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PROJECT PAPER

PHILIPPINES

AGRICULTURE RESEARCH LOAN

PROPOSAL

UNITED STATES

AGENCY FOR INTERNATIONAL DEVELOPMENT

MANILA, PHILIPPINES

BEST AVAILABLE

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PROJECT PAPER

PHILIPPINE AGRICULTURE RESEARCH LOAN

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PROJECT PAPER

PHILIPPINES ---- AGRICULTURE RESEARCH LOAN

PART I

A. Summary

To develop and improve the research capability of the Government of the Philippines (GOP), the proposed loan provides for additional facilities and equipment for four research centers plus the development of the required manpower. The contribution of AID resources through the Philippine Council for Agricultural Research (PCAR) will strengthen direction, coordination, programming and management of research. The strengthening of the institutional capability made possible by this project will greatly enhance the ability of the GOP to focus on the development and dissemination of improved production technology and corresponding improvements in services to the small farmer, making it possible for more widespread use of production increasing practices.

The proposed project will provide partial financing for the development of a research capability at four research centers: (1) the La Granja Research Center in Negros Occidental, the principal center for research on soybeans and other legume seed crops; (2) the Southern Mindanao Agriculture Research Center, the principal center for research on corn and sorghum; (3) the Bicol Research Center consisting of the Bicol Rice and Corn Station and the Camarines Sur College of Agriculture at Pili and the Bicol University College of Agriculture at Guinobatan; and (4) the Central Luzon Research Center comprised of the Maligaya Rice Experimental Stations and the College of Agriculture Research Center of the Central Luzon State University.

While the project is essentially an institution building project, it is expected that research results applicable to the problems of small farmers will accrue during the project span. Immediate benefits will be measurable in terms of improved capability to conduct research, i.e., research centers with basic infrastructure, adequately equipped for the research mission and staffed with individuals capable of planning and conducting research who are able to translate the results into a form usable by agents of extension, supervised credit, agrarian reform, and cooperatives in assisting the small farmer improve his productivity. On the longer term basis the benefits will be measurable in terms of new or improved technology - new varieties, disease, insect, weed and pest control practices, soil fertility, water management practices and cropping systems -- adapted to the small

farmer needs. Thus, not only increasing total production of food and feed grains and legume-seed crops but increasing the productivity of the small farmer as a means of improving his income.

B. Recommendation

The Government of the Philippines urgently requests this loan, and has the administrative, fiscal and technical management capability to implement the project. It is, therefore, recommended that the loan be approved for implementation in FY 1975.

C. Project Development

1. Loan Committee

Dr. Frank W. Sheppard, Jr. Assistant Director for Agricultural Development	Mr. Willy D. Baum Assistant Program Officer
Mr. Donald R. Mitchell Deputy Assistant Director for Agricultural Development	Dr. Francis LeBeau Agricultural Research Consultant
Mr. Thomas E. Johnson Deputy Assistant Director for Capital Development	Dr. James W. Cobble Research Consultant and former Dean of College of Agriculture, University of Rhode Island

2. Borrower: Government of the Republic of the Philippines (GOP)

3. Implementing Agency: The Philippine Council for Agricultural Research (PCAR)

4. Loan

a. Total Project Cost (See Tables 1 and 2)

b. Amount of AID Assistance

(1)	Foreign Exchange	$ 2,320,000
(2)	Local Cost Component	2,680,000

(3) Proposed Terms -

AID's standard terms for Development Loans, i.e., repayment within 40 years including a 10-year grace period, with interest at 2% during the grace period and 3% thereafter.

TABLE 1

Project Cost Summary
Four Agriculture Research Centers

	Total Cost of Project ($000)						US Contribution	
	1975-76	1976-77	1977-78	1978-79	1979-80	Total	Total	As % of Total
Operations including professional salaries	1,440	2,104	2,530	2,655	2,770	11,499	0	0
Training including academic and short term within country and externally	200	450	450	450	344	1,894	1,000	52
Library - books, periodicals, journals, materials, etc.	50 1/	150 1/	50 1/			250 1/	250 1/	100 1/
Infrastructure - buildings, housing, utilities and land development	760	2,000	2,240	2,000	1,670	8,670	2,240	26
Equipment and machinery for laboratories and farms	600	800	400	87	50	1,937	1,160	60
Technical Advisory services	40	68	95	65	35	303	303	100
Total including operations cost	3,090	5,572	5,765	5,257	4,869	24,553	4,953	20
Total excluding operations cost	1,650	3,468	3,235	2,602	2,099	13,054	5,000 2/	38

1/ Requirements for library not separately budgeted by GOP but included in operations budget. The figure included here reflects a need for offshore procurement to strengthen libraries.

2/ Rounded.

TABLE 2

Summary of U.S. Contribution to Agriculture Research Project ($000)

	1975-76	1976-77	1977-78	1978-79	1979-80	Total	Local Currency Cost	Foreign Exchange Cost
I. Technical Advisor								
Short term	40	68	95	65	35	303		350
II. Training and Manpower Development								
Academic for PhD (1)	46	90	125	80	39	380		
Academic for M.S. (2)	35	76	77	77	35	300		
Upgrading Refreshers (3)	20	40	60	60	20	200		
Participation in scientific conferences and short term observation (4)	20	30	30	20	20	120		
Sub-Total	121	236	292	237	114	1000	440	560
III. Library - Books, Journals, Films, Materials, etc.	50	150	50	-	-	250		250
IV. Infrastructure - Buildings, Utilities and Land Development	140	1000	1100	-	-	2240	2240	
V. Research Equipment and Farm Equipment and Machinery and Vehicles	250	600	310	-	-	1160		1160
GRAND TOTAL	601	2054	1847	302	149	5000 (5)	2680	2320

(1) A total of 38 with 30 in local institutions and 8 in U.S. institutions.
(2) A total of 100 in local institutions.
(3) 20 trainees for 9-12 months each in U.S. or third country.
(4) 60 trainees for 3-6 weeks each in U.S. or third country.
(5) Rounded.

c. Borrower's Contribution $ 24,600,000

d. Other Donor Input None

5. Description and Justification of Project

The Small Farmer is the basic producer of the food and feed grains needed for his own use as well as for sale in the market place. As a national average, rice and corn are produced on holdings of 2.5 to 3.0 hectares by a farm family earning ₱2,463 ($350) at 1971 prices. These same families grow sorghum, soybeans and other legume seed crops.

Sixty percent of the food energy consumed by the average Filipino is made up of food grains. In the case of low income people, that figure exceeds 75 percent. The average Filipino daily consumes 15 percent less food energy than recommended and there is evidence that in many pre-school children this deficit may be as great as 30 percent. Thus, a great many small farmers are providing two thirds of the diet of most Filipinos but production is inadequate to provide proper nutrition. By the year 2000, it is estimated the population will double, exceeding 80 million. This means that agricultural production must also double to meet the food need. Since most of the arable land is now under cultivation, it is obvious that increased production must result from better management of resources at the farm level. Agriculture research is essential if food production is to be doubled in the Philippines over the next 25 years.

The linkage between the producer and the researcher is a complex relationship with many intermediaries in this two-way communications system. For research to be relevant, it must meet the needs of the farmer at the appropriate time. On the other hand, the research worker must not only be aware of the farmers current problems, but must also anticipate and conduct research on problems that may be important in the future. For example, disease and pest resistance in high yielding varieties are characteristics that can significantly increase production in areas where the malady is prevalent. It takes several years to develop these resistant varieties, therefore the researcher must identify these characteristics in advance and if possible, have the new seeds in reserve. Once identified, a strain of resistance will not necessarily remain constant so additional work must be done to alter or improve the resistance. In effect, a good research program will have a stream of new technology available so that the small farmer is provided with management alternatives that he can use to increase his income.

To effect this two-way communication system, PCAR coordinates those responsible for research activities, the private sector and those who work directly with small

farmers. As a direct channel of communications, between researchers and small farmers, farmer training meetings, field days and private visits to research stations as well as researchers' participation in field trials and farmer meetings provide opportunity for exchange of ideas.

The development of four research centers under this proposed loan will decentralize current research efforts concentrated primarily in the Los Banos area and will strengthen the research capability in the regions where the stations are located. In this way, research will be done in areas where the crop is important, nearer the targeted small farmers and at the lowest level possible consistent with effective research administration.

It is important to note that at the end of the project period (1980) the manpower, infrastructure and commodities will be in place to do the research work. The results of research from this loan cannot be expected to be immediately available. However, the research capability will be in place to make a significant contribution during the 1980s.

While the small farmer is the ultimate target for the research technology, an essential intermediate step is the development of an ability to coordinate a wide range of research activities and facilitate communication between the researcher and the end user. The development of the research facilities and upgrading personnel are important steps in developing and disseminating new technology. PCAR has demonstrated an administrative capability, as described in other sections of this paper, for coordinating the agricultural research resources of the GOP. The strengthening of PCAR through the loan, is secondary to the development of the four research centers, but is essential if the stream of information and improved technology needed to increase production is to reach the small farmers.

The GOP is very much concerned with food production as indicated by policies and action programs now underway. Credit is being extended at unprecedented levels through the banking system (currently over 200 million dollars is on loan to small farmers through the Masagana programs). Price supports are being administered for rice and corn to encourage production. An agrarian reform program is underway dividing rice and corn holding over 7 hectares among tenant farmers. The Mission feels that the GOP will continue to provide the policy and administrative structure framework that will encourage increased production by the small farmer (See Logical Framework Matrix, Annex C.)

In conclusion, the Mission would like to emphasize that an overwhelming majority of the rice and corn farmers are small farmers. Experience has shown, through Masagana 99 and other government sponsored programs that new rice varieties have spread very rapidly, (enough IR-26 seed was available within 15 months to plant 1974-75 dry season crop of 500,000 has.) Currently 50-60% of the rice produce in the Philippines is from high yielding varieties.

Research priorities will be based on specific constraints to rice and corn production and research field trials will be conducted in close harmony with extension personnel.

PART II

A. Project Background

1. History and Development

Faced with a rapidly increasing population and inadequate supplies of basic food and feed grains, the Philippines is seriously concerned about increasing its food production. With an annual growth rate of about three percent, the population of the Philippines increased from 27 million in 1960 to about 43 million in 1974. Without any substantial change in the growth rate, the population is expected to reach 50 million by 1980. This rapid population growth will present serious problems in meeting food requirements unless measures are taken to reduce the rate of growth and increase food production. The USAID Family Planning project working in conjunction with the GOP Population Commission is attempting to reduce the rate of population growth. This loan proposal will enhance Philippine capability to provide farmers with the technology needed for increased agriculture production.

The importance of agricultural development in the economic growth of the Philippines cannot overemphasized. Almost one-third of the national income originating from agriculture, fisheries and forestry; approximately 70 percent of the population lives in rural areas; more than one-half of the labor force is employed in agriculture; and about 60 percent of the foreign exchange earnings come from agricultural exports. Consequently, improvements in agricultural productivity will contribute to economic growth through higher production within agriculture, provide adequate food supplies for the masses and raw materials for industry. Through a dynamic agricultural sector, it will be possible to expand exports, increase foreign exchange revenue and provide a major source of gainful employment for the labor force.

Rice and corn are the major staple food crops in the Philippines. Over the years these crops have come from both domestic production and imports. Rice is grown primarily under irrigation or rainfed paddy culture (80% lowland and 20% upland with about two-thirds of the lowland area being rainfed) and corn more generally under upland conditions.

The long term trends in national production shows an increase of 2.9 percent per year from 1911 to 1964 for rice and 3.1 percent for corn. Increase during this period were due mostly to expansion in the area of land under cultivation.

With the introduction of high yielding varieties and infrastructure development (especially irrigation) rice production and yield has increased substantially from the 1965 national average of 1.25 M.T./ha to the 1970 level of 1.68 M.T./ha. (See Table 3). Although the trends in productivity have been encouraging in recent years, when international comparisons are made, it is clear that yield per hectare is much lower than other countries in Southeast Asia (Table 4) With the declining availability of new lands to bring under cultivation and the increasing costs of developing such lands, the prospect for rapid growth in Philippine agriculture must depend more on new and modern technology plus modern inputs rather than on the traditional inputs of land and labor.

2. Host Country Objectives

The principal objectives of the Government of the Philippines 1974-77 Four-Year Development Program for the agricultural sector have been defined as follows:

1) Increased food production so as to achieve self-sufficiency in the basic plant foods -- rice and corn and also livestock and fish product.

2) Acceleration of the agrarian reform program of land transfer and distribution and expansion of services to new landowners.

3) Expansion of exports and import substitution.

4) Conservation and development of forestry resources.

Implicit in these objectives and more explicitly in the agricultural strategy statements, is the growing realization of the need to focus attention on assistance on the masses of small rice and corn farmers who make up approximately 70 percent of the 6.2 million farm people. Over 80 percent of the operating farms is limited to one to five hectares of land. It is further acknowledged that development of other sectors of the national economy depend upon increasing income of the rural masses.

With production per hectare for corn and rice in the Philippines much below the average for several comparable Asian countries, the prospects for rapid growth in productivity and assistance to the small farmer depends greatly upon new and applicable technology plus modern type inputs rather than on the traditional input of land and labor. In a recent GOP

TABLE 3

Past Trends in Production, Yield and Projected Increase Needed to Sustain a Per Capita Production of 135 kilograms Palay Assuming Approximately 3 Million Hectares

Year	Population x 1000	Percent Change	Production x 1000 MT	Percent Change	Yield MT/Ha	Percent Change	Production/Capita Kgs/ha
1955	23,550		3202.9		1.21		138
		17		3.14		1.48	
1960	27,500		3739.5		1.13		138
		17		1.32		2.04	
1965	31,600		3992.5		1.25		127
		17		5.27		6.09	
1970	36,684		5233.4		1.68		143
		34		27.00		32.00	
1980	49,304		6656.0		2.22		135
		34		34.00		34.00	
1990	66,252		8994.0		2.98		135

Source: First National Agricultural Systems Research Congress Crop Research Division Workshop Session No. 8 - Rice UPLB February 2-17, 1973.

TABLE 4

Yields in Metric Tons Per Hectare
in Selected Countries

	Year	Philip-pines	Thai-land	Indo-nesia	Malay-sia	Japan	U.S.A.
Rice	1971	1.57	1.99	2.41	2.91	5.24	5.30
	1972	1.49	1.81	2.44	2.90	5.85	5.25
Corn	1971	0.83	2.26	1.00	2.16	2.50	5.53
	1972	0.79	1.32	1.00	2.12	2.90	6.08

Source: FAO, Production Yearbook, 1972.

report,[1/] recognition was given to the fact that growth in agricultural production in the past has been mainly due to expanded use of formerly new or uncultivated lands while it is, of course, limited in application. This practice follows the traditional pattern of growth in Southeast Asia. Greater and more intensive use of the small farm operation is paramount to the increase of returns for the farm family.[2/] To bring new technology to the small farmer, a considerably strengthened research establishment as well as extension services will be required. Research has made gains in the development of high yielding varieties of rice and downy mildew resistant varieties of corn, but the technical base for these crops as well as for sorghum and soybeans must be expanded.

To develop a substantial and sustained rate of growth new technology must be generated and applied. Therefore, the future agricultural growth rests heavily on building strong research programs that will continually supply the needed technology for expanding and diversifying agricultural output.

3. A Research System Needed

Aware of the need for a better research capability to support the objectives of a more dynamic agricultural sector, President Marcos in February 1971, created an executive panel to "Develop a National Agricultural Research System". This panel composed of high level individuals from the various branches of the government and universities immediately undertook an exhaustive study of the research system--physical facilities, equipment, manpower, programs, projects, etc. At the same time, a study of the research systems of other countries was undertaken by members of the panel.

AID, the Ford Foundation, the Agricultural Development Council and the National Food and Agriculture Council provided financial support for the work of the panel as well as help in analyzing the panel's findings and is developing recommendations through the services of the high level consultants.

1/ ILO Sharing in Development--A Program of Employment Equity and Growth for the Philippines. Prepared by the National Economic and Development Authority, Republic of the Philippines, 1974.

2/ Agricultural Sector Survey--Philippines (4 volumes); Vol. I, The General Report, Document of IBRD, May 2, 1973.

The findings and recommendations of the panel were presented in six volumes between 1971 and late 1972. Among the more significant findings were:

(1) Although a substantial amount of funds was being allocated by government for agricultural research, the useful research output was limited and was having little impact on the agriculture sector.

(2) There was inadequate planning and coordination at the national level. Research projects and programs were not necessarily related to national goals nor to plans for agricultural development.

