935 for the purchase of:

1. selected scientific references and journals;
2. approximately ten (10) single lens reflex cameras and normal accessories; and,
3. approximately two (2) 16 mm movie cameras and projectors.

Subject items are essential to conduct of the project in the field and items of similar specifications are not available from eligible Geographic Code 941 sources.

A waiver for procurement of approximately twelve (12) hand-held electronic calculators for use in field locations where electric current is sporadic is requested. These calculators will be of U.S. source and origin.

492 0286

OPTIONAL FORM NO. 10
MAY 1962 EDITION
GSA FPMR (41 CFR) 101-11.6

UNITED STATES GOVERNMENT

Memorandum

TO : Distribution

DATE: March 16, 1979

FROM : ASIA/PD/EA, J. R. Nussbaum

SUBJECT: Authorization of Philippine Projects:
Freshwater Fisheries Development 492-0322
Agricultural Research II 492-0286

Attached is copy of subject document signed by AA/ASIA, John H. Sullivan
March 13, 1979.

Distribution:

ASIA/PD:GRVanPaukte, MM Pehl
PPC/PDPR:RMalley
PPC/PB/PDS:NCopeland
FM/LD:ASmith
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GC/ASIA:HMorris
ASIA/TR:TMarndt
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ASIA/DP:RLeonard (2)
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DS/DIU(2)
USAID/PHILIPPINES



5010-108

Buy U.S. Savings Bonds Regularly on the Payroll Savings Plan

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

13 MAR 1979

ACTION MEMORANDUM FOR THE ASSISTANT ADMINISTRATOR, ASIA BUREAU

FROM: Dennis J. Brennan **DB**
SUBJECT: Authorization of Philippine Projects:
Freshwater Fisheries Development (492-0322)
Agricultural Research II (492-0286)

Problem: Your authorization is required for two Philippine projects.

Discussion: On February 16 the APAC approved Project Papers for the Philippine Freshwater Fisheries Development and Agricultural Research II Projects. The APAC revised project designs in the PPs as follows:

Freshwater Fisheries -- a requested waiver for purchase of motorcycles from non-U.S. source was not approved although no U.S. source vehicle satisfactory for the project could be found. Other funds will have to be found for these vehicles (about 15 vehicles worth about \$10,000 are involved).

Agricultural Research II -- Before disbursing project funds for construction, equipment or training, a joint GRP-AID evaluation of Agricultural Research I will be required. In addition, the GRP will be required to covenant that funds will be made available on a timely basis for construction of infrastructure for which reimbursement under the project will be financed.

The attached Project Authorizations have been prepared reflecting the above design revisions and minor changes in form from the draft authorizations submitted with the PPs. If you sign these Project Authorizations, you will approve funding as follows:

Freshwater Fisheries -- In FY 1979-1980, \$1,500,000 life-of-project, of which \$400,000 is immediately authorized.

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I	1. TRANSACTION CODE <input type="checkbox"/> A A - ADD <input type="checkbox"/> C C - CHANGE <input type="checkbox"/> D D - DELETE	PAF 2. DOCUMENT CODE 5
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3. COUNTRY/ENTITY Philippines	4. DOCUMENT REVISION NUMBER <input type="checkbox"/>
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5. PROJECT NUMBER (7 digits) <input type="checkbox"/> 492-0322 <input type="checkbox"/>	6. BUREAU/OFFICE A. SYMBOL ASIA	B. CODE <input type="checkbox"/> 04 <input type="checkbox"/>	7. PROJECT TITLE (Maximum 40 characters) <input type="checkbox"/> Freshwater Fisheries Development <input type="checkbox"/>
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8. PROJECT APPROVAL DECISION ACTION TAKEN <input type="checkbox"/> A A - APPROVED <input type="checkbox"/> D D - DISAPPROVED <input type="checkbox"/> DE DEAUTHORIZED	9. EST. PERIOD OF IMPLEMENTATION YRS. <input type="checkbox"/> 05 <input type="checkbox"/> QTRS. <input type="checkbox"/> 0 <input type="checkbox"/>
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10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>79</u>		H. 2ND FY <u>80</u>		K. 3RD FY	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	B322	319		400		1,100			
(2)									
(3)									
(4)									
TOTALS				400		1,000			

A. APPROPRIATION	N. 4TH FY		Q. 5TH FY		LIFE OF PROJECT		PROJECT FUNDING AUTHORIZED	A. GRANT	B. LOAN
	O. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN			
(1) FN					1,500		ENTER APPROPRIATE CODE(S) 1 - LIFE OF PROJECT 2 - INCREMENTAL LIFE OF PROJECT		
(2)									
(3)							PROJECT FUNDING AUTHORIZED THRU FY <input type="checkbox"/> 80 <input type="checkbox"/>		
(4)									
TOTALS					1,500				

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)	13. FUNDS RESERVED FOR ALLOTMENT																				
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">A. APPROPRIATION</th> <th colspan="2">B. ALLOTMENT REQUEST NO. _____</th> </tr> <tr> <th>C. GRANT</th> <th>D. LOAN</th> </tr> </thead> <tbody> <tr> <td>(1) FN</td> <td>400</td> <td></td> </tr> <tr> <td>(2)</td> <td></td> <td></td> </tr> <tr> <td>(3)</td> <td></td> <td></td> </tr> <tr> <td>(4)</td> <td></td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;">TOTALS</td> <td>400</td> </tr> </tbody> </table>	A. APPROPRIATION	B. ALLOTMENT REQUEST NO. _____		C. GRANT	D. LOAN	(1) FN	400		(2)			(3)			(4)			TOTALS		400	TYPED NAME (Chief, SER/FM/FSD) _____ SIGNATURE _____ DATE _____
A. APPROPRIATION		B. ALLOTMENT REQUEST NO. _____																			
	C. GRANT	D. LOAN																			
(1) FN	400																				
(2)																					
(3)																					
(4)																					
TOTALS		400																			

14. SOURCE/ORIGIN OF GOODS AND SERVICES
 000
 941
 LOCAL
 OTHER See Part II

15. FOR AMENDMENTS NATURE OF CHANGE PROPOSED

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL AA/ASIA	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY
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PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS

PART II

PHILIPPINES

Freshwater Fisheries
Development
A.I.D. Project No.
492-0322

Pursuant to Part I, Chapter I, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a Grant to the Government of the Republic of the Philippines (the "Cooperating Country") of not to exceed Four Hundred Thousand United States Dollars (\$400,000) (the "authorized amount") to help in financing certain foreign exchange and local currency costs of goods and services required for the project as described in the following paragraph.

The Fresh Water Fisheries project (hereinafter referred to as the "Project") consists of establishing a Freshwater Fish Hatchery-Extension Training Center (FFH-ETC) to support and increase freshwater fish production and consumption in the Central Luzon area of the Cooperating Country.

I approve the total level of A.I.D.-appropriated funding planned for this Project of not to exceed One Million Five Hundred Thousand United States Dollars (\$1,500,000), including the funding authorized above, which will be grant-funded during the period FY 1979 thru FY 1980. I approve further increments during that period of grant-funding of not to exceed One Million One Hundred Thousand United States Dollars (\$1,100,000), subject to the availability of funds and in accordance with A.I.D. allotment procedures.

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

A. Source and Origin of Goods and Services

Except for ocean shipping and except as authorized in Paragraph D. below and except as A.I.D. may otherwise agree in writing, goods and services financed by A.I.D. under the Project shall have their source and origin in the United States of America or in the Cooperating Country. Ocean shipping financed under the Grant shall be procured in accordance with current A.I.D. regulations.