(3) Research resources were highly fragmented as were the allocation of budgets. Funds were allocated to large numbers of discrete, unrelated and frequently overlapping activities. There was also a substantial diversion of appropriated funds to uses other than for the support of research for which they were budgeted, and

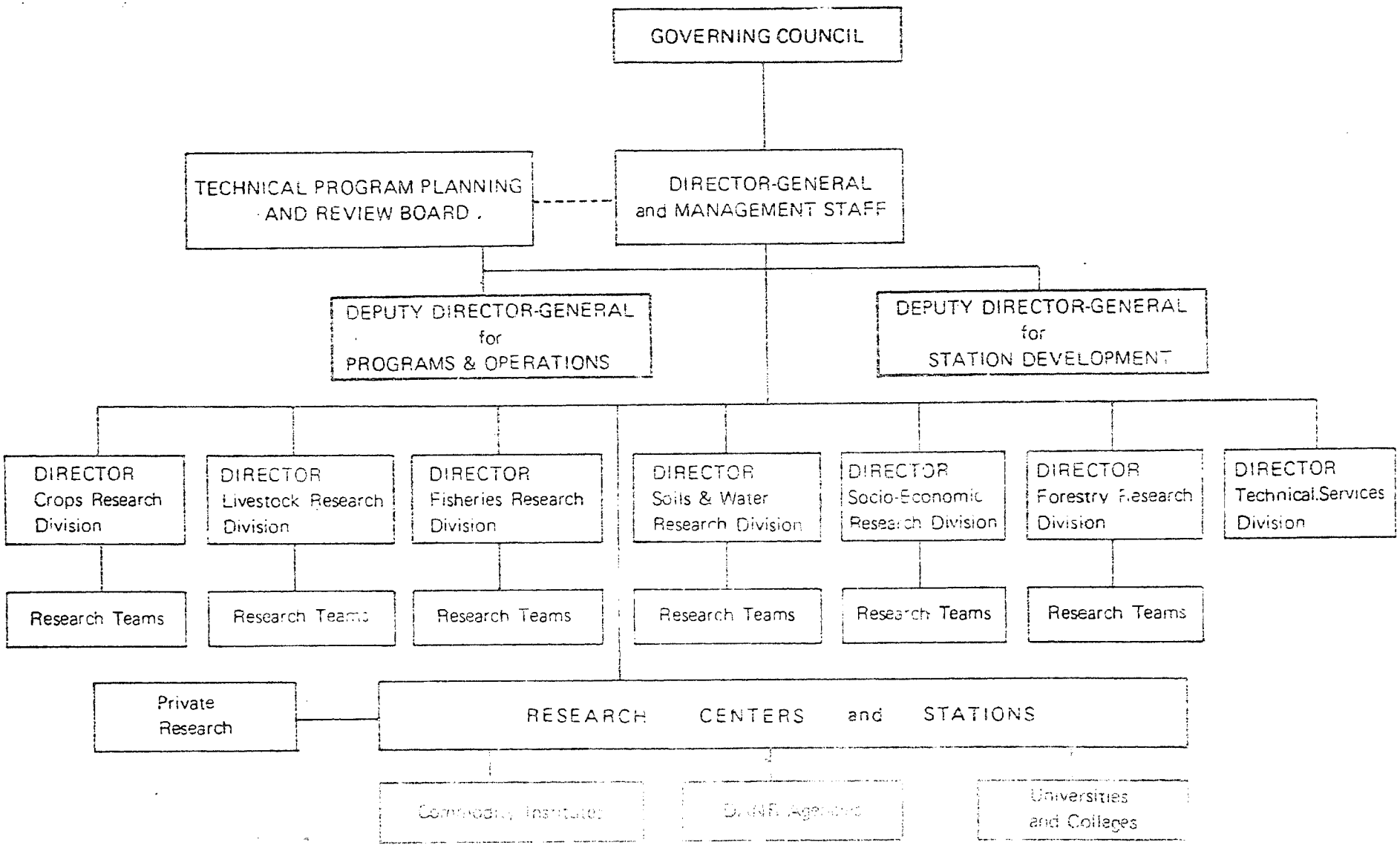
(4) Research was highly personalized in that activities were undertaken in accordance with the individual's personal interest rather than in support of planned programs designed to further national development.

4. Philippine Council for Agricultural Research (PCAR)

Against the background of findings, the Executive Panel, empowered to develop a national agricultural research system, recommended that a special body, the Philippine Council for Agricultural Research (PCAR), be established to give direction to and to coordinate research activities of government agencies and agricultural colleges and universities. This body was created by Presidential Decree #48 dated November 10, 1972. PCAR was established as an autonomous body attached to the Department of Agriculture for administrative purposes and responsible to a "Governing Council". See Figure 1 for detailed organizational structure of PCAR.

Figure 1

ORGANIZATIONAL STRUCTURE OF THE PHILIPPINE COUNCIL FOR AGRICULTURAL RESEARCH (PCAR)



The Council has the following membership:

Chairman	-	Chairman of the National Science Development Board (NSDB)
Vice-Chairman	-	Secretary of Agriculture
Member	-	Secretary of Natural Resources
Member	-	Budget Commissioner
Member	-	Representative, National Economic and Development Authority (NEDA)
Member	-	President, Association of Colleges of Agriculture in the Philippines (ACAP)
Member	-	Chancellor, University of the Philippines at Los Banos
Member	-	Outstanding Leader of Agricultural Business

The governing council makes policies and provides guidelines for implementation by the PCAR Secretariat. The Secretariat is composed of the Director-General, a Deputy Director-General for programs and Operations, a Deputy Director-General for Station Development, management staff, six research directors and a director for technical services. They collectively work for the implementation of the policies and guidelines set by the Council toward fulfillment of the national goals for agricultural progress.

The research directors, one each for crops, livestock, fisheries, forestry, soil and water, and the socio-economics research division, program the research projects and works with twenty-nine commodity teams broken down as follows:

Crops	-	16	Livestock	-	4
Fisheries	-	2	Soil & Water	-	2
Forestry	-	3	Socio-Economics	-	2

Each research team is composed of scientists with specialization in the different aspects of each commodity. For example, the National Corn Research Team consists of a plant breeder, soil specialist, agronomist, entomologist, plant pathologist, agricultural engineer, a rural sociologist, a cereal processing specialist, agricultural economist, etc.

Among other functions, the research directors conduct periodic assessments of approved and on-going research projects and straighten out problems related to the process of implementating the National Agricultural Research Program. They also handle the readjustments in the allocation of staff and other resources when needed.

The director for technical services, aside from handling the public relation needs of PCAR, helps the research division in their outreach program.

The body to review the research programs of the different research division, the Technical Program Planning and Review Board (TPPRB), has the following membership:

Chairman	-	Director General, PCAR
Vice-Chairman	-	Executive Director, National Food and Agriculture Council
Member	-	Director, Agro-Industrial Projects Department, Board of Investment
Member	-	Representative, National Economic and Development Authority
Member	-	Chief, Planning Service, National Science Development Board
Member	-	Chairman, Agriculture and Forestry Division, National Research Council of the Philippines
Member	-	Chief, Plans and Programs Services, Department of Agriculture
Member	-	Chief, Plans and Programs Services, Department of Natural Resources
Member	-	Chief, Plans and Programs Services, Department of Agrarian Reform
Member	-	Executive Director, Nutrition Council of the Philippines
Member	-	Representative of the Budget Commission
Members	-	Three Research Directors from Colleges and Universities
Members	-	Three Representatives, Agri-Business
Ex-Officio-Secretary	-	PCAR Deputy Director-General-Programs and Operations

The PCAR-TPPRB also insures the coming together of expertise between the private sector and top government policy makers. This is vital in the establishment of a national agricultural research program.

During an existence of slightly over 18 months, PCAR has marked up an impressive record of accomplishments and has emerged as the GOP instrument for providing direction, effecting coordination and controlling the allocation of public funds in support of agricultural research[1/]. In a recent paper presented by the Director-General of PCAR, a two-year history, development and accomplishments were reviewed (copy available in AID/W).

A detailed record of PCAR's first 18 months is set forth in a July 1974 report of Dr. A. H. Moseman, Rockefeller Foundation Consultant and recognized authority on organization and administration of agricultural research (copy available in AID/W). Several compilations by the PCAR Secretariat provide in still greater detail a record of PCAR's accomplishments. A listing of the principal documents and accomplishments is as follows:

a. Research in agriculture, forestry and fisheries. A listing of on-going projects as of August, 1974.

b. Total requirements for the full development of Philippine agricultural research capability - an inventory of infrastructure, materials, equipment, research manpower and research operating funds with projections of additional needs during the period of 1974-75 to 1981-82 including estimation of financial requirements.

c. Individual reports by the 29 commodity-discipline task forces setting forth the state of the art and research objectives, listing on-going projects for each, and identifying important gaps.

d. A special research project on administration of research which was completed in 1974 as a joint undertaking of SEARCA (Southeast Asia Regional Center for Agriculture) and the UPLB (University of the Philippines at Los Banos).

e. Organization of the first Agriculture Systems Research Congress of February 1973 at which was formulated a broad framework for agricultural research in keeping with national development priorities and plans.

1/ The First Two Years of PCAR, delivered by Dr. Joseph Madamba at the Second Anniversary Symposium, UPLB Campus, Los Banos, Laguna.

f. Development of a system for research project reporting and evaluation which is to enter the implementation phase in November-December 1974.

g. Agricultural research thrusts in the Philippines for the 1970s. (Priority areas for each of the 14 research centers and 50 testing/cooperating stations.)

h. Manpower resources in Philippine agriculture, fisheries, and forestry research, 1973-1974.

i. Development of formal memoranda of understanding to govern cooperative relationships with the International Research Centers (International Rice Research Institute and Asian Vegetable Research and Development Center). Similar agreements have been developed with CIMMYT (Centro Internacional de Mejoramiento de Maiz y Trigo) and ICRISAT (International Center for Research in Semi-Arid Tropics) the Malaysian Rubber Institute and with local commodity and private research institutes.

j. Organization of training programs on research station operations and administration of water management research, and on design and analysis of experiments.

k. Development of an outreach program for agricultural research in the Philippines which includes the following basic components: scientific literature review, subject matter specialist corps, Philippine Recommendation Series, media service and linkage conferences with extension and media.

With a solid foundation thus established for effective implementation of a research program geared to support the three main thrusts of the GOP Agriculture Programs - increase in food production, improvement of small farmer incomes and increases in earnings from agriculture exports, NEDA requested in July 1974 that AID study the feasibility of extending a loan to support the research effort. In late September 1974, a team of two consultants arrived in the Philippines to assess the feasibility of the GOP request and to assist in the development of a project.

5. The Philippine Government Program for Improvement of Agricultural Research

The Government of the Philippines (GOP) through the efforts of PCAR has made substantial progress toward defining research objectives and priorities within the context of the GOP 1974-77 development plan in general and more specifically the plan for the agricultural sector. Most irrelevant activities have been terminated and a beginning has been made in the consolidation and rearrangement of highly fragmented activ ities into well rounded and balanced programs having a direct bearing on development programs of the country.

a. Agricultural Research Network

Through a national network of agricultural research centers and experiment stations, PCAR hopes to carry out impact projects and problem oriented research to provide immediate and relevant solutions to agricultural problems in the various regions. See Figure 2 for the locations of the country-wide research systems. Annex H provides the names and location, main commodity stations and the cooperating stations for various commodities of the national network.

b. Seven Year Research Program

A program for development of research capabilities and for implementation of research over a seven year period has been developed. This plan entails capital investment for improvements and additions to infrastructure, for laboratory equipment, library materials, farm equipment and for manpower development totalling approximately $33 million. The corresponding projected outlay for recurring expenses for personnel and for operations is $106 million. (See Table 5) Approximately 60% of the recurring budget is for operating expenses with the remaining 40% for personnel services.

By comparison, in 1970 the total expenditure of public funds for agricultural research was slightly under $10 million. The 1974-75 budget is $10.7 million for operating expenses and capital investment.

c. Manpower Development

A successful research program in agriculture, forestry and fisheries, regardless of the monies available for operations, facilities, infrastructure, etc., depends to a large extent on the capability of the research manpower. The total

Figure 2

PCAR NETWORK OF AGRICULTURAL RESEARCH CENTERS AND COOPERATING STATIONS

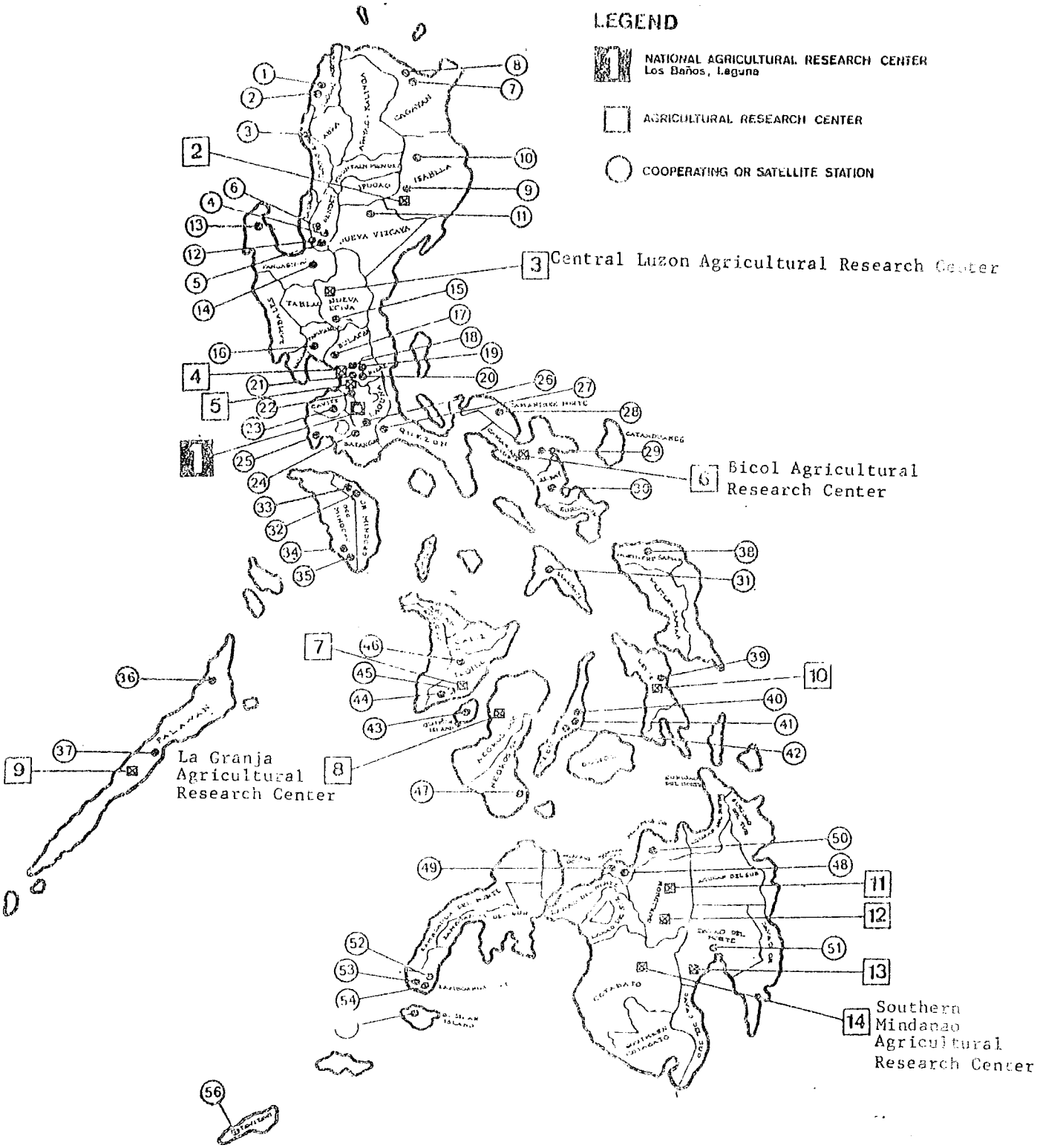


TABLE 5

Summary of Total Financial Requirement for the Full Development of the Philippine Agricultural Research Capability (7 years)

In Million Pesos

Year	Infra-structure	Lab & Field Equipment	Personal Services	Operating Costs	Manpower Development	Invitational Travel	Research Adminis-tration	Total
1975-76	9.000	21.514	28.098	47.550	0.670	0.644	2.000	109.581
1976-77	16.000	8.631	32.968	53.823	1.490	0.798	2.400	118.115
1977-78	30.000	8.631	37.630	61.240	2.060	1.001	2.800	143.362
1978-79	34.000	4.312	40.135	64.281	2.630	1.015	3.300	149.673
1979-80	30.000	-	41.433	65.746	3.230	1.001	3.900	145.310
1980-81	20.000	-	44.781	71.412	3.520	0.966	4.600	145.279
1981-82	12.053	-	50.136	30.450	16.250*	0.959	5.000	164.848
Total Pesos	151.053	43.148	275.181	446.507	29.850	6.384	24.000	976.123
Total (U.S. Dollar) Millions	($21.579)	($6.164)	($39.286)	($63.786)	($4.435)	($0.912)	($3.43)	($139.446)

* Includes 8,9,10 years for manpower training.

7 Pesos = $1.00

manpower training requirement for the PCAR research network in the next ten years is approximately 400 PhD and 900 MS scholars for research and other duties. A survey taken in 1973 by PCAR of government and private agencies involved in agricultural research shows a total of 2,213 research workers (1097 SMY). Forty percent of the workers is in the universities and colleges and 30% in the Department of Agriculture and Natural Resources Agencies. The remainder is in private industries, institutes and other government entities. The lower SMY figures for research results, chiefly from the high percentage of people in colleges and universities where teaching has the highest priority (2213 research workers).

Table 6
Five Year Project for Manpower Training (1973-78)

	Actual 1973	5 yrs. Expected to Complete	Less Est. Retirement Deaths	Est. Number 1978	% Charge in Adv Degree Holders 1973	1978
Ph. D	246	102	4	344	11.1%	14.9%
M.S.	520	232	39	713	23.5%	31.0%
B.S.	1,447	84	294	1,237	65.4%	54.1%
Total	2,213	418	337	2,294		

As expected Table 6 shows that increasing the number of highly trained staff members within a unit or system is rather slow due to several factors including length of training, retirements, deaths. It is, however, rather clear that a well organized plan for upgrading the capabilities of a research staff can make substantial progress even in a five year period. The survey noted that researchers from the college/university sector have been most productive in terms of volume and quality of research output although only 24 percent of their time is devoted to research. Approximately 70 percent of the current research staff holding M.S. or Ph.D degrees is concentrated in these institutions. Starting in 1973-74, PCAR has sponsored 28 scholars for M.S. degrees and 12 for Ph.D. in Agriculture at the University of the Philippines Los Banos, 2 M.S. scholars at UP-College of Business and 2 M.S. and 15 B.S. students at the UP-College of Fisheries. As of November, 1974, the total number is 59.

The program of investment, broadly outlined in previously presented Table 5, is phased over time as to content and emphasis. Although the GOP program covers a seven year time span, this AID project will be limited to no more than three years except in the case of training which is planned to extend over a five year period.

Initially, the focus will rest heavily on food and grain crops, fisheries and export crops. The GOP has requested AID assistance for expansion and improvement of research capability particularly in the food and feed crop sector. The commodity institutes are supported by a special levy on exports which will continue to provide the principal input for research related to exports. External assistances principally from Japan, UNDP and one USAID technical project will provide the necessary support for research in fisheries.

d. Outreach Program for PCAR

The main objective of this project is to strengthen the research capability of agricultural research technicians in the Philippines and the establishment of a central repository of agricultural literature. Some of the activities include:

(1) Scientific Literature Service (SLS) for Colleges, Experiment Stations and Research Centers

These units will be furnished by SLS "Content" pages from journals. Researchers can select articles in their field of interest and PCAR will provide a copy of the complete scientific article.

(2) Subject Matter Specialists

This group is new to PCAR and they will be stationed at Research Centers and Stations to provide a vital link between research and information users (policy makers, planners, extension agents, farmers, etc.)

(3) Philippine Recommends Series

This is a semi-technical guide containing the latest developments and/or technology in each 20 different commodities under the PCAR network.

(4) Media Service

This include the publication of an information sheet from PCAR, press releases to 128 newspapers, magazines, etc., Radio/TV releases to 163 stations, and PCAR farm news through [illegible] and T.V.

(5) Linkage, Conferences with Other Agencies

These are workshop/conferences in agriculture including extension, instruction, mass media, policy makers, etc.

e. Memorandum of Agreement Program of PCAR

PCAR, in a determined effort to assist and to receive assistance from many GOP agencies as well as international research units in pursuing a most progressive and energetic approach to Philippine Agricultural Research Problem, has entered into Memorandum of Agreement with a number of agencies. These agreements cover working arrangements, mutual/joint cooperative efforts, joint library use, establish weather stations, research data exchange, graduate fellowship programs, etc. Annex J lists the institution/agencies and a brief objective of the several agreements now in effect plus several now being negotiated.

6. <u>The Four Agricultural Research Centers Selected from the PCAR Network for Possible Assistance</u>

The four centers chosen for support under this loan constitute the more important centers (excluding the Los Banos Center which is by far the largest, the best equipped and the most comprehensive in scope) in the research network. Moreover, they are the principal centers for research on the basic food and feed crops and consequently will be dealing directly with commodities which are of interest to the majority of the small farmers in the country. (See Figure 2 Research Centers Nos. 3, 6, 8 and 14).

a. Central Luzon Agricultural Research Center

This center is of special significance since it provides an ideal setting for research on development and adoption of production technology related to rainfed conditions under marked seasonal rainfall distribution. This differs from the setting at Los Banos and IRRI (International Rice Research Institute) where rainfall is distributed throughout the year. The Central Luzon Center will include research on cropping systems for these conditions. With the Central Luzon State University as a major part of the center, the

upgrading and improvement of facilities, library and staff quality will offer potential long term aid to undergraduate and graduate teaching programs to help meet the problems of trained agricultural manpower. The Maligaya Rice Research and Training Center has much to offer in terms of non-degree educational programs especially for farmers. Central Luzon State University presently has an undergraduate enrollment of 3,000 students, over 700 high school students and 20 M.S. degree students in horticulture, agricultural education and engineering.

b. Bicol Agricultural Research Center

This unit consists of the Bicol Rice and Corn Experiment Station, the Camarines Sur Agricultural College at Pili (300 college and 800 high school students), the Bicol University Colleges of Agriculture and Fisheries at Guinobatan (Students in Agriculture: College - 1001, High School - 747, and in Fisheries: College - 536 and 685 High School students), and several other units. The Bicol Center is, of course, of particular interest in that it will be complementary to the integrated area development project being assisted by AID. This, along with the fact that the region has a high population growth rate, and is an important rice and corn producing area, accounts for the institutions being included as a part of the proposed project.

c. La Granja Agricultural Research Center

The La Granja Center in Negros Occidental is one of the older research establishments of the Department of Agriculture. In the reorganization of the Center under the PCAR program, the Department of Agriculture entities will be will be integrated with the adjacent Philippine Sugar Institute research station. Since the Sugar Institute funds comes from a commodity tax, it will not be directly supported from the loan funds; however, its presence will provide a strong research center in the Visayas region. Aside from being the principal center for soybean and grain legume crops research, the station will focus heavily on cropping systems, sorghum and corn research as well as research in the area of soil and water resources. It is, also, located adjacent to the proposed UPLB training facility.

d. Southern Mindanao Agricultural Research Center

The Southern Mindanao Center is planned around the facilities of the Mindanao Institute of Technology. Excellent land facilities and a start in the development of infrastructure and equipment provides a good foundation for a research center. Close integration with the educational function will

strengthen the important link between teaching and research to the mutual benefit of both as well as to the PCAR network. The center is located in the principal corn producing area of the country and will broadly serve a rapidly developing area as new land is being opened to settlement. Sorghum is another crop that will be under study at the center and it potentially may offer an answer to the further development of livestock in Mindanao. The Mindanao Institute now has an undergraduate enrollment of 2,500 students in Agriculture plus 1,561 high school students. At the present no graduate degrees are being offered.

7. The Proposed Project for AID Loan Financing

The purpose of the project is to develop and improve the agriculture research capability of these four major research centers of the GOP agricultural research network listed above. The project is essentially an institution building project; however, it is expected that considerable benefit will accrue during the project span by way of research results applicable to the problems of the small farmer. The immediate benefits will be measurable in terms of improved capability to conduct research - research centers with basic infrastructure, with adequate equipment for the research mission and staffed with individuals capable of planning and carrying out the research mission and able to translate the results in a form agents of extension, supervised credit, agrarian reform, and cooperatives can use for assisting the small farmer in improving his productivity. On the longer term basis the benefits will be measurable in terms of new or improved production technology - new varieties, disease, insect and weed pest control practices, soil fertility and water management practices and cropping systems -- adapted to the needs of the small farmer.

a. Crops and Cropping Systesm

Over one-third (3.2 million ha.) of the total cropped area in the Philippines (9.3 million ha.) is devoted to rice while corn occupies one-fourth (2.4 million ha.) of the cropped area. Together these two crops employ nearly 70% of the total farm working population of 6.2 million people

The research program on rice will be carefully coordinated with that of IRRI (International Rice Research Institute) with the view of supplementing and complementing the IRRI program by focusing especially on problems of rainfed production under the different rainfall conditions in the country. Special focus will be placed on cultural practices and cropping systems for improving productivity of land and labor. Pest control, including weed control, under different degrees of water control will receive special attention. Research methodology being developed at IRRI, for studying factors affecting the application of production technology by farmers under different climatic, soil and socio-economic conditions, including the testing of the technology itself, will be applied in order to develop a better understanding of the problems of the small farmer.

With respect to corn, high priority will be given to further development of downy mildew resistant or telerant corn varieties. A high degree of tolerances has very recently been obtained in a white and yellow corn varieties. The task now is to introduce this character into other white and yellow varieties adapted to the various corn growing areas. The study of cultural practices in relation to mildew, other diseases, pest and in relation to different cropping systems will also be given high priority.

Research with sorghum, soybean and other legume seed crops will focus on exploration of the production potentials for these crops, determination of most appropriate cultural practices and determination of the place of these crops in different cropping systems.

More detailed descriptions of the status of research with these crops and research goals including projections of requirements in terms of manpower, facilities and operating budgets are provided in the reports of the PCAR teams for these commodities.

While the research centers have been given a commodity orientation, the economic aspects have not been neglected. Each of the task forces which are involved in defining research priorities and programs for the several commodities includes specialists in economics and/or rural sociology to assure that economic and social considerations are included in program and project planning. Moreover, special task forces on economics and rural sociology provide direction and research programming in those fields on a macro-level.

Cropping systems research to find alternatives to the more typical one-crop system in rice and corn areas will receive special attention. These studies will undertake to define cropping systems around corn and rice as the principal crops but including other crops which would lead to more efficient use of land and labor and to higher incomes for the small farmers. These studies will be carefully coordinated with the IRRI studies in cropping systems in relation to rice and will serve to extend the IRRI work beyond the limited agro-climatic conditions of the IRRI program.

b. Manpower Development

Essentially, in any major research efforts, the training, proficiency and/or research planning, design and management ability of staff members becomes highly important and a very

powerful factor. Recent studies of the agricultural research manpower in the Philippines indicate a great shortage in most, if not all, disciplines. As shown in Table 7, the four Agricultural Research Centers selected for partial funding under the proposed agricultural loan have a severe shortage in research manpower.

c. Infrastructure, Library, Utilities and Equipment

In the report entitled "Total Requirement for the Full Development of the Philippines Agricultural Research Capability" compiled by PCAR and the various commodity committees, there is a clear indication of a great investment need in permanent or long-term inputs for the nationwide agricultural research system. The long-term inputs include new research laboratories, upgrading of utilities, equipment storage, field and laboratory equipment, professional journals and reference textbooks plus land development. Staff housing which is a necessary incentive for researchers to stay on the job at many of the outlying field stations constitutes a major phase of the overall plans at the four centers.

The estimated funds needed for upgrading and the full development of the four agricultural research centers selected to be financed in part by the anticipated loan are shown in Table 8. The total input need for buildings, equipment and land development is approximately $10.63 million or $11.96 million including staff training.

8. <u>USAID Activities in Support of Philippine Agriculture and the Development of the Rural Sector</u>

The rural sector has been the principal area concentration of AID programs in the Philippines since 1970. This sector has, also, become a high priority in GOP development efforts as contrasted by the heavy emphasis given to the urban area during the 1950s and 1960s.

Specific AID-supported activities in agriculture and rural sector include the following:

a. Small Farmer Income and Production

Projects aim at:

(1) Development of program management and reporting system.

TABLE 7

Manpower Training Needs of the Four Selected Agricultural Research Centers Shown in Scientist-Man-Year (SMY)*

Stations	S M Y* Requirement			S M Y* Presently in Centers			SMY-GAP Needing Training		
	PhD	M.S.	B.S.	PhD.	M.S.	B.S.	PhD.	M.S.	B.S.
Central Luzon Res. Center	28	65	68	6	20	25	22	45	43
Bicol Research Center	9	43	45	1	9	35	8	34	10
La Granja Res. Center	20	28	30	0	1	32	20	27	(2)
So. Mindanao Res. Center	17	79	80	1	8	8	16	71	72
Total	74	215	223	8	38	100	66	177	123

* SMY - Scientist-Man Year

TABLE 8

Funds Needed for Upgrading and the Development of the Four Agricultural Research Centers (5 Years)

In Million Pesos

Centers	Personal Services	Operations	Lab & Field Equipment	Laboratory Building	Staff Housing	Land Development	Training Manpower
Central Luzon Agr. Res.	10.083	15.566					
1. Central Luzon State U			2.80	5.21	4.65	1.20	2.80
2. Maligaya Rice & Training			0.35	0.29	-	-	
3. BFD Forestry Sta.			0.02	0.07	-	-	
Bicol Agr. Research	4.290	4.516					
1. Bicol Rice & Corn			0.72	3.90	1.29	0.54	1.32
2. Camarines Sur Nat. Ag. Col.			1.16	1.10	0.80	0.95	
3. Guinobatan Exp. Sta.			0.20	1.40	0.50	0.44	
4. Bicol Univ. College of Agr.			-	1.30	-	0.75	
5. Bicol Univ. Fish. College			0.68	1.40	-	0.15	
6. Ateneo de Naga			-	-	-	-	
La Granja Agr. Res.	7.338	11.159					
1. La Granja Exp. Sta.			3.00	10.20	3.10	3.82	1.42
2. La Granja Stock Farm			-	-	-	-	
3. La Granja Sugar Cane Sta.			-	-	-	-	
Southern Mindanao Agr. Res.	9.858	17.682					
1. Mindanao Inst. of Technology			4.67	7.50	5.68	4.50	3.80
Total Pesos	31,569	48.923	13.60	32.33	16.26	12.35	9.34
Total U.S. Dollars Million	($4.509)	($6.939)	($1.94)	($4.61)	($2.32)	($1.76)	($1.33)

(2) Field testing research finding

(3) Development of a more efficient and effective credit system (PL 480 generated pesos have been important element in the activity).

(4) Research an control of rodent population through U.S. Bureau of Sports Fisheries and Wildlife/ AID/W/TAB funded project.

b. The Rural electrification program has provided power to 160,000 customers representing over a million people.

c. A development program working in provinces to provide basic infrastructure such as feeder roads, irrigation systems and assisting in provincial planning and public administration.

d. Bicol River Basin Development Project a multidisciplined program for the development of 312,000 hectares river basin in southern Luzon. One of the proposed research stations in the Basin.

e. Agrarian Reform - supports Philippine Government initiatives to reduce/eliminate rice and corn tenancy. The project is helping to strengthen GOP capabilities for rapid transfer of titles and transforming program beneficiaries into independent, more productive farmers.

f. Nutrition and family planning activities supported by AID are given heavy emphasis in the countryside.

g. Aquaculture Research - The goal of this project is to perfect fishpond technology, specifically to increase per hectare production of fish at lower cost. (Contract with Auburn University for service of scientists and academic training to Philippine scientists.)

h. Policy Research - Agriculture Diversification and Marketing - Utilizing the services of two (2) USDA-ERS Economists (AID/W/TAB funded).

i. Associated Agricultural activities - partial support to the four following programs:

(1) International Rice Research Institute (IRRI/AID/W/ TAB funded.

(2) Southeast Asia Region Colleges of Agriculture - (AID/RED Bangkok) at Los Banos.

(3) Asian Vegetable Research Center (AID/RED Bangkok) in Taiwan with sub-station at Los Banos.

(4) Centro Internacional de Mejoramiento de Maiz y Trigo (CIMMYT) (AID/W/TAB)

The GOP priorities in agriculture places heavy stress on increased food production so as to improve the level of nutrition of the population, reduce the level of imports of basic foods and increase rural income. These programs focus on the development and dissemination of improved production technology and improvement in services to the

small farmer so as to make it possible for more widespread application of useful technology. The research program is designed to provide a continuous stream of information and improvements in technology applicable to a wide variety of conditions which prevail throughout the country. The strengthening of the institutional capability made possible by this project will greatly enhance the ability of the GOP to discharge this responsibility.