B. Conditions Precedent

Prior to disbursement under the Grant, or to the issuance by A.I.D. of any documentation pursuant to which disbursement will be made, for the purpose of financing goods and services for the Project (except for the USAID Project Manager) the Cooperating Country will present evidence in form and substance satisfactory to A.I.D. that:

- a. The FFH-ETC facilities will be substantially completed within a six-month period after signing the Project Agreement. An executed contract between the GRP and a construction firm with construction initiated would be satisfactory.
- b. That adequate staff housing for both long and short-term Advisors will be available at Central Luzon State University (CLSU). A memorandum of agreement providing for utilization of CLSU staff facilities on an availability basis would be satisfactory.
- c. That qualified managerial and professional staff will be assigned to the FFH-ETC and that they will be available for long and short-term participant training as described in the Project Paper. An exchange of letters between USAID and the Bureau of Fisheries and Aquatic Resources identifying actual or potential incumbents for the staff positions and presenting bio-data for each will be satisfactory evidence of intent.
- d. That the GRP will charge a nominal fee for fish seedlings produced at the FFH-ETC and distributed to private individuals.

C. Covenants

- a. The Cooperating Country covenants to support staff and budgets for annual operation and maintenance of the FFH-ETC throughout the life of the Project.
- b. The Cooperating Country covenants that participants trained under this Project will be assigned to positions which support Project objectives through the life of the Project unless concurrence by USAID in the discontinuance of their service under the Project is obtained.

D. Procurement Waivers

On the basis that exclusion of procurement from Free World countries other than the Cooperating Country and countries included in Code 941 would obviously impede attainment of U.S. Foreign Policy objectives and objectives of the Foreign Assistance program, a waiver is hereby authorized for procurement sources and origin from A.I.D. Geographic Code 941 to Geographic Code 935 for the purchase of:

1. Twelve (12) 35 mm SLR cameras to service the needs of the Training Center and the Extension Agents; and
2. Ten (10) hand-held calculators for use by field extension workers making on-the-site calculations.

<u>Clearances</u>	<u>Office Symbol</u>	<u>Date</u>	<u>Initials</u>
D. J. Brennan	ASIA/PD	3/12/79	LB
M. A. Doyle	ASIA/TR		
C. Johnson	ASIA/DP	3/12/79	
R. Nachtrieb	ASIA/PT	6/10/79	
H. Morris	GC/ASIA		
F. Schieck	DAA/ASIA		

Signature _____

John H. Sullivan
Assistant Administrator
Bureau for Asia

AGENCY FOR INTERNATIONAL DEVELOPMENT PROJECT AUTHORIZATION AND REQUEST FOR ALLOTMENT OF FUNDS PART I	1. TRANSACTION CODE <input type="checkbox"/> A A - ADD <input type="checkbox"/> C C - CHANGE <input type="checkbox"/> D D - DELETE	PAF 2. DOCUMENT CODE 5
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3. COUNTRY/ENTITY Philippines	4. DOCUMENT REVISION NUMBER <input type="checkbox"/>
5. PROJECT NUMBER (7 digits) <input type="checkbox"/> 492-0286 <input type="checkbox"/>	6. BUREAU/OFFICE A. SYMBOL B. CODE ASIA <input type="checkbox"/> 04 <input type="checkbox"/>
8. PROJECT APPROVAL DECISION <input type="checkbox"/> A A - APPROVED <input type="checkbox"/> D D - DISAPPROVED <input type="checkbox"/> DE DE - DEAUTHORIZED	7. PROJECT TITLE (Maximum 40 characters) <input type="checkbox"/> Agricultural Research II <input type="checkbox"/>
9. EST. PERIOD OF IMPLEMENTATION YRS. <input type="checkbox"/> 0 <input type="checkbox"/> 6 QTRS. <input type="checkbox"/> 0	

10. APPROVED BUDGET AID APPROPRIATED FUNDS (\$000)									
A. APPROPRIATION	B. PRIMARY PURPOSE CODE	PRIMARY TECH. CODE		E. 1ST FY <u>79</u>		H. 2ND FY <u>80</u>		K. 3RD FY <u>81</u>	
		C. GRANT	D. LOAN	F. GRANT	G. LOAN	I. GRANT	J. LOAN	L. GRANT	M. LOAN
(1) FN	B141		080		4,000				6,000
(2)									
(3)									
(4)									
TOTALS					4,000				6,000

A. APPROPRIATION	N. 4TH FY		Q. 5TH FY		LIFE OF PROJECT		PROJECT FUNDING AUTHORIZED		
	O. GRANT	P. LOAN	R. GRANT	S. LOAN	T. GRANT	U. LOAN	ENTER APPROPRIATE CODE(S):	A. GRANT	B. LOAN
(1) FN						10,000	1 - LIFE OF PROJECT		
(2)							2 - INCREMENTAL LIFE OF PROJECT		
(3)									
(4)									
TOTALS						10,000			811

12. INITIAL PROJECT FUNDING ALLOTMENT REQUESTED (\$000)	13. FUNDS RESERVED FOR ALLOTMENT
A. APPROPRIATION B. ALLOTMENT REQUEST NO. _____ C. GRANT D. LOAN	TYPED NAME (Chief, SER/FM/FSD)
(1) FN	4,000
(2)	
(3)	
(4)	
TOTALS	
	4,000

14. SOURCE/ORIGIN OF GOODS AND SERVICES 000 941 LOCAL OTHER see Part I

15. FOR AMENDMENTS, NATURE OF CHANGE PROPOSED

FOR PPC/PIAS USE ONLY	16. AUTHORIZING OFFICE SYMBOL AA/ASIA	17. ACTION DATE MM DD YY	18. ACTION REFERENCE (Optional)	ACTION REFERENCE DATE MM DD YY
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Project Authorization and Request for Allotment of Funds

Part II

PHILIPPINES

Agricultural
Research Loan II
A.I.D., Project
No. 497-0286

Pursuant to Part I, Chapter 1, Section 103 of the Foreign Assistance Act of 1961, as amended, I hereby authorize a loan to the Government of the Republic of the Philippines (the "Borrower") of not to exceed Four Million United States Dollars (\$4,000,000), (the "authorized amount") to help in financing foreign exchange and certain local currency costs of goods and services required for the project as described in the following paragraph.

The Agricultural Research Loan II project (hereinafter referred to as the "Project") consists of developing and/or improving eight Agricultural Research Centers to research, verify, and disseminate information and improved and/or new agricultural technology to small farmers. Agricultural research includes crops, livestock, agro-forestry, soils and water, fisheries and related socio-economic studies.

I approve the total level of A.I.D.-appropriated funding planned for this project of not to exceed Ten Million United States Dollars (\$10,000,000), including the funding authorized above, which will be entirely loan-funded during the period FY 1979 through FY 1981. I approve further increments during the period of loan funding up to a total of six Million United States Dollars (\$6,000,000), subject to the availability of funds and in accordance with A.I.D. allotment procedures.

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

A. Interest Rate and Terms of Repayment

The Borrower shall repay the Loan to A.I.D. in United States Dollars within forty (40) years from the date of first disbursement of the Loan, including a grace period of not to exceed ten (10) years.

The Borrower shall pay to A.I.D. in United States Dollars interest from the date of first disbursement of the Loan at the rate of (1) two percent (2%) per annum during the first ten (10) years, and (2) three percent (3%) per annum thereafter, on the outstanding disbursed balance of the Loan and on any due and unpaid interest accrued thereon.

B. Source and Origin of Goods and Services

Except for ocean shipping and except as authorized in paragraph E. below, and except as A.I.D. may agree in writing, goods and services financed by A.I.D. under the project shall have their source and origin in countries included in A.I.D. Geographic Code 941 and in the country of the Borrower. The goods and services procured in the country of the Borrower will be limited to those defined in the Agricultural Research Loan II Project Paper. Ocean shipping financed under the Loan shall be procured in accordance with current A.I.D. regulations.

C. Conditions Precedent to Commitments/Disbursement

1. Prior to disbursement under the loan or the issuance by A.I.D. of any documentation pursuant to which disbursement will be made for the purpose of financing goods and services for the Project, the Borrower shall furnish in form and substance satisfactory to A.I.D.:
 - a. Contract format(s) for procurement of technical services, for both in-country and out-of-country consultants.
 - b. A basic minimal list of laboratory and field research equipment and library references deemed essential for the conduct of research at each regional center. The list will be compared to existing inventories at each center and deficits included in the commodity procurement component.
 - c. Detailed schedule for construction of loan-assisted infrastructure at each site in consonance with the goal of completing it within three years.

2. Prior to disbursement under the Loan, or the issuance of any documentation pursuant to which disbursement will be made, for the purpose of financing construction, training or equipment for the Project, the Borrower and A.I.D. shall complete an evaluation of the progress and achievements under the Agricultural Research I Loan.

D. Covenants

The Borrower shall covenant that:

1. Funds will be made available on a timely basis for the construction of loan-assisted infrastructure in accordance with the schedule for construction.
2. To the maximum extent possible design and specification for infrastructure developed under Loan I will be utilized in order to achieve cost reductions and accelerate implementation.
3. Baseline data for each research center and for the service area, as proposed in the Evaluation Plan, Annex K, will be completed within twelve months following execution of the Loan Agreement.
4. The approved operational budgets for research in agriculture, forestry, and fisheries will be provided USAID annually, showing the breakdown on personnel and operational costs.
5. The technical services will be utilized as scheduled in the Project Paper.
6. Arrangements will be made to ensure that adequate numbers of qualified candidates for training are available to fill the positions as scheduled.

E. Procurement Waivers

On the basis that exclusion of procurement from Free World countries other than the cooperating country and countries included in Code 941 would obviously impede attainment of U.S. Foreign Policy objectives and objectives of the Foreign Assistance program, a waiver is hereby authorized for procurement sources and origin from A.I.D. Geographic Code 941 to Geographic Code 935 for the purchase of:

UNITED STATES GOVERNMENT

Memorandum

TO : Distribution

DATE: August 30, 1979

FROM : ASIA/PD/EA, J. R. Nussbaum

SUBJECT: A.I.D. Loan No. 492-T-055 - Project No. 492-0286
Agricultural Research II

Attached for your information and files is copy of the subject document.

Attachment: a/s

Distribution:

FM/LD:ASmith

FM/BFD:JO'Neill

FM/FCD:DBaker

ASIA/PTBI:DChandler, RNachtrieb

GC/ASIA:HMorris

ASIA/PD

DS/DIU (2)



CONFIDENTIAL COPY

A.I.D. Loan No. 492-T-055

A.I.D. Project No. 492-0286

LOAN AGREEMENT
BETWEEN
THE REPUBLIC OF THE PHILIPPINES
and the
UNITED STATES OF AMERICA
for
AGRICULTURAL RESEARCH II

Dated: July 16, 1979

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A.I.D. Loan No. 492-T-055

A.I.D. Project No. 492-0286

PROJECT LOAN AGREEMENT

Dated July 16, 1979

Between

The Republic of the Philippines ("Borrower")

And

The United States of America acting through the
Agency for International Development ("A.I.D.").

Article 1: The Agreement.

The purpose of this Agreement is to set out the understandings of the parties named above ("Parties") with respect to the undertaking by the Borrower of the Project described below, and with respect to the financing of the Project by the Parties.

Article 2: The Project.

Section 2.1. Definition of Project. The Project, which is further described in Annex I, will consist of improving the indigenous research capability in eight research centers to generate and verify in the field new and/or improved technology appropriate for resolving the technical problems of small farmers. Agricultural research includes crops, livestock, agro-forestry, soils and water, fisheries, and related socio-economic studies. Annex I, attached, amplifies the above definition of the Project.

Within the limits of the above definition of the Project, elements of the amplified description stated in Annex I may be changed by written agreement of the authorized representatives of the Parties named in Section 9.2, without formal amendment of this Agreement.

Section 2.2. Incremental Nature of Project.

(a) A.I.D.'s contribution to the Project will be provided in increments, the initial one being made available in accordance with Section 3.1 of this Agreement. Subsequent increments will be subject to availability of funds to A.I.D. for this purpose, and to the mutual agreement of the Parties, at the time of a subsequent increment, to proceed.

(b) Within the overall Project Assistance Completion Date stated in this Agreement, A.I.D., based upon consultation with the Borrower may specify in Project Implementation Letters appropriate time periods for the utilization of funds loaned by A.I.D. under an individual increment of assistance.

Article 3: Financing.

Section 3.1. The Loan. To assist the Borrower to meet the costs of carrying out the Project, A.I.D., pursuant to the Foreign Assistance act of 1961, as amended, agrees to lend the Borrower under the terms of this Agreement not to exceed Five Million United States ("U.S.") Dollars (\$5,000,000.00) ("Loan"). The aggregate amount of disbursements under the Loan is referred to as "Principal".

The Loan may be used to finance foreign exchange costs, as defined in Section 7.1, and local currency costs, as defined in Section 7.2, of goods and services required for the Project.

Section 3.2. Borrower Resources for the Project.

(a) The Borrower agrees to provide or cause to be provided for the Project all funds, in addition to the Loan, and all other resources required to carry out the Project effectively and in a timely manner.

(b) The resources provided by Borrower for the Project will be not less than the equivalent of U.S. \$15,900,000.00, including costs borne on an "in-kind" basis.

Section 3.3. Project Assistance Completion Date.

(a) The "Project Assistance Completion Date" (PACD), which is June 30, 1984, or such other date as the Parties may agree to in writing, is the date by which the Parties estimate that all services financed under the Loan will have been performed and all goods financed under the Loan will have been furnished for the Project as contemplated in this Agreement.

(b) Except as A.I.D. may otherwise agree in writing, A.I.D. will not issue or approve documentation which would authorize disbursement of the Loan for services performed subsequent to the PACD or for goods furnished for the Project, as contemplated in this Agreement, subsequent to the PACD.

(c) Requests for disbursement, accompanied by necessary supporting documentation prescribed in Project Implementation Letters, are to be received by A.I.D. or any bank described in

Section 8.1 no later than nine (9) months following the PACD, or such other period as A.I.D. agrees to in writing. After such period, A.I.D., giving notice in writing to the Borrower, may at any time or times reduce the amount of the Loan by all or any part thereof for which requests for disbursement, accompanied by necessary supporting documentation prescribed in Project Implementation Letters, were not received before the expiration of said period.

Article 4: Loan Terms.

Section 4.1. Interest. The Borrower will pay to A.I.D. interest which will accrue at the rate of two percent (2%) per annum for ten (10) years following the date of the first disbursement hereunder and at the rate of three percent (3%) per annum thereafter on the outstanding balance of Principal and on any due and unpaid interest. Interest on the outstanding balance will accrue from the date (as defined in Section 8.5) of each respective disbursement, and will be payable semiannually. The first payment of interest will be due and payable no later than six (6) months after the first disbursement hereunder, on a date to be specified by A.I.D.

Section 4.2. Repayment. The Borrower will repay to A.I.D. the Principal within forty (40) years from the date of the first disbursement of the Loan in sixty-one (61) approximately equal semiannual installments of Principal and interest. The first installment of Principal will be payable nine and one-half (9½) years after the date on which the first interest payment is

due in accordance with Section 4.1. A.I.D. will provide the Borrower with an amortization schedule in accordance with this Section after the final disbursement under the Loan.

Section 4.3. Application, Currency, and Place of Payment.

All payments of interest and Principal hereunder will be made in U.S. dollars and will be applied first to the payment of interest due and then to the repayment of Principal. Except as A.I.D. may otherwise specify in writing, payments will be made to the Controller, Office of Financial Management, Agency for International Development, Washington, D.C. 20523, U.S.A., and will be deemed made when received by the Office of Financial Management.

Section 4.4. Prepayment. Upon payment of all interest and any refunds then due, the Borrower may prepay, without penalty, all or any part of the Principal. Unless A.I.D. otherwise agrees in writing, any such prepayment will be applied to the installments of Principal in the inverse order of their maturity.