9. Other Resources Available for the Agricultural Sector

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

A newly completed UNESCO project provided certain educational and laboratory equipment and materials to a number of colleges of agriculture which make up a part of the research network as designed by PCAR. Some of the equipment has contributed to the research capacity of these institutions. Similarly an IBRD project for upgrading colleges of agriculture is expected to contribute to increasing research capability and especially the capacity for manpower development at the lower levels.

Assistance in coconut and fisheries research is being provided by the UNDP/FAO, while Japan is providing assistance in fisheries research through SEAFDEC. AID is providing assistance in Inland Fisheries research and extension, as well as for the Rodent Control Center at Los Banos.

The Ford Foundation made a grant to PCAR for "start-up" while Canada is providing assistance through SEARCA for the Scientific Literature Service program.

Other activities having similar objectives or relationships:

(a) A UNDP/FAO soil fertility project which is nearing completion;

(b) A UNDP/FAO project on soil classification;

(c) UNDP/FAO project on grain handling, storage and processing. This is closely related to the IBRD loan for grain storage and processing.

(d) A Federal Republic of Germany rodent control project.

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 a wide range of AID and other donor activities already listed, plus a Japanese loan to establish a network of seed processing and distribution installations, integrated area development projects in various stages of development by AID, IBRD, ADB, Japan and UNDP; irrigation development projects by the ADB in Mindanao, by the IBRD in Northern Luzon and Pampanga, and for ground water development by UNDP/FAO, an IBRD loan for grain storage and marketing.

The programs of the International Rice Research Institute and Centers (IRRI, CIAT, IITA, CIMMYT, AVRDC and ICRISAT) have definite relevance to the agriculture research programs overall and specifically to this project. Formal memoranda of understandings have been drawn up between PCAR and IRRI and PCAR and AVRDC to govern cooperative relations, to enhance complementarities and insure as much as possible against duplication of efforts. Similar agreements are expected to be entered into with the other international research centers. (See Annex G)

10. Views of Country Team

The Country Team recommends approval of this loan.

B. Project Analysis

1. Economical Aspects

Numerous efforts have been made to measure the economic impact of research. These measurements are difficult to make because, in general, gains in productivity which are attributable to improved technology involve a variety of inputs of which the technology itself derived from research is only one. Yet without the technology the utility of the other inputs is frequently minimal.

Recent studies in developing countries have shown a close correlation between the amount and quality of research and gains in productivity. Moreover, these studies have shown that the utility of borrowed technology is a function of the capability of the local research establishment. In studies on the impact of the green revolution -- wheat and rice -- it has been shown that as a general rule the impact as measured by yield of the introduction of the new varieties and corresponding technology packages was highest with the first adopters and decreased progressively with succeeding increments of area within any given country adopting the technology. As the percentage of the area adopting the new technology approached 50% of the total (as an upper limit) the impact in terms of yield increases approached zero. This is attributable to many factors among which is that of decreasing degree of adaptability of the technology as the range of ecological conditions is broadened.

This upper limit, however, varies greatly among countries, being highest in countries with the most developed national research system and the lowest (as low as 10%) in countries with the least developed systems. Results suggest that the utility, to any given country, of the green revolution package is proportional to that country's capabilities to test the adaptability to its own peculiar range of conditions and also to modify the package accordingly. Those countries with the better developed research system, being better able to test and modify the package, derives considerably more benefit from the new technology than those less able to do so.

In attributing the gains in productivity in the developing countries over the past several years it has been suggested that approximately 45 percent of productivity gains have been the results of indigenous research systems while 35 percent and 25 percent, respectively, have been

derived from transfers from other national research systems and from transfers from the green revolution International Centers.

In the case of basic food and feed crops considered here, the potential impact of productivity increasing technology is very large because of the very low average yields currently being attained. Rice yields average only about 1-2/3 tons of rough rice per acre. There has been little change since about 1969 or since the initial impact of the new varieties developed by IRRI, the Department of Agriculture and UPLB resulted in about a 25 percent increase in average yields during the period 1965-70. While other factors were also involved in achieving this increase, a considerable portion was due to the improvement of technology. Most of this increase was obtained from land with controlled irrigation.. The development and application of better production technology from the rainfed rice areas which could result in as little as 10 percent increase in yields would mean approximately $75,000,000 per year addition to the agricultural product at current prices. Given the current low yields in comparison with those of other countries, considerably greater increases would be possible. Corn appears to offer even greater potential. Current yields of about 0.8 metric ton are among the lowest in the world. There has been little change in yields during the past decade. The development of high yielding mildew tolerant varieties and accompanying improved production practices could easily increase corn yields by 50-100 percent. This could mean an increase in the agricultural product of about $10 to $20 million per year at current prices.

In terms of total production, sorghum, soybean, and other legume-seed crops are still of relatively little importance. In terms of providing an important element in the diet of the farming population, however, the legume-seed crops are of considerable importance.

Interests in these crops also stem from the expectation that these crops will play an important role as feed for obtaining higher yields of individual crops. Research in cropping systems could be equally effective in increasing total production and incomes, particularly of the small farmer with limited land areas, by making it possible to produce a succession of crops through the year which would make more effective use of land and labor.

Since three of the four centers contain colleges/ universities in their organization the long-term benefits of upgrading especially the library and the increased capabilities of the professors through the training programs will offer opportunities for much improved undergraduate and vocational technical high school education program on campus. With the proposed improvement in the staff members at the school involved it is assumed that they will be in the position to, in a few years, offer at least the M.S. level graduate training which will be vitally needed in the expansion of agricultural research under PCAR or in agricultural-related private research effort. Measuring the economical impact for the improved education opportunities pose the same problem in accurate measurement as experienced with research and crop productivity. The Annex H illustrates, through membership on the three commodity committees -- corn and sorghum, rice and soybean, and other legumes, the long-range benefits of monies invested 10 to 20 years ago in human resource improvement. Their positions as developers of research priorities, evaluators and decision-making for agriculture and its growth are valuable assets for the Philippine worth much more than the original investment in advanced degrees.

2. Project Beneficiaries

a. Small Farmers

Increasing the productivity of the small farmer is the ultimate goal of this loan. Approximately 70 percent of the Filipino farmers involved in the production of corn and rice, till less than five hectares of land. It is this group that will benefit from the improved technology generated as a result of better trained research manpower and improved facilities.

The average income of the 2.6 million rural farm families in 1971 was ₱2,463 ($350). The typical small farmer sells from 1/4 to 1/2 of his total production with the remainder groing to feed his family of 5 to 7 children. He is productively employed about half of the year. His landholdings are generally too small to afford keeping a carabao (draft animal) so that he shares one with a neighbor. He lives in a very small partially weatherproof house without plumbing and electricity. He is often some distance from an all-weather road and public transportation. He consumes fewer than 2,000 calories a day and has 3-6 years of formal education. Only about one-third own the land they are farming.

Although the average Filipino farmer has limited resources, is underemployed, underserved, and isolated, experience has shown that he will respond to economic opportunity and dedicated leadership.

New technology developed on food and feed grains will provide the small farmer with the opportunity to increase production on a limited area; these are the crops he grows and that the market demands.

Since arable land area is limited, indeed nearly all of the tillable land is now under cultivation, increased yields per hectare must be achieved through multiple cropping systems with higher yields per crop. The role of the small farmer becomes even more important in the years ahead as the population increases. By the year 2000, it is estimated that the population of the Philippines will exceed 80 million --double the current population. To feed this population at present standards (on a per capita basis, the Filipino diet is 15 percent deficient in calories), production must also double. Rice and corn yields did not double in the past 45 years, and one could not expect them to double in the next 25 years without an intensive research program to develop high yielding varieties that are resistant to the most destructive pests and diseases, early maturing to enable multiple cropping and tailored to special soil or climatic conditions.

Irrigation will enable farmers to grow crops throughout the year, but it will also intensify the farmers management problems. Through research the small farmer can benefit from the new seeds and farming systems that will enable him to achieve top production throughout the year. This is not to say the farmer who has irrigation facilities is the only one to benefit from the research. The small farmer utilizing rainfed conditions will also benefit from research that demonstrates ways he can manage his environment for increased production. For example, research is showing the way to a double crop of rice by direct seeding using an early maturing variety as the rains begin, then planting a "normal" rice crop during the middle of the rainy season. This practice would not be possible without the early maturing varieties developed through research.

b. Intermediaries

To reach the small farmer it is essential to train those who develop and extend the new technology. This project will provide higher educational opportunities for a total of 334 man-years of reasearch training directed toward food and feed crops. The group of trained agricultural scientists will not only aid in solving present production problems, but also offer the added feature of being able to approach and solve problems that will surely arise within the next 10 to 20 years. Since three of the four centers under consideration include colleges of agriculture, the benefits to be derived by high school, undergraduate and limited graduate student bodies (presently a total of 7,337 undergraduates, 4,493 Vocational Technology high schools and 20 M.S. degree students) from new infrastructure, laboratory and field equipment and especially improved library facilities will be important.

Since all researchers probably have some teaching assignments within the college, the improved staff training will have the greatests impact on the student and their long time service to the agricultural industry. To illustrate the impact, if all of the present undergraduates (over 7,000) actually entered agricultural extension work (using the ratio of one agent to 250 farmers) they could service the needs of slightly less than one-half of the

present corn and rice farmers. This clearly indicates that improved teaching in college by upper level staff can have a vital impact on agricultural activities of the future. It is doubtful that few, if any, inputs will produce greater returns on investment in agriculturally oriented nation than a pool of highly qualified group of agricultural scientists. This activity of training actually makes double use of money.

c. Institutional Development

The immediate target of the proposed research program is to develop and improve the research capability of four major agricultural centers administered by PCAR. This is essentially an institutional building project including infrastructure, library addition and materials and finally a large amount of manpower training. While the chief purpose is to upgrade research capacity and efficiency, the centers were selected because of their major research efforts in the area of the food and feedgrain crops especially rice, corn, sorghum, soybeans and related legume-seed crops with corn and rice as the major crop.

A secondary aspect of the proposed research loan will be to strengthen PCAR's leadership role in the administration and management of agriculture research resources. As discussed previously, prior to the development of the national Agricultural Research Network, there were many wasteful organizational and management problems. With the organization of PCAR in 1972, much progress has been made in research management, including reorganization, accurate accounting of present facilities, assessment of manpower, review of research projects, well developed budgets and a much better understanding of research needs. The coordinating function will enable PCAR to play a major role in establishing agricultural research priorities to meet the needs of the small farmers.

3. Employment of Women in Agricultural Research

In an effort to determine the employment practices in relationship to women at the professional research level, a review was made of the professional staff at the four research centers being included in the loan program. Table 9 indicates the results of the survey.

TABLE 9

Number of Professional Agricultural Staff at the Four Agricultural Research Centers

Research Centers	Men	Women	Total
Central Luzon Center	72	15	87
Bicol Center	52	16	68
La Granja Center	32	13	45
Southern Mindanao Center	32	5	37
Total	188	49	237

Forty-nine professional women agriculturists, approximately 20 percent of total, are employed at the centers and their training includes disciplines as: plant, pathology, bio-chemistry, seed technology, food technology, etc. The PCAR Secretariat employs 23 women of a total staff of 49, or 46 percent. The directors of research at two centers, Central Luzon and Bicol, are women. The 29 National Commodity Research Teams under PCAR with a total membership of 378 outstanding agricultural scientists in the Philippines include 41 women scientists or about 11 percent of total.

Of the group of students now receiving PCAR support scholarships (59 awards -- 1974-75) for professional training, 21 or 35 percent are women. This includes one PhD, 14 M.S. candidates in agriculture, and six B.S. candidates of 15 awards for fisheries. The women are being trained in the following areas of disciplines; soil physics, food chemistry, pulp paper technology, marketing statistics, nutrition, family management, crop physiology, biometry, microbiology, meat processing, agri-business management, aquaculture, and fisheries.

Considering the positions now occupied and students in training, women appear to have an equal opportunity in any area or discipline in either agriculture or fisheries. It appears that selection for training or a research position depend chiefly, if not totally, on qualifications, interest, and degree of training in the field. If present trends continue in the training area, the percent of women working in research under PCAR will surely increase.

4. Small Farmer/Research Linkage

Linkage between the small farmer and the research hierarchy of PCAR is important if research is to be useful to the small farmer. To strengthen the feedback linkage, PCAR is attempting at every level to coordinate directly with the farmer and those who regularly work with him. The following examples illustrate the extent of PCAR's efforts:

1. A PCAR-Extension linkage conference was held in February 1974, to strengthen the bond between research and extension. Similar conferences are held from time to time to open the channel of communication.

2. The Governing Council of PCAR has one member and theTechnical Program Planning and Review Board (TPPRB) has three members from the private sector.

3. The TPPRB Vice-Chairman is Executive Director of NFAC that has national authority to manage action programs related to food production and deals directly with small farmers through the production/extension technicians.

4. Representatives of extension and development oriented agencies, both government and private, are included in the national commodity research teams.

5. Membership of the Regional Agricultural Research Center Advisory boards will include regional directors/officers of such extension oriented service agencies as the Bureaus of Agriculture Extension, Plant Industry, Animal Industry, Soils, Fisheries, and Aquatice Resources and Forestry.

6. Training of farmers and farmer leaders at the research centers and stations as well as farm demonstrations and meetings where research scientist participate as resource persons will provide a direct contact with farmers and their problems.

7. PCAR has initiated a series of publications entitled "The Philippines Recommends for .....". Presently publications have been issued for four commodities with plans to issue 31. These publications contain the latest research information for each commodity and are designed for the professional worker. The Bureau of Extension is encouraged to publish the information in a simplified form in various dialects for distribution to the public.

PCAR is attempting at every level to serve as a vital link between the small farmer, extension agents, the researchers and administrators so that research projects are undertaken to help the small farmer increase production and income on the one hand and meet the national objectives of increased food on the other.

5. Utilization of Research Results

Primary responsibility for transferring information obtained from research programs (on rice, corn, sorghum and soybeans or other legumes) to small farmers is given to the Bureau of Agricultural Extension of the Department of Agriculture. Through past performance this unit has demonstrated the ability to transfer information to small farmers as demonstrated by the Masagana programs for small corn and rice producers. Other extension agents such as those of the Bureau of Plant Industry, Soils, Supervised Credit technicians of rural banks and others transmit new production technology to small farmers.

The spread of high yielding rice varieties, illustrates the susceptivity of the Filipino farmer to new and proven technology. New high yielding varieties spread rapidly or slowly in the Philippines, depending on (1) diffusion efforts by responsible government agencies, (2) reaction by farmers to the new variety, (3) how well a variety meets a "need" of the moment, and (4) how well the new variety performs on farmers fields.

At the time IR 26 was released in November 1973, it had all four factors in its favor. The Department of Agriculture actively encouraged farmers to use this variety to meet the acute epidemic of brown planthoppers, and grassy stunt, a virus disease, to which IR 26 is resistant. Two thousand, one-kilogram kits were distributed in seriously affected areas plus 6.6 metric tons of seed provided to the Bureau of Plant Industry (BPI) for multiplication followed by another 2.2 tons in March 1974. All IR 26 distributed to BPI went to selected seed growers and some to BPI stations in the brown planthopper affected areas. As a result of this effort, within 12 months there was more than enough IR 26 seed to plant all of the 1975 dry season crop of 500,000 hectare.

In short, the Philippine Government has demonstrated the ability to spread the new technology to farmers. The farmers in turn reacted positively after reviewing the actual resistance of IR 26 to brown planthopper and grassy stunt virus disease. This new variety met their need of the moment.

Finally, a superb dry season performance, yieldwise, of the variety made IR 26 an unqualified success only 15 months after its release by IRRI.

PCAR, as the center for the national program of agricultural forestry and fisheries research, has accepted a clear interest in seeing that research results move to the user as rapidly as possible. Through the PCAR outreach programs which provides extension specialist at the centers to convert information to more readily usable form, nationwide radio and T.V. coverage addressed to the farm population, improvement of communication between all government agricultural worker via seminars or workshops, and publications, etc., are a few of the ways this research unit hope to get greater use made of research results from its country wide research program.

Since research data from this project covering the food and feed grains, should be going to 70 percent or more of the farming population, the job of communications and the full utilization of findings becomes very important.

6. Philippine Government Plan Aimed at Keeping Researchers/Scientists in the Research Organization

In an effort to place the country on a sound scientific and technical footing, President Marcos directed his advisers to draw up programs designed to give Filipino savants added recognition and a larger role in national development efforts. Specifically, he has singled out the need for giving priority to a comprehensive review and a drastic revision of existing government policies that might have retarded the growth of science in the Philippines. Among these policies are: (a) low salary scales of Filipino scientists; (b) bureaucratic proceedures that continue to hamper the conduct of research activities; and (c) incentives that would bring home from abroad Filipinos with advanced training to serve in the Philippine scientific research establishments as well as arrest the steady migration of Filipino scientists. Talented Filipinos have often remained in countries where they want to take advance studies. Local facilities for such level of training deserve to be strengthened to encourage such groups of Filipinos to remain at home.