Section 4.5. Renegotiation of Terms.

(a) The Borrower and A.I.D. agree to negotiate, at such time or times as either may request, an acceleration of the repayment of the Loan in the event that there is any significant and continuing improvement in the internal and external economic and financial position and prospects of the Republic of the Philippines, which enable the Borrower to repay the Loan on a shorter schedule.

(b) Any request by either Party to the other to so negotiate will be made pursuant to Section 9.1, and will give the name and address of the person or persons who will represent the requesting Party in such negotiations.

(c) Within thirty (30) days after delivery of a request to negotiate, the requested Party will communicate to the other, pursuant to Section 9.1, the name and address of the person or persons who will represent the requested Party in such negotiations.

(d) The representatives of the Parties will meet to carry on negotiations no later than thirty (30) days after delivery of the requested Party's communication under subsection (c). The negotiation will take place at a location mutually agreed upon by the representatives of the Parties, provided that, in the absence of mutual agreement, the negotiations will take place at the office of Borrower's Director-General, National Economic & Development Authority in the Republic of the Philippines.

Section 4.6. Termination on Full Payment. Upon payment in full of the Principal and any accrued interest, this Agreement and all obligations of the Borrower and A.I.D. under it will cease.

Article 5: Conditions Precedent to Disbursement.

Section 5.1. First Disbursement. Prior to the first disbursement under the Loan, or the issuance by A.I.D. of documentation pursuant to which disbursement will be made, the Borrower will, except as the Parties may otherwise agree in writing, furnish to A.I.D. in form and substance satisfactory to A.I.D.:

(a) An opinion of counsel acceptable to A.I.D. that this Agreement has been duly authorized and/or ratified by, and executed on behalf of, the Borrower, and that it constitutes a valid and legally binding obligation of the Borrower in accordance with all of its terms;

(b) A statement of the name of the person holding or acting in the office of the Borrower specified in Section 9.2, and of any additional representatives, together with a specimen signature of each person specified in such statement;

(c) The evaluation program referred to in Section 6.1;

(d) Example of contract formats to be used for procurement of technical advisory services of both in-country and out-of-country consultants;

(e) A detailed schedule for construction of Loan-assisted infrastructure at each center in consonance with the stated goal of completing it within 36 months following execution of this Agreement;

(f) A basic minimal list of laboratory and field research equipment and library references deemed essential for the conduct of research at each regional center;

(g) An evaluation, conducted as a joint Philippine-U.S. effort, of the Agricultural Research I Project (A.I.D. Loan Agreement 492-T-039);

(h) A procedure for the training component of the Project, for both short and long-term participants, which will include participant nomination, selection, approval and financing arrangements; and

(i) A copy of the work and financial plan (Budget Form 121) approved by The Ministry of the Budget, detailing the financial requirements for the first operational year of the Project.

Section 5.2. Notification. When A.I.D. has determined that the conditions precedent specified in Section 5.1 have been met, it will promptly notify the Borrower.

Section 5.3. Terminal Date for Conditions Precedent. If all of the conditions specified in Section 5.1 have not been met within 120 days from the date of this Agreement, or such later date as A.I.D. may agree to in writing, A.I.D., at its option, may terminate this Agreement by written notice to the Borrower.

Article 6: Special Covenants.

Section 6.1. Project Evaluation. The Parties agree to establish an evaluation program as part of the Project. Except as the Parties otherwise agree in writing, the program will include, during the implementation of the Project and at one or more points thereafter:

(a) Evaluation of progress toward attainment of the objectives of the Project;

(b) Identification and evaluation of problem areas or constraints which may inhibit such attainment;

(c) Assessment of how such information may be used to help overcome such problems; and

(d) Evaluation, to the degree feasible, of the overall development impact of the Project.

Section 6.2. Construction Designs and Specifications. To the maximum extent practicable, designs and specifications for infrastructure developed under the Agricultural Research I Project will be utilized for this Project in order to achieve cost economies and accelerate implementation.

Section 6.3. Baseline Data. Baseline data for each research center and for the surrounding service area, as proposed in the

Evaluation Plan of the A.I.D. Project Paper (Annex L thereof) will be completed within twelve (12) months following execution of this Agreement.

Section 6.4. Operational Budgets. The approved operational budgets for research in agriculture, forestry, and fisheries will be provided annually to A.I.D., showing a breakdown of personnel and operational costs.

Section 6.5. Provision of Borrower Funds. Borrower funds for construction of infrastructure for A.I.D.-reimbursable portions of the Project shall be made on a timely basis in accordance with the construction schedule to be provided pursuant to Section 5.1(e) of this Agreement.

Section 6.6. Utilization of Technical Services. Except as A.I.D. may otherwise agree in writing, the technical services for the Project will be utilized as scheduled in the A.I.D. Project Paper.

Section 6.7. Participant Training. In order to assure timely availability of qualified participants and suitable financial arrangements, the Borrower covenants and agrees to carry out the participant training procedure, approved pursuant to Section 5.1(h) herein, during the life of the Project.

Article 7: Procurement Source.

Section 7.1. Foreign Exchange Costs. Disbursements pursuant to Section 8.1 will be used exclusively to finance the costs of goods and services required for the Project having their source

and origin in countries included in Code 941 of the A.I.D. Geographic Code Book as in effect at the time orders are placed or contracts entered into for such goods and services ("Foreign Exchange Costs"), except as A.I.D. may otherwise agree in writing, and except as provided in the Project Loan Standard Provisions Annex, Section C.1(b) with respect to marine insurance. Ocean transportation costs will be financed under the Loan only on vessels under flag registry of the United States or the Republic of the Philippines, except as A.I.D. may otherwise agree in writing. If A.I.D. determines either that there are no vessels under flag registry of the Republic of the Philippines generally available for ocean transportation, or that the Republic of the Philippines has no access to U.S. flag service, A.I.D. in a Project Implementation Letter may agree to finance under the Loan ocean transportation costs on vessels under flag registry of any country included in A.I.D. Geographic Code 941.

Section 7.2. Local Currency Costs. Disbursements pursuant to Section 8.2 will be used exclusively to finance the costs of goods and services required for the Project having their source and, except as A.I.D. may otherwise agree in writing, their origin in the Republic of the Philippines ("Local Currency Costs"). To the extent provided for under this Agreement, Local Currency Costs may also include the provision of local currency resources required for the Project.

Article 8: Disbursements.

Section 8.1. Disbursement for Foreign Exchange Costs.

(a) After satisfaction of conditions precedent, the Borrower may obtain disbursements of funds under the Loan for the Foreign Exchange Costs of goods or services required for the Project in accordance with the terms of this Agreement, by such of the following methods as may be mutually agreed upon:

(1) by submitting to A.I.D., with necessary supporting documentation as prescribed in Project Implementation Letters, (A) requests for reimbursement for such goods or services, or (B) requests for A.I.D. to procure commodities or services in the Borrower's behalf for the Project; or

(2) by requesting A.I.D. to issue Letters of Commitment for specified amounts (A) to one or more U.S. banks, satisfactory to A.I.D., committing A.I.D. to reimburse such bank or banks for payments made by them to contractors or suppliers, under Letter of Credit or otherwise, for such goods or services, or (B) directly to one or more contractors or suppliers, committing A.I.D. to pay such contractors or suppliers for such goods or services.

(b) Banking charges incurred by the Borrower in connection with Letters of Commitment and Letters of Credit will be financed under the Loan unless the Borrower instructs A.I.D. to the contrary. Such other charges as the Parties may agree to may also be financed under the Loan.

Section 8.2. Disbursement for Local Currency Costs.

(a) After satisfaction of conditions precedent, the Borrower may obtain disbursements of funds under the Loan for Local Currency

Costs required for the Project in accordance with the terms of this Agreement, by submitting to A.I.D., with necessary supporting documentation as prescribed in Project Implementation Letters, requests to finance such costs.

(b) The local currency needed for such disbursement hereunder may be obtained:

(1) by acquisition by A.I.D. with U.S. dollars by purchase or from local currency already owned by the U.S. Government; or

(2) by A.I.D. (A) requesting the Borrower to make available the local currency for such costs, and (B) thereafter making available to the Borrower through the opening or amendment by A.I.D. of Special Letters of Credit in favor of the Borrower or its designee, an amount of U.S. dollars equivalent to the amount of local currency made available by the Borrower, which dollars will be utilized for procurement from the United States under appropriate procedures described in Project Implementation Letters.

The U.S. dollar equivalent of the local currency made available hereunder will be, in the case of subsection (b)(1) above, the amount of U.S. dollars required by A.I.D. to obtain the local currency, and in the case of subsection (b)(2) above, an amount calculated at the rate of exchange specified in the applicable Special Letter of Credit Implementation Memorandum hereunder as of the date of the opening or amendment of the applicable Special Letter of Credit.

Section 8.3. Other Forms of Disbursement. Disbursements of the Loan may also be made through such other means as the Parties may agree to in writing.

Section 8.4. Rate of Exchange. Except as may be more specifically provided under Section 8.2, if funds provided under the Loan are introduced into the Republic of the Philippines by A.I.D. or any public or private agency for purposes of carrying out obligations of A.I.D. hereunder, the Borrower will make such arrangements as may be necessary so that such funds may be converted into currency of the Republic of the Philippines at the highest rate of exchange which, at the time the conversion is made, is not unlawful in the Republic of the Philippines.

Section 8.5. Date of Disbursement. Disbursements by A.I.D. will be deemed to occur:

(a) On the date on which A.I.D. makes a disbursement to the Borrower or its designee, or to a bank, contractor or supplier pursuant to a Letter of Commitment, contract, or purchase order;

(b) On the date on which A.I.D. disburses to the Borrower or its designee local currency acquired in accordance with Section 8.2(b)(1); or

(c) If local currency is obtained in accordance with Section 8.2(b)(2), on the date on which A.I.D. opens or amends the Special Letter of Credit there referred to.

Article 9: Miscellaneous.

Section 9.1. Communications. Except as expressly provided in Section 4.3, any notice, request, document, or other communication submitted by either Party to the other under this Agreement will be in writing or by telegram or cable, and will be deemed duly given or sent when delivered to such party at the following address:

To the Borrower:

Mail Address: National Economic and Development
Authority
P.O. Box 1116, Manila, Philippines

Alternate address for telegrams: NEDAPHIL

To A.I.D.:

Mail Address: United States Agency for International
Development
c/o The American Embassy
Manila, Philippines

Alternate address for telegrams: USAID/AMEMB MANILA

All such communications will be in English, unless the Parties otherwise agree in writing. Other addresses may be substituted for the above upon the giving of notice.

Section 9.2. Representatives. For all purposes relevant to this Agreement, the Borrower will be represented by the individual holding or acting in the office of the Director-General, National Economic and Development Authority and A.I.D. will be represented by the individual holding or acting in the office of the Director, United States A.I.D. Mission to the Philippines, each of whom, by written notice, may designate additional representatives for all

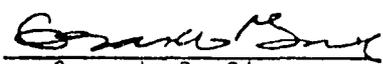
purposes other than exercising the power under Section 2.1 to revise elements of the amplified description in Annex I. The names of the representatives of the Borrower, with specimen signatures, will be provided to A.I.D., which may accept as duly authorized any instrument signed by such representatives in implementation of this Agreement, until receipt of written notice of revocation of their authority.

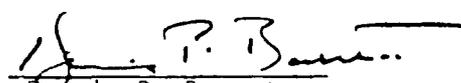
Section 9.3. Standard Provisions Annex. A "Project Loan Standard Provisions Annex" (Annex II) is attached to and forms part of this Agreement.

IN WITNESS WHEREOF, the Borrower and the United States of America, each acting through its duly authorized representative, have caused this Agreement to be signed in their names and delivered as of the day and year first above written.

REPUBLIC OF THE PHILIPPINES

UNITED STATES OF AMERICA

By: 
Gerardo P. Sicat

By: 
Dennis P. Barrett

Title: Minister of Economic Planning
(Director-General)
National Economic &
Development Authority

Title: Acting Director
U.S. Agency for
International Development



ANNEX I - DESCRIPTION OF PROJECT

A loan of up to Ten Million United States dollars (\$10,000,000) is anticipated to be provided in increments to assist the Republic of the Philippines in strengthening the national research capability in eight research centers to research, verify and disseminate information on new and/or improved technologies to Filipino farmers, thereby contributing to self-sufficiency in key agricultural commodities and to increase small farmer income.

The funding schedule will provide: (a) from the A.I.D. Loan, Five Million United States Dollars (\$5,000,000.00) during FY 1979 with an additional increment of Five Million United States Dollars (\$5,000,000.00) prior to or during FY 1981, subject to the availability of funds and the continuing agreement of the Parties; and (b) from the Borrower Fifteen Million Nine Hundred Thousand United States Dollars (\$15,900,000.00) equivalent in Pesos during FY 1979 and FY 1980 with an additional increment of approximately Sixteen Million Two Hundred Thousand United States Dollars (\$16,200,000.00) equivalent in Pesos in accordance with this agreement during the period of FY 1981 through FY 1984.

The Project will be implemented within the Republic of the Philippines by the Philippine Council for Agricultural and Resources Research (PCARR) in cooperation with the eight identified Centers. The Director General of PCARR will be the senior official serving as the coordinator on behalf of the Borrower. He will be assisted by two Deputy Directors General, one responsible for operations

and one responsible for research. In these capacities, this team representing PCARR will be the official channel for communications between A.I.D. and the implementing Research Centers. As in Loan I, A.I.D. will provide an experienced direct hire Project Manager having an agricultural research background to assist in the implementation of the loan.

A. Borrower Contributions.

1. Infrastructure Development.

The Borrower will provide adequate local currency funds for carrying out the infrastructure development planned at each Research Center, for both the forty six percent (46%) to be established under Fixed Amount Reimbursement Agreements and the fifty-four percent (54%) to be established by the Borrower. Adequate funding will be provided to ensure completion to an operational level, by the end of the third year, of all infrastructure to be assisted with loan funds. It is envisioned that the initial construction will begin within eight months from execution of the Loan Agreement. All infrastructure development of all Centers will be completed before the end of the Project. Submission of a schedule of infrastructure development is a condition precedent to disbursement in the Project Loan Agreement.

2. Operation and Maintenance Budgets.

Provision of annual operation and maintenance budgets for conduct of research at each Research Center will be the responsibility of PCARR and the Centers which are predominantly colleges of agriculture.

3. Staffing.

The Borrower, through PCARR and the Research Centers, will provide adequate person-power to meet supporting non-professional staff requirements of the Centers for all research, training, monitoring, logistics and outreach activities. PCARR will ensure that sufficient professional personnel are made available for monitoring infrastructure development. PCARR will also ensure that the loan funds provided for technical assistance will be used to make professional personnel available for planning, training, evaluation and special studies associated with development of the Research Centers.

B. It is anticipated that the A.I.D. Loan will provide funding for:

	<u>Estimated Cost</u> ^{1/} (000 US)
Laboratory and field research equipment	2,289.0
Library references, journals and materials	299.0
Training research personnel	2,165.0
In-country academic	(1,196)
International	(343)
Up-grading, refresher courses	(456)
Observational and participation in workshops and conferences	(170)
Technical Assistance	245.0
International consultants	(120)
In-country consultants	(125)
Infrastructure development	5,002.0
Laboratories, experimental fields, drainage, power, water supply, staff houses, green and screen houses	_____
	\$10,000.0

^{1/}10% out/20% in adjustment between line items is permitted without the written modification of this schedule.