PCAR, as the country's central authority for agricultural research, has drawn up the following general plan to keep researchers/scientists within the country's agricultural research system:

a. PCAR scholars are required to sign a service contract to serve two years for every year or fraction thereof of scholarship.

b. Work for the exemption of all researchers in agriculture, forestry, and fisheries from the qualifications in civil service eligibilities and the Wage Administration and Position Classification Office (WAPCO) standards (salary standardization for all government personnel).

The technical personnel of the U.P. College of Agriculture enjoy these exemptions and have a higher salary scale system than those in the ordinary bureaus/ offices.

At present, the provision of honoraria (incentive pay) to researc hers of PCAR and NSDB-financed research projects is helping to temporarily relieve the financial difficulties encountered by researchers.

c. Work for a general increase in the salary scale of researchers/scientists. Spadework is underway on this.

d. Work for increased opportunities for researchers to undertake post-doctoral short-term studies, as well as attendance in international scientific conferences.

e. Improve existing staff housing facilities and expand the number of such housing units in the field stations.

f. Improve library facilities in the station network as well as other ways of making technical information accessible to researchers.

g. Through the initiative of PCAR a workshop of some 100 research administrators, key budget officers, accounting officers and auditors of the Philippine government has formulated concensus on a comprehensive set of reforms in procedures for the budgeting, accounting and auditing of research funds aimed at bringing to the researcher his experimental materials and other logistics at the time and quantity needed.

h. PCAR jointly with the National Science Development Board is about to implement a program of incentives to bring home from abroad Ph.D. degree holders in agriculture, forestry and fishery for assignment in the colleges and universities within the PCAR network of research centers and stations.

7. Development Policy

Since 1970, the Philippine Government has initiated numerous basic economic and social reforms to provide the policy and institutional environment for the attainment of economic and social goals. Between 1970 and the declaration of martial law in September, 1972, a number of significant reforms were undertaken. In early 1970, a foreign exchange reform involving a major devaluation of the peso and the adoption of a floating rate scheme was implemented. A stabilization program was also started as part of a stand-by arrangement with the International Monetary Fund. As pre-conditions for the formation of a Consultative Group in 1971, the Philippine Government complied with the terms of the stabilization program with the IMF, formulated a realistic four-year development plan, and took steps to increase its tax revenues. :Technocrats: were recruited into high-level posts in the government and the quality of development management was improved greatly as a consequence. Major studies and plans were also developed, particularly for the reorganization of government, and the restructuring of the tax and tariff, financial, and educational systems. These studies and plans laid the groundwork for the rapid implementation of many reforms initiated under martial law. The major reforms under martial law include the acceleration of the agrarian reform program; the reorganization of government; tax and tariff reforms to improve the investment climate; banking and financial reforms to help mobilize resources for development and to establish a more stable and better regulated financial structure; liberalization of regulations on foreign investments; reorientation of industrial policies towards export expansion, industrial dispersal, and labor itensification of production techniques; realignment of labor laws and policies to make them more employment-oriented; and the intensification of the population/family planning program.

A major focus of recent reforms has been the strengthening of the government's development planning and management capabilities. Under the ongoing government reorganization, the past disjointedness of planning activities has been remedied by merging the various existing agencies and ad hoc bodies involved in planning into a single planning agency, the National Economic and Development Authority (NEDA). The NEDA effectively links policy-making and planning to program and project implementation since its Board is presided over by the President and is composed of cabinet level officials involved in formulating and executing sectoral development activities. Program planning and budget planning and allocation have also been effectively linked with the creation of a Presidential Budget Coordination Committee (PBCC)in 1970. The PBCC has been retained as a permanent agency and has been attached to NEDA. The Committee continues to determine the

level and functional allocation of government expenditures. Also attached to NEDA is the Investment Coordination Committee which coordinates the investment policies of government financial institutions towards development priorities.

The ongoing reorganization also stresses the strengthening of the planning capacities at the department level. This should result in a pipeline of development projects reflecting sectoral objectives and should contribute to a more balanced and coordinated public investment mix. It is intended that the NEDA will operate in a review or control capability by setting technical standards, coordinating and integrating agency plans with overall economic and social priorities and reviewing financing implications in the light of competing needs.

Another important aim of the government reorganization is to decentralize the planning and implementation functions of the national government. Regional offices of national government line agencies are being established in each of the eleven administrative regions of the country. The planning and implementation activities of these regional offices will be coordinated by Regional Development Councils (RDCs) which are being established by the NEDA. Eight (8) RDCs have been set up and are now operational. The RDCs will also be responsible for the vertical coordination of plans and programs between the national government (through the regional offices of national agencies) and provincial governments. The planning and program execution capabilities of provincial governments are also being developed and upgraded. Most provinces now have a Provincial Development Staff which is responsible for the preparation of comprehensive provincial development plan that realistically reflects national priorities and inputs.

8. Agriculture Policy

The GOP has positive policies to increase production and are reassessing these policies periodically to see that they are reaching the small farmer. National objectives, as stated earlier, (p. 8) are for increased food production aimed at self-sufficiency in the basic staples, rice and corn - crops produced on farms averaging 2.5 to 3.0 hectares. As evidence of this concern, a group of GOP policy makers held a three day seminar at Los Banos recently to discuss agricultural policy. National Economic and Development Authority Secretary Gerardo P. Sicat told the group as reported in Business Day (April 23, 1975)"...the government will continue to give top priority to food production as a means of

insulating the country from the ill effects of the prevailing worldwide shortage of commodities and as a hedge against the threat of inflation on the already reduced buying capacity of the low income masses.....food production programs assumed greater urgency in view of the worldwide shortages of food and the perennial deficiency of the average Filipino diet of some basic food." Dr. Sicat announced that some ₱3.2 billion would be channeled into food production programs in 1975 compared to ₱2.6 billion during the previous year. Annex L lists the recommendations made by the agricultural policy group.

Because of a concern for the small farmer, the GOP has taken action to institutionalize a comprehensive and coordinated system for supplying needed production inputs, credit and marketing. Responsibility for this system rests with the National Food and Agriculture Council (NFAC). This council, chaired by the Secretary of Agriculture, was established as a coordinating body for all activities related to food production and to exert influence on the organizations concerned with agricultural production and the problems of small farmers. These organizations include: (1) government agencies largely in the Department of Agriculture involved in research, extension, marketing and credit; (2) import suppliers, financial and marketing organizations in the private sector; and (3) research and educational institutions. Because of inherent weaknesses of implementing programs through diverse agencies, NFAC has gone beyond its initial coordinating role and now, in effect directs national programs aimed at increasing food production and incomes of small farmers.

NFAC has a full time Director and staff drawn from other bureaus as well as new employees Through management committees, NFAC has a strong voice in agriculture policy development related to credit, fertilizer subsidies, price support and marketing. Because of the active involvement of the Secretary of Agriculture, recommendations for policy changes are carried to the highest levels of government for approval. For example,price support levels on rice, corn and feedgrains, largely by small farmers, have been increased several times in the past few years to keep abreast of increased cost of agro-chemicals and other farm inputs. A permanent management information system has been established in NFAC and the Bureau of Agricultural Economics to detect logistical problems related to availability of quality seeds, fertilizers, and agro-chemicals so that remedial measures can be taken promptly.

As an indication of progress in supporting the small farmer, a non-collateral credit program initiated under the national rice program (Masagana 99) in 1973-74 (major season) resulted in ₱695 million being loaned to 445,898 small farmers compared to ₱370 million to 123,200 farmers the previous year. A similar program started for corn farmers in 1973-74 enrolled 95,774 farmers in a supervised production credit program.

Commercial fertilizer consumption in the Philippines increased from 90,000 m.t. in 1964-66 to 210,000 in 1971-73. During this same period per capita fertilizer consumption increased from 13.9 kg to 22 kg. The GOP has had a policy of supporting fertilizer prices to producers of food crops while charging the full price to growers of export crops. Because of difficulties experienced in monitoring this system it is under review.

The above examples are illustrative of the concern and action of GOP officials at all levels to help the small farmer and to increase the nations food supply.

9. Financial Ability of GOP

Perspective of Development, 1975-1979

The Philippine enters the second half of the 1970s confronting serious economic and social problems. In the near term (1975 and possibly up to 1976), the economy has to contend with a continuing high inflation rate as well as a worsening of the balance of payments. Since mid-1973 consumer prices have been rising at an annual rate of more than 40 percent as a result of a substantial expansion in liquidity since the export boom began in 1973, and a number of cost-push factors, including the higher rate of world inflation, domestic food shortages, and the increased cost of pertoleum. Monetary and fiscal policies have aimed at absorbing excessive liquidity and during the second half of 1974, the rate of inflation began to slacken. The annual rate of inflation dropped to about 29 percent by the end of 1974. Assuming no new major upheavals in key commodity markets, the rate of price inflation should moderate further in 1975. Even if this were to happen, it is likely that inflation would still remain much above the secular trend and would continue to have unfavorable welfare implications especially for urban wage earners who have been most affected by the high rate of inflation since 1970.

In its November 1974 report on the Philippine economy, the IBRD projected a worsening of the balance of payments situation for the Philippines over the next two years. A current account deficit of $650 million and $1,070 million is projected for 1975 and 1976, respectively, compared to an estimated deficit of $450 million in 1974. Given its present debt service ratio of about 15 percent, the economy has wide latitude for financing projected current account deficits through external borrowing. However, substantial amounts of additional external debt must be on concessional terms if a reversal to an excessive debt burden is to be avoided (see also "External Assistance Requirements and Sources").

Over the medium-term horizon and quite possibly beyond, the economy confronts the problems of reducing unemployment, and underemployment and improving the highly skewed income distribution. While employment opportunities have expanded appreciably over the last two years, unemployment and under-employment continue to be widespread. Aside from mopping up current unemployment and underemployment, the employment challenge for the economy during 1975-1979 is to absorb about 2 million new entrants to the labor force.

In the last two years, the Philippine economy expanded at rates above the secular growth trend. In 1973, GNP is estimated to have expanded by 9.8 percent. A 5-6 percent is committed to maintaining the growth momentum developed in the last two years and is pressing ahead with plans for a series of major agricultural, infrastructural, and industrial investments in order to lay the foundation for sustained growth in future years. Given the political will to maintain the growth momentum and the much improved policy enviroment, and provided that resource requirements indicated in the succeeding section can be met, "medium level" growth at 7 percent per year as targeted is feasible. This is higher than the average historical experience but lower than the Philippine's long-run potential, given her favorable resource endowments and human resources.

Growth during 1975-1979 is expected to be broadly distributed among various sectors, particularly agriculture, industry, and

infrastructure. It should be possible to expand agriculture by a 4-5 percent in 1975 and probably maintain about the same rate in subsequent years. Greater dynamism can be expected from domestic-oriented agriculture as a result of land reform and other institutional changes, as well as the continued expansion in rural infrastructure, credit and other supporting services.

The expansion of export agriculture and its contribution to the balance of payments depends heavily on overseas market conditions. The demand prospects for sugar over the medium term appear bright. The demand for coconut and wood products has been affected in the near term by the slowdown in major foreign markets, and a recovery in demand by 1975-76 will depend on how quickly major export markets recover from their present slowdown. The conservation measures on forest resources and the government's program for phasing out log exports and increasing domestic processing of wood products, are expected to shift the export pattern of wood products from logs to processed products.

Favorable industrial performance over the next five years will depend on sustained agricultural growth, an expansion of manufactured exports, and success in the selective development of intermediate and capital goods industries. Sustained agricultural growth in the future will ensure a high level of domestic demand for manufactures. Exports of manufactures are being given incentives and have consequently increased greatly over the last 2 years. Continued growth is expected as major markets recover from their present slowdown. Some progress in the development of selected intermediate and capital goods industries will be achieved due to government incentives and expansion in domestic markets.

As indicated in the succeeding section, government spending for infrastructure is programmed to expand rapidly over the next five years in order to meet development requirements. During the next year or so an increase in infrastructure spending is also being planned to take up the slack in demand induced by the high inflation rate as well as the slowdown in the economy's major export markets.

Limited gains can be achieved in reducing unemployment and underemployment over the next five years but it is highly unlikely that the unemployment rate can be reduced to 3 percent by 1977, as targeted in the Philippine Government's Four Year Development Plan for 1974-1977. Future patterns of labor absorption are not expected to vary much from those of the past. The services sector is likely to absorb much of the increase in labor force. In agriculture, employment will be generated through more intensive land use made possible through irrigation, and through an expansion in cultivated area. Additional

employment opportunities will also be provided in industry through an expansion in production and use of labor-intensive techniques.

Improvements in income distribution can be expected over the next five years through land reform which immediately benefits tenants through reduced amortization payments, and also assures that agricultural improvements such as irrigation, credit, etc. accrue to the benefit of small farmers. Improvements in income distribution are also expected through present fiscal policies and programs such as an expanded tax effort (achieved partly by increased direct tax collection) and an expanded provision of social services Income distribution is also expected to be improved through increased employment.

External Assistance Requirements and Sources

In its November 1974 review of the Philippine economy, the IBRD projected that the economy's foreign exchange requirements will amount to $2,340 million for 1975 and 1976. The projected foreign exchange gap was based on the following major assumptions with respect to trade: (a) the deterioration in the external terms of trade which started in mid-1974 would continue over the next two years; and (b) import growth would be consistent with the investment and growth requirements of the Philippine economy. Under these assumptions, the trade deficit is projected to increase from an estimated $680 million in 1974 to $820 million and $1,250 million in 1975 and 1976, respectively. Receipts from merchandise exports are projected to increase by about 30 percent in the next two years while import payments are projected to rise by almost 40 percent, including a 30 percent rise in prices. In real terms, exports are projected to grow more rapidly than imports over 1975-76, but this gain will be more than offset by a projected cumulative decline in the external terms of trade of about 23 percent. This would bring the terms of trade back to the level that prevailed in 1972, thus wiping out the gains made in the recent boom in export prices.

The current account deficit is projected to amount to $650 million and $1,070 million in 1975 and in 1976, respectively. In each of these years, loan repayments would amount to $310 million annually. The Philippine external capital requirements for 1975-76 thus amount to $2,340 million.

The IBRD projects that of the required external capital, about $190 million is expected to be provided from net direct foreign investment. An enlarged inflow of foreign equity investment is forecast because of much improved prospects for private foreign investment. Short-term trade credit is projected to provide about $480 million. The greater use of short-term trade finance is consistent with the much higher level of import

payments and does not represent an unduly large accumulation of short-term private debt. About $800 million is expected to come from disbursements or suppliers' credits and other medium- and long-term commercial loans to the private and public sectors. About $280 million is projected to come from disbursements of concessional project assistance from Consultative Group Members. The balance of $590 million ($180 million in 1975 and $410 million in 1976) would have to be provided from other borrowings.

The projected $590 million gap could be financed by Central Bank short- and medium-term borrowings. This might even increase gross international reserves, but would reduce net reserves to a negligible level by 1976. This would leave the Philippines with very little room for maneuver if the terms of the trade continued to decline after 1976. Besides the possibility of very quickly having negative net reserves, additional short-term borrowing could result in having to roll over a large short-term debt, or to the extent that medium term borrowing is arranged on commercial terms, a medium-term debt management problem could occur. In view of these adverse implications for the reserve position and external debt management, the IBRD recommended that excessive recourse to short- and medium-term borrowing by the banking system be avoided.

As an alternative to short- and medium-term borrowings, the IBRD suggested the provision of an appropriate combination of quick disbursing commodity assistance with long maturities and medium- and long-term loans to meet projected foreign exchange shortfalls. A combination of commodity assistance from Consultative Group members (about $75 million) and possible assistance from an IMF special oil facility would suffice to meet import requirements in 1975 and maintain at the same time a reasonable external debt profile. The much larger shortfall in foreign exchange availabilities projected for 1976 would have to be financed by a combination of commodity assistance (about $75 million) and medium- and long-term loans to avoid an undue increase in debt burden in later years. The medium- and long-term loans would be used to finance capital goods imports which are projected to reach $12. billion in 1976.

The IBRD concluded that if the projected inflows on the capital account are forthcoming, and if the projected shortfalls in foreign exchange availabilities are financed in the manner suggested, management of the external debt and debt servicing would not present serious problems. The IBRD projects that external medium- and long-term debt outstanding would rise from $2 billion this year to about $3 billion by 1976. The ratio of debt service payments to exports would fall from 15 percent this year to about 13 percent in 1976.

It would then grow somewhat mainly as a result of the projected increase in public and private commercial borrowing to about 16-17 percent by the latter part of the 1970s. This assumes that external terms of trade would stabilize beyond 1976.

10. Administrative Ability

As discussed under the section on PCAR p. 12, the Philippine Government has the administrative system established to plan, coordinate, and implement a wide range of agriculture research projects. It is the opinion of the team members, that PCAR has the administrative ability to fully utilize the various consultants, administer the funds for construction and commodities effectively and to select the type of manpower to be trained for the years ahead.

C. Project Implementation

1. Project Requirements

a. Resources and Activities

The Government of the Philippines (GOP) through the Philippine Council for Agricultural Research (PCAR), a network of 14 research centers and 56 cooperating or satellite stations which have been established in the aggregate, provides a resource base capable of making meaningful contributions to Philippine agriculture. Through PCAR significant progress has been made in agriculture research through reorganization and national planning, studying and reviewing the future research need by commodity groups, reviewing and recording the requirements for updating and modernizing infrastructure, research laboratory equipment, library holding, staff housing, etc. Also, a complete study has been made of staff training requirements both in-country and international.

This project has been developed to assist in improving the capability for agricultural research at four Research Centers by providing, in part, facilities, laboratory and field equipment and funds for manpower development. The four centers have major responsibilities in rice, corn, sorghum, and legume research which is vital to the economy and well-being of the small farmer families throughout the Philippines.

b. International Research Consultants

The requirement for international research advisory

assistance for this project is by comparison with similar loans very minimal. This results from the fact that PCAR has organized some outstanding and highly qualified agricultural scientists into a wide range of national commodity research teams. The team duties include, along with research directors and the PCAR secretariat, review of the commodity situation, pinpoint research in problem areas, review work underway, establishment of research priorities and evaluate research progress and performance. Technical services needed during the first three years of the program and funded under the loan will consist of six months (2 months per year) of a high level research administrator to assist the Director General of PCAR and the Station Superintendent and/or center Research Directors on research programming, direction and management of research, and training. Short time technical (66 man/month) advisory services on specific research problems relating to the basic food and feed grains will be provided on continuous and intermittent basis during a five year period. Table 10 provides information regarding technical assistance. USAID will provide on a grant basis, a direct hire Project Manager to assist with implementation of this loan as well as other research related activities.

c. Manpower Development

One of the serious problems confronting PCAR and the network of Agricultural Research Centers for the present and very immediate future, is the general lack of sufficiently well trained research staff in most, if not, all major disciplines. The staff development appect of the project will supplement on-going manpower development programs and will rely to the maximum extent feasible on local training institutions. Approximately 20 percent of the total loan funds is allocated for manpower developments. Of this amount slightly less than one-half will contribute to the scholarship fund which is administered by PCAR. In cooperation with the graduate school of the University of the Philippines at Los Banos (UPLB), the training funds will be used to sponsor M.S. and PhD level scholars. Some training may be carried on at other colleges in the University of the Philippines, for example, the College of Business Administration. It is also expected that Central Luzon State University (CLSU) will be in the position in the near future to expand its M.S. degree programs.

(1) In-country Training. The estimated needs for in-country M.S. and PhD level training for the

Table 10. International Scientists and Advisors Required

	No.	Total Man-Months	Year 1	2	3	4	5	Estimated Cost ($100)
Short Term								
Research Administrator	1	6	2	2	2			26
Plant Physiologist	1	9	-	3	3	2	1	42
Soybean Agronomist	1	11	2	3	3	2	1	50
Plant Pathologist	1	11	3	3	2	2	1	49
Entomologist	1	8	-	2	3	2	1	38
Weed Control Spec.	1	8	2	2	1	2	1	36
Cropping Systems Spec.	1	9	1	2	3	2	1	42
Research Management	1	4	-	-	2	1	1	20
Total		66	10	17	19	13	7	303

staff who are working or will work at the four centers under this project are presented in Table II. The proposed training program includes funds for 100 M.S. and 30 PhD degrees. Based upon information from the Graduate School at UPLB and PCAR officials the estimated cost per M.S. and PhD degree is 21,000 ($3,000) and 32,000 ($4,600) pesos, respectively. Most of the research staff receiving the opportunity to participate in the graduate program will continue to receive their regular salary from the budget of their respective Agricultural Research Center.

(2) International Training. Three specific types of international training have been proposed under the program to improve the capability of agricultural researchers in the four centers selected for partial funding and the members of the teaching and research staff at the UPLB College of Agriculture.

Degree training in foreign institutions will be limited to PhD level and in field wherein local institutional capability is limited. Some of the eight positions will be used to upgrade and/or to maintain the high quality of the UPLB faculty which has the chief task of supplying the agricultural research network operating through PCAR with over 300 PhD and 900 M.S. graduates within a 10 year period. The key for future growth and development of agriculture and the improved socio-economic status of the thousands of farm families throughout the Philippines, depends greatly on the capable graduates entering positions involving research, extension and agricultural industries in the country. For the same reasons indicated above, 20 positions of the post graduate type, 6-12 months, have been established under the loan for recent Philippine graduates completing PhD degrees, professors from UPLB and the research staff from the four research centers for obtaining upgrading or refresher experience. This will offer to the participants the opportunity to broaden and expand their knowledge and research breadth in their respective disciplines under a new environment where a different approach or point of view could exist.

TABLE 11

In-country Training of Research Staff from
Four Agricultural Research Centers
(2 years for M.S.; 3 years for PhD)

	Years 1	2	3	4	5	Total No.	Total Man/ Months	Cost $ x 1000
Crop Improvement								
M.S.	2	2	3	3		10	240	30
PhD	1	1	1			3	108	14
Crop Protection								
M.S.	5	4	5	4		18	432	54
PhD	1	3	2			6	216	28
Crop Prod. Mgt.								
M.S.	2	4	4	3		13	312	39
PhD	-	3	3			6	216	28
Economics								
M.S.	4	3	4	3		14	336	42
PhD	1	1	1			3	108	14
Plant Physiology								
M.S.	2	2	3	2		9	216	27
PhD	-	1	2			3	108	14
Crop Utilization								
M.S.	3	5	3	3		14	336	42
PhD	1	1	1			3	108	14
Soil and Water								
M.S.	3	3	2	4		12	288	36
PhD	1	2	1			4	144	19
Rural Sociology								
M.S.	2	3	3	2		10	240	30
PhD	-	1	1			2	72	9
TOTAL								
M.S.						100	2400	300
PhD						30	1080	140

The research experience under this phase of the international program may be gained at U.S. universities, international research institutes as CYMMIT, IRRI, or other public or private research units. Provisions are, also made for defraying the cost of researchers and administrators from the four centers, UPLB campus and PCAR for attending international seminars, workshops combined with short term observational study at key institutions within or outside the region. Table 12 provides more information in regards to special areas or discipline in which training is anticipated.

d. Equipment, Library Additions and Professional Journals

Approximately 28 percent of the loan proceeds will be used for offshore procurement of laboratory equipment and materials, field machinery, portable power units for laboratories, reference books, professional journals in the plant science field, etc. Annex K lists the most needed library materials and equipment at the four agricultural research centers with an estimated cost of each item. Also, the list contains some special equipment designated for the PCAR secretariat. This equipment, including communication items, reproduction equipment, computer software, etc., will improve communications, assist with and upgrade library services (making copies of professional journal articles requested by researchers from the Station Network) now in operation among the several research centers, and provide computer service in project funding, equipment inventories, data-bank service, to researchers and general research administrators. The equipment will contribute to the efficient management of national network of agriculture research operations. Throughout the world the depository of knowledge in libraries has proven to be of utmost importance in any educational or research endeavor. The availability of new upeto-date reference books and professional journals at the four agricultural research centers is totally inadequate for the purpose of instruction and research. As might be expected a list of books and journals would be varied because of the many disciplines involved in the investigations of rice, corn, sorghum, soybeans and other legumes and cropping systems. For example, textbooks and journals would be needed in the areas of: plant breeding, genetics, plant pathology, entomology, plant culture, statistics, economics, sociology, marketing, weed control, soil and water, irrigation, handling, storage and processing of grain, agricultural engineering, project design, plant physiology, bio-chemistry, food science, etc.

TABLE 12

International Training of Research and Administrative Staff

I. PhD Training Program (Three Years)	1	2	3	4	5	Total Number	Total Man/Months	Cost Dollars x 1000
1. Plant Physiology	1					1	36	30
2. Soil and Water	1					1	36	30
3. Food Processing & Handling		1				1	36	30
4. Ag. Economics	1		1			2	72	60
5. Statistics		1				1	36	30
6. Microbiology	1					1	36	30
7. Biochemistry		1				1	36	30
Total						8	288	240
II. Upgrading/Refresher for Staff (6-12 Months - Average 9 Mos.)								
1. Crop Improvement		1	1	1		3	27	30
2. Crop Prod. Management			1	1		2	18	20
3. Crop Protection		1		1	1	3	27	30
4. Crop Utilization		1		1		2	18	20
5. Economics	1		1			2	18	20
6. Rural Sociology			1		1	2	18	20
7. Soil & Water		1		1		2	18	20
8. Crop Physiology			1	1		2	18	20
9. Administration	1		1			2	18	20
Total						20	180	200
III. Scientific Conf. and Short Study/Observation 3-6 weeks								
1. Crop Improvement	2	2	2	1	1	8	8	16
2. Crop Prod. Mgt.	1	1	2	1	1	6	6	12
3. Crop Protection	1	2	2	1	2	8	8	16
4. Crop Utilization	1	2	2	1	2	8	8	16
5. Economics	1	2	1	1	2	7	7	14
6. Rural Sociology	1	1	1	2	0	5	5	10
7. Water & Soil	1	2	2	1	1	7	7	18
8. Crop Physiology	1	1	1	1	0	4	4	8
9. Administration	1	2	2	1	1	7	7	14
Total						60	60	120
Grand Total							528	560

e. Infrastructure

The largest share (45 percent) of the loan proceeds has been programmed to be used for physical infrastructure - research laboratories, service buildings, staff housing and site development including utilities. In Table 8 previously presented shows the total requirements in terms of pesos and/or dollars required to meet the building items determined as necessary for making the units fully functional as research centers. Also Table 13 list the infrastructure selected for funding at each of the centers.

As weill be noted in reviewing the infrastructure needs, over 26 percent of the requirements from the four centers for infrastructure is in staff housing. This is considered absolutely essential, given the present salary schedule to attract and retain qualified researchers at most of the outlying centers or satellite stations.

2. Estimated Cost of the Project

The program developed by the GOP for improvement of facilities and the expansion of a more efficient and effective research program at the four centers under consideration proposes expenditures of $1.937 and $8.670 millions respectively for research equipment and infrastructure over a five year period. A large proportion of the projected expenditure will occur during the first three years of the project, i.e. $1.70 and $5.00 millions for equipment and infrastructure respectively. The entire cost of operations including personnel salaries for the four centers which is projected to amount to about $11.5 million for the first five years will be borne by the GOP. Table 1 summarizes the total project costs at the four research centers for a five year period and the expected U.S. contributions as a percentage of the total costs. Table 2 summarizes the U.S. contributions by year, areas of support, local currency costs and foreign exchange cost. The U.S. portion of expenditures for the total program for the four centers will be approximately 26 and 60 percent for infrastructure and equipment, respectively. During the first three years (the period for which U.S. loan proceeds are programmed) the U.S. contribution will be 45 and 64 percent, respectively, for infrastructure and equipment.

An allocation of $250,000 is made for covering the foreign exchange cost of books, journals, equipment and materials for the scientific literature services of the Centers and PCAR. This service in addition to book, based largely on the libraries of UPLB, SEARCA and IRRI, is designed to provide personnel away from the Los Banos complex with a means of keeping up

TABLE 13

Infrastructure Selected for Funding at the Four Agricultural Research Center (Cont'd)

	AREA M^2	PCAR ESTIMATE TOTAL COST	USAID ESTIMATE UNIT COST, $	USAID ESTIMATE TOTAL COST, $
Mindanao Institute of Technology				
1. 1 Crop Research Laboratory (2 stories)	1,976	230,000	200	395,200
2. 2 Greenhouses	432	20,000	114	49,200
3. 1 Screenhouse	216	9,500	50	10,800
4. 1 Grain Processing Building	400	40,000*	114	45,600
5. 1 Grain Storage Building	200	10,000*	64	21,000
6. 1 Seed Room-Air controlled	150	10,000*	79	11,900
7. 1 Insectarium	120	8,000*	79	9,500
8. 1 Pathologium	120	8,000*	79	9,500
9. 2 Field Buildings	480	36,500	93	44,600
10. 10 Duplex Staff Houses	1,600	160,000	114	182,400
11. Site Development-Exp. Farm	60 has.	50,000	0.10	60,000
12. Site Development-Utilities	30 has.	25,000	0.12	36,000
Sub-Total, So. Mindanao Center		607,000		867,500
(PCAR Estimate)		2,240,000		
TOTAL COST				2,730,700
Excalation (15%)				409,605
Contingencies (10%)				273,070
GRAND TOTAL (USAID ESTIMATE)				3,413,375
Amount to be financed by USAID[1]		2,240,000		

* No plans - areas approximate only.

1 Other project cost savings may be applied to infrastructure development up to but not exceeding 75% of the total USAID accepted cost estimate.

TABLE 13

Infrastructure Selected for Funding at the Four Agricultural Research Center

	AREA M^2	PCAR ESTIMATE TOTAL COST	USAID ESTIMATE UNIT COST, $	USAID ESTIMATE TOTAL COST
Central Luzon State University				
1. 1 Crop Research Laboratory (1-storey)	1,120	$ 240,000	171	191,[illegible]
2. 10 Duplex Staff Houses	1,600	160,000	100	160,000
3. Site Development- Exp. Farm	50 has.	25,000	0.05	[illegible],000
Maligayan Rice & Training Center				
1. Greenhouse	216	10,000	100	[illegible],600
2. 2 Duplex Staff Houses	320	32,000	100	[illegible]
Sub-Total, Central Luzon Center		467,000		430,100
Bicol Rice & Corn Experimental Station				
1. 1 Crop Research Laboratory (2 stories)	1,976	240,000*	186	367,[illegible]
2. 1 Greenhouse	216	22,000*	107	[illegible]
3. 1 Screenhouse	216	9,500*	44	[illegible]
4. 4 Duplex Staff Houses	640	64,000*	107	68,500
5. Site Development-Exp. Farm	50 has.	25,000*	0.07	[illegible]
Camarines Sur Agricultural College				
1. 1 Soil & Water Research Center	920	160,000	129	118,[illegible]
2. 4 Duplex Staff Houses	640	64,000	107	[illegible]
3. Site Development-Exp. Farm	50 has.	25,000	0.07	[illegible]
Sub-Total, Bicol Center		609,500		725,[illegible]
La Granja Experimental Station				
1. 1 Crop Research Laboratory (2 stories)	1,976	240,000	186	367,[illegible]
2. 1 Greenhouse	216	22,000	107	[illegible]
3. 1 Screenhouse	216	9,500	44	[illegible]
4. 1 Service Building	800	75,000	100	80,[illegible]
5. 10 Duplex Staff Houses	1,600	160,000	107	171,[illegible]
6. Site Development-Water Supply	30 has.*	20,000	0.07	21,000
7. Site Development-Exp. Farm	50 has.*	30,000	0.07	35,000
Sub-Total, La Granja Center		556,500		707,300

* Areas adopted from other centers.

with the more important work being published and to provide direct access to publication of special relevance to their particular research.

The U.S. loan funds will cover all costs (approximately $560,000) for foreign training. A U.S. contribution to the PCAR scholarship fund of approximately $440,000 will provide for about 290 man years of training in local institutions, principally UPLB, or 44 percent of the projected degree training to be financed under the loan. At the present time the GOP through various agency scholarship funds is providing scholarships for 95 man years of training per year (1974-75) of which 59 are provided by the PCAR scholarship fund. Other sources of support for training in local institutions are provided by SEARCA and the American Development Council (ADC).

Technical advisory services for the project to be provided by the AID loan will cost approximately $303,000 or approximately 7 man years service covering administrative and specialist in a number of discipline.

Approximately 45 percent of the U.S. input will represent foreign exchange costs.

3. Project Implementation

a. General

The project will be implemented within the framework of the existing Philippine institutional structure under the leadership and direction of the Philippine Council for Agricultural Research (PCAR). The director general of PCAR will be the project leader and will provide operational direction to the project. Policy and technical direction will be provided through the PCAR organization with the Governing Council providing broad policy direction and setting priorities and commodity discipline research teams for establishing priorities and technical research leadership within given commodities or disciplines.