1. Laboratory, Field Research Equipment and Library Resources.

To ensure that the Research Centers are adequately equipped, \$2,588,000 (25.9 percent) of the loan fund will be used for procurement of commodities. Commodity requirements were developed by the Borrower and specifications for many of the items are already known. Responsibility for completion of the specifications is that of PCARR in cooperation with the personnel of the Research Centers. Preparation of the IFBs will be that of PCARR with USAID assistance. Procurement will follow guidelines as provided in A.I.D. Handbook 11, Chapter 3. All new procurement should be completed prior to the end of the third year of the project. PCARR will endeavor that wherever practicable U.S. Government owned excess property will be utilized. Loan funds may be used to finance such property.

2. Training.

The number of trained research personnel necessary to staff the Research Centers has been determined by a detailed nationwide person-power survey. To ensure the trained personnel needed,

\$1,539,000 (15.4%) of the loan funds will provide for participant training at the graduate level. The majority (78%) of the training funds will be for training conducted in-country. Seven Ph.D. slots are programmed for training in the U.S. in highly specialized areas that cannot be adequately offered in the Philippines at this time. Additionally, \$455,000 (4.6%) of the loan funds will provide upgrading and refresher courses for intermediate periods of six to twelve months at international research centers and U.S. institutions. The remainder of the training funds, \$170,000 (1.7%) will provide for observational training tours and attendance at international research workshops/conferences.

Recruitment of qualified candidates for the training programs is the responsibility of PCARR in cooperation with the Research Centers.

International training will involve identification and submission of candidates to NEDA who will review and nominate to A.I.D. A.I.D. will review and if approved, the A.I.D. Training Office will assist in preparing documentation and placement as needed. To ensure understanding on the part of both the Borrower and A.I.D., and to expedite the utilization of this component of the loan, a detailed procedural plan should be developed by the Borrower and PCARR.

In-country training will be financed on a Fixed Amount Reimbursement (FAR) basis with reimbursement to be made on a semestral or term basis, whichever may be appropriate.

3. Infrastructure.

To ensure that the Research Centers have sufficient basic infrastructure to operate within a reasonable time frame, \$5,002,000 (50%) of the loan funds will partially fund research laboratories, greenhouses, screenhouses, service and processing structures, experimental farm site development, water supply, sewage, power distribution and staff housing at the Research Centers. The Borrower contribution to infrastructure development will be \$5,849,000.00 or 54% of the total infrastructure costs. Seventeen percent of the infrastructure costs are allocated to staff housing which is considered essential in order to attract and retain an increased and more competent staff at the outlying Research Centers. Another 13.7% is allocated to development of the experimental farm fields to service an increased level of research.

Infrastructure partially financed by loan funds will be financed on a Fixed Amount Reimbursement (FAR) basis. Reimbursement will be made only for completed, accepted structures in operational condition for which prior agreement has been arranged relative to plans, specifications and costs as defined in sub-project agreements. In no case shall reimbursement exceed 75% of the agreed upon costs for infrastructure at the Research Centers.

The infrastructure development schedule calls for completion of that portion to be partially financed from the loan to be completed before the end of the third year with all infrastructure in the project completed by the end of the fifth year. The use of the FAR procedure places responsibility upon the Borrower for providing adequate funding levels during the first two years of the project in order to achieve the scheduled use of loan funds.

4. Technical Assistance.

Assistance in the form of consultants from both off-shore sources and in-country sources will be obtained on an intermittent basis during the life of the project. Consultants will be used to address specific problems in research, research administration, evaluation and conduct of economic-socio investigation relevant to technology transfer to farmers. Assistance will be given to the new outlying centers and cooperation stations in design and implementation of research while permanent staff are being trained. Consultants will be contracted by PCARR and satisfactory contract formats are to be developed as a condition precedent to disbursement. A.I.D. retains approval rights for all contracts and contracting activities will conform to A.I.D. Handbook 11.

Funding of in-country consultants will be on a Fixed Amount Reimbursement (FAR) basis. Reimbursement will be made semi-annually except for consultants contracted for less than six months which will be reimbursed upon submission of vouchers and final report.

C. Evaluation.

In addition to the continuous monitoring and in-country evaluation carried out by Borrower and U.S. personnel, project funds will be used to cover the costs of at least one in-depth evaluation involving external evaluators during the last year of the project. The external evaluation will involve at least one representative of the Borrower outside PCARR, one external research specialist preferably from the U.S. and a third representative from AID/W possessing experience in research. If funding is available, the evaluation team will be expanded to five members representing a wider cross section of research disciplines.

D. End of Project Status.

By the end of the Project, it is planned that the eight Research Centers will be fully organized and have completed the planned

physical facilities; core staff will have completed training; the Centers adequately equipped and conducting research to service regional and national research priorities; a functioning research information retrieval and dissemination system established and servicing the Centers; PCARR fully staffed and operational with increasing effectiveness in maximizing the impact of research on economic growth; research more problem oriented and responsive to problems of small farmers; and closer and more effective interaction of the research and extension services, resulting in more rapid adoption of research findings by farmers.

A detailed description of the planned costs is presented by inputs, in the tables set forth in Attachment 1 to Annex I. The tables depict the estimated costs to the Borrower and disbursements from the Loan for activities under each of the Project inputs. Table 1 is based upon the A.I.D. FY and Table 2 upon the CY which represents the Borrower's FY.

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
AGRICULTURAL RESEARCH II
(In Thousand US\$)

Components	FY 78-79			FY 79-80			FY 80-81			FY 81-82		
	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC
I. Operations	-	-	1,780	-	-	8,224	-	-	5,268	-	-	5,175
II. Infrastructure	-	-	(2,000)*	-	2,000	(3,931)*	-	3,002	3,005	-	-	1,915
III. Equipment	-	-	-	1,251	-	-	1,038	-	-	-	-	-
IV. Library	-	-	-	299	-	-	-	-	-	-	-	-
V. Training												
A. In-country	-	-	-	-	75.8	-	-	309.6	-	-	400.5	-
B. Int'l.	148	-	-	444	-	-	205.3	-	-	150.3	-	-
VI. Technician	5	5	-	15	15	-	73	70	-	22	20	-
Sub-Total	153	5	3,780	2,009	2,090.8	12,155	1,316.3	3,381.6	8,273	172.3	420.5	7,090

Components	FY 82-83			FY 83-84			T O T A L			Overall
	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC	
I. Operations	-	-	5,305	-	-	533	-	-	26,285	26,285
II. Infrastructure	-	-	-	-	-	-	-	5,002	5,849	10,851
III. Equipment	-	-	-	-	-	-	2,289	-	-	2,289
IV. Library	-	-	-	-	-	-	299	-	-	299
V. Training										
A. In-country	-	292.1	-	-	118	-	-	1,196	-	1,196
B. Int'l.	21.4	-	-	-	-	-	969	-	-	969
VI. Technician	5	15	-	-	-	-	120	125	-	245
Sub-Total	26.4	307.1	5,305	-	118	533	3,677	6,323	32,134	42,134

Note: 1. AID-FX costs include an inflation factor of 5%. The GOP remains responsible to accommodate any inflation and contingency factors within local currency costs.

2. U.S. Fiscal Year is October 1 to September 30 of the following year.

*Portion of these GOP-LC expenditures will be reimbursed under Fixed Amount Reimbursement Agreements.