The Governing Council, chaired by the Chairman of the National Science Development Board (NSDB) with the Secretary of Agriculture as Vice-Chairman, assures a close linkage between agricultural research and the National Science structure. The presence on the Council of a representative from the National Economic and Development Authority (NEDA) and the Budget Commission insures relevance to national development goals.

The formulation of commodity/discipline research priorities and programs is the responsibility of

research teams composed of key scientific personnel from the several government, educational, and private entities, working under the direction and leadership of one of the PCAR directors. Cross commodity/discipline problems are dealt with by joint study and discussion among the concerned members.

The proposals and recommendations of the commodity teams, after synthesis by the PCAR Secretariat, are reviewed by the PCAR Technical Program Planning and Review Board. The latter makes recommendations to the Governing Council.

All research projects in agriculture financed from public funds are reviewed on an annual basis (see portion on evaluation). The Budget Commission allocates funds for projects approved by PCAR.

In addition to exercising control over public financing of research, PCAR has special budget allocations it administers directly in support of research through grants-in-aid for specific research projects and a scholarship fund for manpower development. These mechanisms provide PCAR effective tools for exercising direction over the entire network as well as a considerable control over operations.

The allocation of loan funds will be administered by PCAR within limitations established in the approved budget plan. The research activities will be manned by Philippine personnel with advice from U.S. technical personnel. All operational costs of the research program will be covered by GOP budgets either through the Departments of Agriculture and Natural Resources agency budgets, commodity institutes, colleges, private centers within the PCAR network, or through PCAR administered budgets.

The AID loan financed project is programmed to have a life span of five years. However, the allocations for infrastructure development and commodity procurement are expected to be fully utilized within the first three years. It was the consensus of PCAR, the Mission and the consultants that the manpower development program and the technical services aspect of the project would be most useful to progress and effectiveness of the proposal using a five-year period. Most of the manpower development program is for graduate study at the M.S. and PhD levels requiring two to three years of study. Also, much less stress and pressure will occur on the graduate school at UPLB and on the four research centers in an effort to maintain quality and the program underway if a five-year period is utilized. There appears to be no problem in making effective use of infrastructure type input in this program during a three-year period.

b. Technical Assistance

The assignment of a USAID direct hire Agricultural Project Manager (Research) is the first priority upon the activation of a possible loan. This input would be effective in determining short-time consultant needs and availability, assist with programming international training needs, provide assistance in preparing commodity needs, provide assistnace in preparing lists especially library additions, etc.

While it may be possible for PCAR to recruit directly the specialists and short-term consultants, PCAR may find it advantageous to contract with some university, university consortium or non-profit entity such as Institute of International Education (IIE) to recruit, hire, and among other things provide for continuation of fringe benefits as retirement, insurance, etc. or handle travel arrangements. In any event, it is anticipated that all such advisors will be directly contracted to the PCAR rather than the USAID Mission. The Mission will be available to provide suggestions on possible contracting units, available, staff, etc., from the available network in the U.S. or around the world.

c. Manpower Training

(1) Local Training. The funds will be made available to PCAR for granting scholarship for study in local institutions (UPLB chiefly) at the M.S. and Ph.D. level in various fields and/or discipline. With notable personnel gaps and relative to the needs of the basic food and feed crops research at the four centers, PCAR will phase the degree work best suited to programs in operation, select recipients, and prepare needed materials for acceptance to the UPLB graduate schools. Inasmuch as local training costs are strictly local currency in nature, it is planned to provide the requested assistance on an after-the-fact reimbursement basis by means of crediting a dollar Special Letter of Credit (SLC) on the U.S. for procurement of U.S. commodities. To assure adequate control and proper expenditure of funds, it is proposed that the GOP/PCAR advance funds for the scholarships that are agreed upon in regard to number and amount. Upon certification by the graduate schools involved of satisfactory completion of an academic year the SLC can be credited accordingly.

(2) Offshore Training. Degree training in foreign institutions will be limited to fields or disciplines of critical shortage and for which local training facilities are also limited (crop physiology, soils and water management, macro-economics, statistics, and food science) and will be limited to the PhD and post-graduate levels. Such training will be planned so as to reduce the time in a foreign institution to a minimum and provide that thesis research and other research be conducted on problems of immediate importance to Philippine agriculture especially on the food and feedgrain crops. It is envisioned that the post-graduate or refresher type training can take place at universities and/or other research units as CYMMIT or private research institutes. In the selection of recipients for this phase of training the research and teaching profesors at UPLB will be given full consideration. It is vital to the project that the high quality and capable faculty of UPLB be enhanced since the bulk of graduate degree training for the four research centers will be handled at this higher educational unit in the Philippines.

Most of the external training will be on a short-term basis (less than one month to twelve months) for technical upgrading and for broadening personnel perspectives. Standard AID PIO/P financing and disbursement procedures will be utilized for off-shore training activities.

d. Commodity Procurement

The procurement of offshore commodities will be accomplished in accordance with AID Capital Project Guidelines. The capability of the local Education Project Implementation Task Force (EDPITAF) has been investigated in regard to commodity procurement and it has the abilities and background to handle this task under the project in accordance with AID capital project regulations. This entity was established specifically for procurement of educational materials under the International Bank for Reconstruction and Development (IBRD) loan (approximately $35 million in three phases) for development of college level education.

As an alternative the GOP could consider a contractual arrangement with some U.S. entity to carry out the procurement as a university or IIE. Commodity procurement will be limited to the U.S. and AID Code 941 countries. No procurement of local commodities with loan proceeds is contemplated. Standard AID Letter of

Commitment (L/Com) financing procedures will be utilized for offshore commodity procurement.

e. Infrastructure Construction

Local construction of buildings, land development and improvements, water and power systems will be financed, shown in Table 2 on a fixed cost reimbursable basis by means of a tied dollar SLC in the U.S. Reimbursement of construction cost will be made only for completed and accepted structures for which prior agreement has been readied as to adequacy of design and cost estimates. In no case shall AID reimbursement exceed 75 percent of the previously agreed total construction costs.

The implementation of design and construction of the infrastructure portion of this program is pictorially shown in the accompanying time-frame PERT chart shown as Table 14. As can be seen, all infrastructure components of this project are scheduled for completion within the AID policy time limit of 3 years. Only the participant training and consultative services will extend beyond the 3-year period for an additional 2 years.

The infrastructural work essentially may be divided into four elements and will be implemented as follows:

(1) PCAR will provide independent monitoring of engineering design, specifications and construction satisfactory to AID using either a prviate sector A/E firm or by negotiation of an agreement with the Educational Development and Planning Implementation Task Force (EDPITAF). EDPITAF is an agency under the Department of Education and Culture having previous experience with bid preparation and procurement of laboratory equipment and is considered by USAID to be qualified to undertake procurement of equipment, books, journals and to provide technical engineering service for construction monitoring. The use of either an A/E firm on EDPITAF is considered satisfactory to AID and should provide necessary management, fiscal and technical controls for administration of the fixed amount reimbursement (FAR) procedure. It also will be the responsibility of this A/E or EDPITAF to assist PCAR in preparation of the request for proposals (RFP) for the A/E design contract.

(2) Design of buildings and structures is expected to be carried out through a contract with a private sector A/E firm.

(3) In most cases, construction of buildings will be undertaken by competitive contracts. However, if PCAR can demonstrate that force account construction is more advantageous for some elements of work, force account construction will be permitted. When force account construction is utilized, a more stringent set of monitoring controls will be enforced.

(4) Designs for farms development will be accomplished by PCAR with the assistance of other GOP agencies (NIA, FSDC, EDPITAF, etc) and/or private engineering firms. Construction will be by force account and/or competitive construction contracting. In all cases, monitoring will be carried out as described in sup-para (1) above.

f. Contract and Contractor Approvals

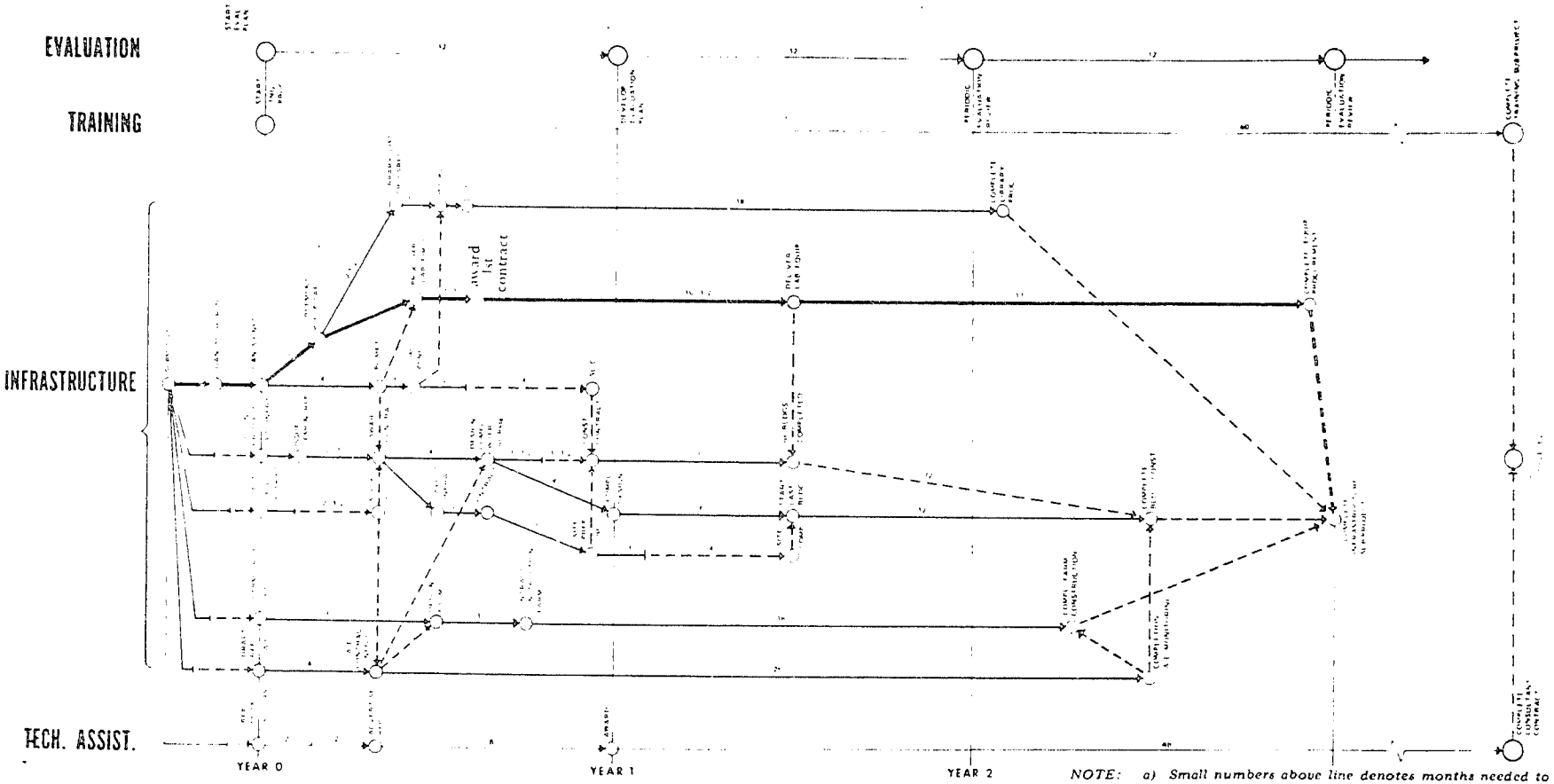
All professional and construction service contracts and contractors, whether under the FAR procedure or direct actual cost reimbursement, will be approved by USAID pursuant to AID legislative requirements (Section 105).

g. Conditions Precedent:

It is the Loan committee's opinion that the GOP 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 signatures of Borrowers representatives, etc.) the following in form and substance satisfactory to AID prior to the initial disbursement of loan proceeds:

1. A project implementation plan including a detailed flowchart for the life of the project prepared by PCAR, including a projection of funds available to finance the various elements of the project as well as the annual operating budgets of the Research Center.

2. Written assurance from the Borrower that sufficient funds will be made available to PCAR pursuant to (1) above in order to assure timely and orderly implementation project.



TIME FRAME PERT
Table 14

NOTE: *a) Small numbers above line denotes months needed to accomplish activity.*
b) Critical path indicated by heavy line.

4. Evaluation

PCAR has developed a system, including formats for monitoring progress and evaluation of research projects on an annual basis. This evaluation is scheduled so that all projects are evaluated just before budget recommendations are made for the next fiscal year.

Evaluation is carried out by a team consisting of the PCAR Research Director of the commodity/discipline concerned or the commodity/team leader, the program specialist and one or more representatives of the implementing and/or funding agency. The evaluation is made on the spot with participation of research station personnel as may be appropriate.

The projects are evaluated with respect to: (a) technical performance in terms of work schedules and contribution to project purpose, (b) financial and administrative aspects and (c) project priority and continuing relevance to research goals. The review team may make recommendations for changes in approach, termination, continuation expansion or reduction in scope.

This system of evaluation is believed to be adequate for AID purposes insofar as it evaluates actual performance of research undertakings. USAID through the project manager will check on the system. For purposes of evaluating performance in the development of research facilities and procurement of equipment and materials, the records of procurement and delivery will provide a basis for evaluation of performance against a predetermined schedule. Since construction of facilities will be financed through reimbursement for completed structures and/or installations, the requirements for evaluation will be minimal.

With respect to the training component, the records of student performance from the Graduate Dean's Office of the training university and subsequent assignment will provide an adequate base for evaluation.

A logical framework outline has been prepared for the the project to assist in evaluation.

As a means of evaluating the new technology transmittal system grant assistance will be requested during the first year of the project to establish a baseline study. Criteria for evaluating selected research will be established as to how the technology reaches the farmer and why he does or does not use this information. It is expected that the same

study could be repeated during the fifth and final year of the loan to determine if procedures for transmitting technology to small farmers with the appropriate reverse communication, have improved or are in other ways adequately reaching the small farmer.

5. The PCAR Research Monitoring Mechanism Guidelines

A uniform mechanism to follow up the progress of ongoing research projects/programs is a must in any efficient research system. The following guidelines have been formulated for the guidance of all concerned relative to the standard procedures of the PCAR Research Monitoring Mechanism.

a. Up-dating of all On-Going Projects

(1) Progress reports on all on-going projects shall be submitted not later than October 15 of each year. A report must consider, among other things, title and location of the project, the accomplishment and financial status of the project, problems encountered, and recommendation in relation to problems encountered.

(2) Annual reports shall also be submitted not later than May 31 of each year. In addition to data required in the semi-annual report, these shall also contain abstracts or highlights of the research results, as well as requests for extension of the projects together with the financial requirement for the ensuing fiscal year or part thereof, as the case may be.

(3) Terminal report shall be submitted to PCAR not later than <u>two months</u> after completion of the experiment/study.

(4) New research proposals shall be submitted not later than December 20 of each year in order to qualify for possible inclusion in the ensuing fiscal year's budget.

b. Field Visitation of the Research Projects by PCAR Evaluation Team

(1) Bureau and agency heads shall be informed of the schedule of field/laboratory evaluation of on-going projects at least two weeks in advance and they shall also designate their representative(s) to the PCAR Evaluation Team.

(2) Actual field visits, by the Evaluation Teams will complement the progress reports submitted. These will verify the status of the projects.

(3) An Evaluation Team is composed of the (a) Research Director concerned and/or the Commodity Research Team Leader, (b) the Program/Specialist and (c) representative(s) of the implementing and/or funding agency, preferably a team member. Thus, an evaluation team is composed of at least three members. The agency shall shoulder the expenses of its representatives in the team.

(4) All field evaluation shall be completed on or before November 30 of each year.

(5) The Standard Evaluation Format shall be used for uniformity and easier collation of evaluation data.

c. Points to be Evaluated

Using the corresponding PARS Form No. 1 (Research Proposal) of on-going projects, the following shall be verified.

(1) Competence of the research leader or proponent to undertake the project.

(2) Correctness of the experimental design and methodology. If design is not appropriate considering topography, vegetation, exposure, etc. determine how it would be corrected to enable experiment to give desired information.

(3) Progress versus the timetable indicated in the approved project proposal.

(4) Actual financial support received by project versus approved project budget.

(5) Adequacy of supplies, materials, equipment versus project timetable of operations.

(6) Raw data keeping, frequency of data collection, etc.

(7) Problems/difficulties, if any, encountered in project implementation.

(8) For inaccessible projects, examine evidence of existence of actual research such as (a) establishment reports, (b) data so far gathered, (c) evidence of expenditures.