SUMMARY COST ESTIMATE AND FINANCIAL PLAN
AGRICULTURAL RESEARCH II
(In Thousand US\$)

Components	CY 79			CY 80			CY 81			CY 82		
	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC
I. Operations	-	-	3,561	-	-	7,160	-	-	5,057	-	-	5,188
II. Infrastructure	-	-	(2,000)*	-	2,000	(3,931)*	-	3,002	3,005	-	-	1,915
III. Equipment	-	-	-	2,289	-	-	-	-	-	-	-	-
IV. Library	-	-	-	299	-	-	-	-	-	-	-	-
V. Training												
A. In-country	-	77	-	-	309	-	-	400	-	-	292	-
B. Int'l.	329	-	-	368	-	-	168	-	-	104	-	-
VI. Technician	10	10	-	10	10	-	73	70	-	22	20	-
Sub-Total	339	87	5,561	2,966	2,319	11,091	241	3,472	8,062	126	312	7,103

Components	CY 83			T O T A L			Overall
	AID-FX	AID-LC	GOP-LC	AID-FX	AID-LC	GOP-LC	
I. Operations	-	-	5,319	-	-	26,285	26,285
II. Infrastructure	-	-	-	-	5,002	5,849	10,851
III. Equipment	-	-	-	2,289	-	-	2,289
IV. Library	-	-	-	299	-	-	299
V. Training							
A. In-country	-	118	-	-	1,196	-	1,196
B. Int'l.	-	-	-	969	-	-	969
VI. Technician	5	15	-	120	125	-	245
Sub-Total	5	133	5,319	3,677	6,323	32,134	42,134

Note: 1. AID-FX costs include an inflation factor of 6%. The GOP remains responsible to accommodate any inflation and contingency factors within local currency costs.

*Portion of these GOP-LC expenditures will be reimbursed under Fixed Amount Reimbursement Agreements.

ANNEX II - PROJECT LOAN STANDARD

PROVISIONS ANNEX

Definitions: As used in this Annex, the "Agreement" refers to the Project Loan Agreement to which this Annex is attached and of which this Annex forms a part. Terms used in this Annex have the same meaning or reference as in the Agreement.

Article A: Project Implementation Letters.

To assist Borrower in the implementation of the Project, A.I.D., from time to time, will issue Project Implementation Letters that will furnish additional information about matters stated in this Agreement. The parties may also use jointly agreed-upon Project Implementation Letters to confirm and record their mutual understanding on aspects of the implementation of this Agreement. Project Implementation Letters will not be used to amend the text of the Agreement, but can be used to record revisions or exceptions which are permitted by the Agreement, including the revision of elements of the amplified description of the Project in Annex I.

Article B: General Covenants.

Section B.1. Consultation. The Parties will cooperate to assure that the purpose of this Agreement will be accomplished. To this end, the Parties, at the request of either, will exchange views on the progress of the Project, the performance of obligations

under this Agreement, the performance of any consultants, contractors, or suppliers engaged on the Project, and other matters relating to the Project.

Section B.2. Execution of Project. The Borrower will:

(a) Carry out the Project or cause it to be carried out with due diligence and efficiency, in conformity with sound technical, financial, and management practices, and in conformity with those documents, plans, specifications, contracts, schedules, or other arrangements, and with any modifications therein, approved by A.I.D. pursuant to this Agreement; and

(b) Provide qualified and experienced management for, and train such staff as may be appropriate for the maintenance and operation of the Project, and, as applicable for continuing activities, cause the Project to be operated and maintained in such manner as to assure the continuing and successful achievement of the purposes of the Project.

Section B.3. Utilization of Goods and Services.

(a) Any resources financed under the Loan will, unless otherwise agreed in writing by A.I.D., be devoted to the Project until the completion of the Project, and thereafter will be used so as to further the objectives sought in carrying out the Project.

(b) Goods or services financed under the Loan, except as A.I.D. may otherwise agree in writing, will not be used to promote or assist a foreign aid project or activity associated with or financed by a country not included in Code 935 of the A.I.D. Geographic Code Book as in effect at the time of such use.

Section B.4. Taxation.

(a) This Agreement and the Loan will be free from, and the Principal and interest will be paid free from, any taxation or fees imposed under laws in effect in the territory of the Borrower.

(b) To the extent that (1) any contractor, including any consulting firm, any personnel of such contractor financed under the Loan, and any property or transactions relating to such contracts; and (2) any commodity procurement transaction financed under the Loan are not exempt from identifiable taxes, tariffs, duties, or other levies imposed under laws in effect in the territory of the Borrower, the Borrower will, as and to the extent provided in and pursuant to Project Implementation Letters, pay or reimburse the same with funds other than those provided under the Loan.

Section B.5. Reports, Records, Inspections, Audit. The Borrower will:

(a) Furnish A.I.D. such information and reports relating to the Project and to this Agreement as A.I.D. may reasonably request;

(b) Maintain or cause to be maintained, in accordance with generally accepted accounting principles and practices consistently applied, books and records relating to the Project and to this Agreement, adequate to show, without limitation, the receipt and use of goods and services acquired under the Loan. Such books and records will be audited regularly, in accordance with generally accepted auditing standards, and maintained for three years after the date of last disbursement by A.I.D.; such books and records will also be adequate to show the nature and extent of solicitations of prospective

suppliers of goods and services acquired, the basis of award of contracts and orders, and the overall progress of the Project toward completion; and

(c) Afford authorized representatives of a Party the opportunity at all reasonable times to inspect the Project, the utilization of goods and services, financed by such Party, and books, records, and other documents relating to the Project and the Loan.

Section B.6. Completeness of Information. The Borrower confirms:

(a) That the facts and circumstances of which it has informed A.I.D., or caused A.I.D. to be informed, in the course of reaching agreement with A.I.D. on the Loan, are accurate and complete, and include all facts and circumstances that might materially affect the Project and the discharge of responsibilities under this Agreement; and

(b) That it will inform A.I.D. in timely fashion of any subsequent facts and circumstances that might materially affect, or that it is reasonable to believe might so affect, the Project or the discharge of responsibilities under this Agreement.

Section B.7. Other Payments. Borrower affirms that no payments have been or will be received by any official of the Borrower in connection with the procurement of goods or services financed under the Loan except fees, taxes, or similar payments legally established in the country of the Borrower.

Section B.8. Information and Marking. The Borrower will give appropriate publicity to the Loan and the Project as a program to which the United States has contributed, identify the Project site, and mark goods financed by A.I.D., as described in Project Implementation Letters.

Article C: Procurement Provisions.

Section C.1. Special Rules.

(a) The source and origin of ocean and air shipping will be deemed to be the ocean vessel's or aircraft's country of registry at the time of shipment.

(b) Premiums for marine insurance placed in the territory of the Borrower will be deemed an eligible Foreign Exchange Cost, if otherwise eligible under Section C.7(a).

(c) Any motor vehicles financed under the Loan will be of United States manufacture, except as A.I.D. may otherwise agree in writing.

Section C.2. Eligibility Date. No goods or services may be financed under the Loan which are procured pursuant to orders or contracts firmly placed or entered into prior to the date of this Agreement, except as the Parties may otherwise agree in writing.

Section C.3. Plan, Specifications and Contracts. In order for there to be mutual agreement on the following matters, and except as the Parties may otherwise agree in writing:

- (a) The Borrower will furnish to A.I.D. upon preparation:
- (1) any plans, specifications, procurement or construction schedules, contracts, or other documentation relating to goods or services to be financed under the Loan, including documentation relating to the prequalification and selection of contractors and to the solicitation of bids and proposals. Material modifications in such documentation will likewise be furnished A.I.D. on preparation; and

(2) such documentation will also be furnished to A.I.D., upon preparation, relating to any goods or services which, though not financed under the Loan, are deemed by A.I.D. to be of major importance to the Project. Aspects of the Project involving matters under this subsection (a)(2) will be identified in Project Implementation Letters.

(b) Documents related to the prequalification of contractors, and to the solicitation of bids or proposals for goods and services financed under the Loan, will be approved by A.I.D. in writing prior to their issuance, and their terms will include United States standards and measurements;

(c) Contracts and contractors financed under the Loan for engineering and other professional services, for construction services, and for such other services, equipment, or materials as may be specified in Project Implementation Letters, will be approved by A.I.D. in writing prior to execution of the contract. Material modifications in such contracts will also be approved in writing by A.I.D. prior to execution; and

(d) Consulting firms used by the Borrower for the Project but not financed under the Loan, the scope of their services and such of their personnel assigned to the Project as A.I.D. may specify, and construction contractors used by the Borrower for the Project but not financed under the Loan shall be acceptable to A.I.D.

Section C.4. Reasonable Price. No more than reasonable prices will be paid for any goods or services financed, in whole or in part, under the Loan. Such items will be procured on a fair and, to the maximum extent practicable, on a competitive basis.

Section C.5. Notification to Potential Suppliers. To permit all United States firms to have the opportunity to participate in furnishing goods and services to be financed under the Loan, the Borrower will furnish A.I.D. such information with regard thereto, and at such times, as A.I.D. may request in Project Implementation Letters.

Section C.6. Shipping.

(a) Goods which are to be transported to the territory of the Borrower may not be financed under the Loan if transported either:

(1) on an ocean vessel or aircraft under the flag of a country which is not included in A.I.D. Geographic Code 935 as in effect at the time of shipment; or

(2) on an ocean vessel which A.I.D., by written notice to the Borrower has designated as ineligible; or

(3) under an ocean or air charter which has not received prior A.I.D. approval.

(b) Costs of ocean or air transportation (of goods or persons) and related delivery services may not be financed under the Loan, if such goods or persons are carried:

(1) on an ocean vessel under the flag of a country not, at the time of shipment, identified under the paragraph of the Agreement entitled "Procurement Source: Foreign Exchange Costs," without prior written A.I.D. approval; or

(2) on an ocean vessel which A.I.D., by written notice to the Borrower, has designated as ineligible; or

(3) under an ocean vessel or air charter which has not received prior A.I.D. approval.

(c) Unless A.I.D. determines that privately owned United States-flag commercial ocean vessels are not available at fair and reasonable rates for such vessels:

(1) at least fifty percent (50%) of the gross tonnage of all goods (computed separately for dry bulk carriers, dry cargo liners and tankers) financed by A.I.D. which may be transported on ocean vessels will be transported on privately owned United States-flag commercial vessels; and

(2) at least fifty percent (50%) of the gross freight revenue generated by all shipments financed by A.I.D. and transported to the territory of the Borrower on dry cargo liners shall be paid to or for the benefit of privately owned United States-flag commercial vessels. Compliance with the requirements of (1) and (2) of this subsection must be achieved with respect to any cargo transported from U.S. ports and also any cargo transported from non-U.S. ports, computed separately.

Section C.7. Insurance.

(a) Marine insurance on goods financed by A.I.D. which are to be transported to the territory of the Borrower may be financed as a Foreign Exchange Cost under this Agreement provided:

(1) such insurance is placed at the lowest available competitive rate; and

(2) claims thereunder are payable in the currency in which such goods were financed or in any freely convertible currency. If the Borrower (or government of Borrower), by statute, decree, rule, regulation, or practice discriminates with respect to A.I.D.-financed procurement against any marine insurance company authorized to do business in any State of the United States, then all goods shipped to the territory of the Borrower financed by A.I.D. hereunder will be insured against marine risks and such insurance will be placed in the United States with a company or companies authorized to do a marine insurance business in a State of the United States.

(b) Except as A.I.D. may otherwise agree in writing, the Borrower will insure, or cause to be insured, goods financed under the Loan imported for the Project against risks incident to their transit to the point of their use in the Project; such insurance will be issued on terms and conditions consistent with sound commercial practice and will insure the full value of the goods. Any indemnification received by the Borrower under such insurance will be used to replace or repair any material damage or any loss of the goods insured or will be used to reimburse the Borrower for the replacement or

repair of such goods. Any such replacement will be of source and origin of countries listed in A.I.D. Geographic Code 935 as in effect at the time of replacement, and, except as the Parties may agree in writing, will be otherwise subject to the provisions of the Agreement.

Section C.8. U.S. Government-Owned Excess Property. The Borrower agrees that wherever practicable United States Government-owned excess personal property, in lieu of new items financed under the Loan, should be utilized. Funds under the Loan may be used to finance the costs of obtaining such property for the Project.

Article D: Termination; Remedies.

Section D.1. Cancellation by Borrower. The Borrower may, by giving A.I.D. 30 days written notice, cancel any part of the Loan which has not been disbursed or committed for disbursement to third parties.

Section D.2. Events of Default; Acceleration. It will be an "Event of Default" if Borrower shall have failed:

- (a) To pay when due any interest or installment of Principal required under this Agreement; or
- (b) To comply with any other provisions of this Agreement; or
- (c) To pay when due any interest or installment of Principal or other payment required under any other loan, guaranty or other agreement between the Borrower or any of its agencies and A.I.D. or any of its predecessor agencies.

If an Event of Default shall have occurred, then A.I.D. may give the Borrower notice that all or any part of the unpaid Principal will be due and payable sixty (60) days thereafter, and, unless such Event of Default is cured within that time:

(1) such unrepaid Principal and accrued interest hereunder will be due and payable immediately; and

(2) the amount of any further disbursements made pursuant to then outstanding commitments to third parties or otherwise will become due and payable as soon as made.

Section D.3. Suspension. If at any time:

(a) An Event of Default has occurred; or

(b) An event occurs that A.I.D. determines to be an extraordinary situation that makes it improbable either that the purpose of the Loan will be attained or that the Borrower will be able to perform its obligations under this Agreement; or

(c) Any disbursement by A.I.D. would be in violation of the legislation governing A.I.D.; or

(d) The Borrower shall have failed to pay when due any interest, installment of principal or other payment required under any other loan, guaranty, or other agreement between the Borrower or any of its agencies and the Government of the United States or any of its agencies;

Then A.I.D. may:

(1) suspend or cancel outstanding commitment documents to the extent they have not been utilized through irrevocable commitments to third parties or otherwise, giving prompt notice thereof to the Borrower;

(2) decline to issue additional commitment documents or to make disbursements other than under existing ones; and

(3) at A.I.D.'s expense, direct that title to goods financed under the Loan be transferred to A.I.D. if the goods are from a source outside Borrower's country, are in a deliverable state and have not been off-loaded in ports of entry of Borrower's country. Any disbursement made under the Loan with respect to such transferred goods will be deducted from Principal.

Section D.4. Cancellation by A.I.D. If, within sixty (60) days from the date of any suspension of disbursements pursuant to Section D.3, the cause or causes thereof have not been corrected, A.I.D. may cancel any part of the Loan that is not then disbursed or irrevocably committed to third parties.

Section D.5. Continued Effectiveness of Agreement. Notwithstanding any cancellation, suspension of disbursements, or acceleration of repayment, the provisions of this Agreement will continue in effect until the payment in full of all Principal and accrued interest hereunder.

Section D.6. Refunds.

(a) In the case of any disbursement which is not supported by valid documentation in accordance with this Agreement, or which was for goods or services not used in accordance with this Agreement, A.I.D., notwithstanding the availability or exercise of any other remedies provided for under this Agreement, may require the Borrower to refund the amount of such disbursements in United States Dollars to A.I.D. within sixty (60) days after receipt of a request therefor.

The right to require such a refund of a disbursement will continue, notwithstanding any other provisions of this Agreement, for three (3) years from the date of the last disbursement under this Agreement.

(b)

(1) any refund under the preceding subsection, or

(2) any refund to A.I.D. from a contractor, supplier, bank, or other third party with respect to goods or services financed under the Loan, which refund relates to an unreasonable price for or erroneous invoicing of goods or services, or to goods that did not conform to specifications, or to services that were inadequate, will:

A. be made available first for the cost of goods and services required for the Project, to the extent Justified; and

B. the remainder, if any, will be applied to the installments of Principal in the inverse order of their maturity and the amount of the Loan reduced by the amount of such remainder.

Section D.7. Nonwaiver of Remedies. No delay in exercising any right or remedy accruing to a Party in connection with its financing under this Agreement will be construed as a waiver of such right or remedy.