(9) Determine what remains to be done in such projects as guide in ascertaining future plan for the project.

d. Submission of Evaluation Report

(1) Within a week after completion of field evaluation, the evaluation team shall submit its report to the Research Division Director concerned with a copy furnished to the Office of the Director General.

(2) The Research Director and Commodity Research Team Leader concerned shall evaluate the field reports, and submit to the PCAR Director General the required recommendations.

(3) All project recommendations shall be in the hands of the Director General not later than December 20 of each year.

e. Recommendations After the Evaluation

(1) Continuance of the project if found to be according to the project plan.

(2) Modification of the project design to improve the chances of obtaining more significant and useful information.

(3) Modification in the project budget i.e. downward or upward depending on its optimum requirement.

(4) Transferring the project to another place or agency. Lack of competent personnel and.or adequate facilities for the proper implementation of the project could lead to this action.

(5) Termination of the research project if found to be out of the research program, or of low priority, or a duplication of other researchers.

ANNEX B

Department of State

AMEMB MANILA

ACTION: AID-8

UNCLASSIFIED
Classification

JAN. 24, 1975
4:25 AM

INFO:
AMB
MIN
DCM
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P 241748Z JAN 75
FM SECSTATE WASHDC
TO AMEMBASSY MANILA PRIORITY 2748
BT
UNCLAS STATE 016088

AIDAC

E.O. 11652: N/A
TAGS:
SUBJECT: PROPOSED AGRICULTURE RESEARCH LOAN
REF: MANILA 0465

1. EAPAC MET, CONSIDERED AND APPROVED PRP FOR PROPOSED SUBJECT LOAN JAN. [illegible], 1975. ISSUES RAISED WHICH SHOULD BE ADDRESSED IN PROJECT PAPER (PP) ARE DISCUSSED BELOW. FYI, AD/AD SHEPPARD AND ASS'T P.O. BAUM ATTENDED MEETING.

2. ISSUES FOR INTENSIVE REVIEW INCLUDE:

(A) LOG FRAME: SHOULD BE IMPROVED TO MORE CLEARLY SHOW LINKAGES BETWEEN OUTPUTS-PURPOSE-GOAL. SPECIFICALLY [illegible] SHOULD CLEARLY SEE THE LINK BETWEEN THE IMPROVEMENT OF INSTITUTIONAL RESEARCH CAPABILITY AND THE GOAL OF SELF-SUFFICIENCY IN FOOD CROPS. ALSO GOAL AND PROJECT PURPOSE LEVEL INDICATORS SHOULD BE QUANTIFIED WHEREVER POSSIBLE, AS STATED IN PRP, WHICH STABLE SUPPLY UNQUOTE AND [illegible] MINIMAL IMPORTS UNQUOTE BASICALLY SUBJECTIVE. ADDITIONAL COMMENTS MAILED AD/CD DANGLER. See Annex C.

(B) CONGRESSIONAL MANDATE: PP NEEDS TO SHOW HOW RESULTS OF RESEARCH WILL REACH AND ESPECIALLY BENEFIT SMALL FARMERS, RECOGNIZING FACT THAT THERE IS A TIME LAG BETWEEN RESEARCH AND FARMER ACCEPTANCE AND USE. PROJECT PAPER SHOULD SHOW HOW BENEFITS WILL ACCRUE TO SMALL FARMERS AND THAT THERE ARE IDENTIFIABLE INDICATORS ASSURING THAT SUCH WILL OCCUR. BENEFICIARIES DO NOT RPT NOT INCLUDE TECHNICIANS OR PCAR AS AN INSTITUTION. THESE ARE IN FACT DEVELOPMENT INTERMEDIARIES. See Page 36.

(C) CONSISTENT WITH (B) ABOVE, PP SHOULD INCLUDE A WELL DEVELOPED PROFILE OF THE TARGET BENEFICIARIES AND THE

UNCLASSIFIED
Classification

FORM FS-412(B) 4-68

PCAR OUTREACH PROGRAM TO THESE BENEFICIARIESM THIS WOULD INCLUDE SMALL FARM FIELD TRIALS UNDER REALISTIC CONDITIONS TO PROVE BENEFITS. See Page 37.

(D) PP SHOULD DETAIL COST OF THE PROJECT INCLUDING GOP INPUT, FOREIGN EXCHANGE AND PORTION INCLUDED IN FAR. REGARDING LAST, PP SHOULD SHOW DETAILED MISSION PLANS AND ESTIMATES OF FOREX AND LOCAL CURRENCY BREAKDOWN OF CONSTRUCTION SERVICES AND RELATED EQUIPMENT AND MATERIALS AND FOR FACILITY INSPECTIONS AND REIMBURSEMENT APPROVAL. BREAK DOWN SPECIFICS FOR FOUR PROJECT SITES. See Pages 55-63.

(E) GOP COMMITMENT NEEDS TO BE DETAILED INCLUDING BUDGETARY IMPACT OF BOTH MAINTENANCE AND SALARY COST INCREASES AS A RESULT OF THE PROGRAM. IMPLICATIONS OF PROBABLE FUTURE SCIENTIFIC SALARY INCREASES (TO ATTRACT AND HOLD PERSONNEL) SHOULD BE FULLY EXPLORED WITH GOP. See Page 41.

(F) NEED A CLARIFICATION OF WHO IS CONTROLLING AGRICULTURE RESEARCH FUNDS AND HOW PCAR ACTIVITIES ARE COORDINATED WITH OTHER AGENCIES AND COMPLEMENT OTHER RESEARCH ACTIVITIES. See Page 12.

(G) REGARDING PHYSICAL PLANT CONSTRUCTION, NEED ANALYSIS PROGRAM-ORIENTED UTILIZATION EXISTING RESEARCH FACILITIES, INSPECTION PLANS AND 611(A) DETERMINATION, LAND PLANNING AND THE ECOLOGICAL/ENVIRONMENTAL IMPACT OF SUCH CONSTRUCTION. See Annex F and Pages 23-27.

(H) NEED OVERALL ENVIRONMENTAL IMPACT ASSESSMENT REGARDING AGRICULTURE RESEARCH. AT A MINIMUM, THIS STATEMENT SHOULD SHOW THAT ISSUES ON THE ENVIRONMENT WERE ASSESSED ACCORDING TO THE AGENCY ENVIRONMENTAL ASSESSMENT GUIDELINES MANUAL. IF THERE ARE SPECIFIC QUESTIONS AND CLARIFICATIONS AID/W WILL BE PREPARED TO OFFER SUGGESTIONS AND ASSISTANCE. SEE M.C. 1214.1. See Annex F.

(I) NEED NARRATIVE OF LOG FRAME WITH SUPPORTING EVIDENCE IN PP BODY ANY ASSUMPTIONS MADE. LOG FRAME INDICATORS AND EVALUATION PLAN SHOULD BE CONSISTENT. See Page 5.

3. AID/W FORSEES NO PROBLEM WITH FIVE YEAR DISBURSEMENT PERIOD WHICH MUST BE JUSTIFIED IN PP, AND FINANCING OF LOCAL SCHOLARSHIPS. HOWEVER, THERE ARE STILL QUESTIONS ON HOW BOTH SHOULD AND CAN BE JUSTIFIED. MISSION SHOULD DISCUSS WITH A. HANDLEY, PPC/DPRE DURING MANILA TDY. KISSINGER

PS:

AID 1020-28 (11-73)

PROJECT DESIGN SUMMARY
LOGICAL FRAMEWORK

Life of Project:
From FY 1975 to FY 1990
Total U. S. Funding $5 Million
Date Prepared: December 19, 1974

Project Title & Number: Agricultural Research

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Program or Sector Goal: The broader objective to which this project contributes: (A-1) Contribute to increasing the income of small farmers, national self-sufficiency in rice, corn, sorghum, soybeans and other legumes, and improved national nutritional levels.	Measures of Goal Achievement: (A-2) 1. Imports of food and feed grains reduced by 25% of the 1970-75 average by 1990. 2. Stable supply and price of food and feed grains. 3. Calorie consumption above the minimum acceptable levels. 4. A 30% increase in the real income of small farmers by 1982. 5. 90% of the corn and sorghum used in locally manufactured feeds will be produced locally by 1980.	(A-3) 1. GOP data on imports, production, consumption, price and income 2. Supplemental data from other sources available.	Assumptions for achieving goal targets: (A-4) 1. That the GOP will maintain policies favorable to the application of new production technology (e.g. policies on pricing, credit, etc.), and that complementary services and programs will be adequately available (e.g. extension services, agrarian reform, transportation, irrigation, etc.). 2. That the research centers will be able to provide the technology required, and that the progress of the research stream will not be constrained by lack of adequate budget, management, personnel, etc. 3. That small farmers will find new Technology profitable to use.
Project Purpose: (B-1) To improve the research capability of the La Granja, Southern Mindanao, Bicol and Central Luzon agricultural research centers to provide a continuous stream of information and technological improvements for the production of rice, corn, sorghum, soybeans, other legumes and other food and feed crops which may become important in the future.	Conditions that will indicate purpose has been achieved: End-of-Project status. (B-2) 1. The four research centers performing the required research in the quantity and quality necessary. 2. Improved technology being introduced into the production of food and feed grains on a regular, continuing basis. 3. An increased capability for graduate training in agriculture at universities and colleges. 4. Other research centers producing more and better research as a result of interaction with the four assisted centers.	(B-3) 1. Research results and reports on research published by the Centers and related organizations. 2. Reports on extension services, GOP data on planning, use of inputs, production, incomes, etc. 3. Data from universities and colleges on enrollment, subjects offered, quantity and quality of faculty, etc.	Assumptions for achieving purpose: (B-4) 1. That the resources provided will be sufficient to adequately staff and equip the centers so that they are in an unconstrained position to undertake a research program. 2. That the crops to be researched are not downgraded in importance or that self-sufficiency (or, minimally, significantly increased crop production) is not abandoned or displaced as a national goal.
Project Outputs: (C-1) 1. Consolidation of PCAR as the GOP agency for developing, coordinating, programming, and evaluating research policy and programs in agriculture. 2. The four centers adequately staffed and equipped to make maximum utilization of latest technical information and research methodology, and carrying out well-planned research programs and projects on basic food and feed crops. 3. An information system for PCAR in cooperation with UPLB, SEARCA, and IRRI libraries to provide timely access to key scientific literature for researchers at the various centers. 4. Improved quantity and quality of output in related organizations, such as other research centers and training institutions.	Magnitude of Outputs: (C-2) 1. PCAR managing and administering at least 50 percent of GOP budget resources devoted to agricultural research by 1977, and at least 75 percent by 1980. 2. Annual PCAR publications explaining ongoing and completed research, and detailed evaluation of completed research results. 3. Research projects aimed at various aspects of increasing production of all basic food and feed crops underway by 1976, and continuing during life of the project, with research reports published on a regular basis.	(C-3) 1. PCAR records and reports. 2. Various research center's records and reports.	Assumptions for achieving outputs: (C-4) 1. That the GOP supports PCAR as the agency to develop, coordinate, program, and evaluate research policy and programs in agriculture. 2. That the research centers and other institutions have sufficient budget to undertake the necessary programs.
Project Inputs: (D-1) U.S. Inputs A. Advisory Services short term B. Equipment and Machinery C. Library books, journals, and materials D. Physical facilities E. Training MS Local institutions PhD local institutions PhD external institutions Non degree short term	Implementation Target (Type and Quantity) (D-2) Target schedule ($1000) 1975-76: 40, 121, 50, 140 1976-77: 68, 236, 150, 1000 1977-78: 95, 292, 50, 1100 1978-79: 65, 237 1979-80: 35, 114 Numbers in Training (man years) 1975-76: 15, 12, 3, 12 1976-77: 50, 20, 6, 14 1977-78: 50, 35, 8, 21 1978-79: 50, 20, 5, 15 1979-80: 25, 10, 2, 12	(D-3) 1. USAID or PCAR records.	Assumptions for providing inputs: (D-4) 1. That loan funds will be available, and other factors such as conditions precedent can be met. 2. That costs of equipment, machinery, construction, etc., remain reasonable. 3. That suitable sources for the advisory services can be identified.

Annex D

U.S. AGENCY FOR INTERNATIONAL DEVELOPMENT
Manila, Philippines

Ramon Magsaysay Center
1680 Roxas Boulevard

Telephone: 59-80-11

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

I, THOMAS C. NIBLOCK, the principal officer of the Agency for International Development in the Philippines, having taken into account, among other things, the maintenance and utilization of 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 capability and the human resources capability to effectively maintain and utilize the proposed Agricultural Research Loan.

This judgment is based upon the project analysis as detailed in Agricultural Research Project Paper and is subject to the conditions imposed therein.

Thomas C. Niblock, Director
USAID/Philippines

7 March 1975
Date

Annex E

Loan No. 492-

CAPITAL ASSISTANCE LOAN AUTHORIZATION

Provided from: Food and Nutrition
(Philippines: Agricultural Research Loan)

Pursuant to the authority vested in me as Assistant Administrator, Bureau for East Asia, Agency for International Develop ("A.I.D."), by the Foreign Assistance Act of 1961, as amended, (the "Act") and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter I, Section 103 and Chapter 2, Title I the Development Loan Fund, to the Government of the Republic of the Philippines ("Borrower") acting through the Philippine Council for Agricultural Research ("PCAR") of not to exceed Five Million Dollars ($5,000,000). The proceeds of this loan will be used to assist in improving the capability for agricultural research at four selected Research Centers by providing, in part, facilities, laboratory and field equipment and funds for manpower development. The loan shall be subject to the following terms and conditions:

1. Interest Rate and Terms of Repayments

The loan shall be repaid by the Borrower within forty (40) years after the date of the first disbursement under the loan, including a grace period of not to exceed ten (10) years. The interest on the unrepaid principal balance of the loan shall be from the date of first disbursement at the rate of (a) two percent (2%) per annum during the grace period, and (b) three percent (3%) per annum thereafter.

2. Currency of Repayment

Provision shall be made for repayment of the loan and payment of interest in United States dollars.

3. Other Terms and Conditions

Unless A.I.D. otherwise agrees in writing,

(a) Goods and services financed under the loan shall have their source and origin in the Philippines or in countries included in A.I.D. Geographic Code 941 (Selected Free World).

Annex E - Cont'd

(b) The loan agreement shall provide that prior to the disbursement of loan proceeds, the Borrower shall submit or cause to be submitted, the following in form and substance satisfactory to A.I.D.

(1) A project implementation plan for the life of the project prepared by PCAR, including a projection of funds available to finance the various elements of the project as well as the annual operating budgets of the Research Centers.

(2) Written assurance from the Borrower that sufficient funds will be made available to PCAR pursuant to (1) above in order to assure timely and orderly implementation of the project.

(3) A copy of an executed contract or contracts with a local engineering firm or firms to review plans and specifications and to monitor construction satisfactory to A.I.D.

(4) Such other conditions as A.I.D. may deem advisable.

_____

Arthur Gardiner
Assistant Administrator for East Asia
AID/Washington

_____

Date

Annex F

ENVIRONMENT IMPACT STATEMENT

In accordance with M.C 1214.1 20 September 1971, an appraisal of the environmental implications of this project follows:

Project Description:

To develop and improve the research capability of the Government of the Philippines (GOP), the proposed U.S. five million dollar loan provides for additional facilities and equipment for four research centers plus the development of the required manpower. The contribution of AID resources through the Philippine Council for Agricultural Research (PCAR) will strengthen direction, coordination, programming and management of research. The strengthening of the institutional capability made possible by this project, will greatly enhance the ability of the GOP to focus on the development and dissemination of improved production technology and corresponding improvements in services to the small farmer, making it possible for more widespread use of production increasing practices.

Project Components	Approximate Cost from loan funds ($000)
Rehabilitation 4 existing agriculture research stations, including infrastructure, buildings and land development.	2,240
Research equipment, farm equipment, machinery and vehicles.	1,160
Library, books, journals, films, materials, etc.	250
Training and Manpower development 38 Academic for PhD 100 Academic for M.S. 20 Upgrading refreshers Training 60 Participation in scientific conferences and short term observation	1,000
Technical Advisors (Short term)	303
TOTAL	5,000

Environmental Impact

The impact of the physical facility will likely be neutral to mildly positive. The four agricultural research centers selected to participate in the proposed AID agriculture loan are all located at developed or active research and teaching units so no completely separate or new research centers will be established. It is chiefly additions to existing operations.

Annex F (Cont'd)

It is assumed few, if any, trees or shrubs will be destroyed or other problems as pollution will be increased by the proposed infrastructure additions, and there appears little likelihood that environmental quality of the four will be adversely affected. In fact, the new laboratory building will replace some building now in very poor condition and they add little to the appearance of the present campuses. Also, the replacement of some of the present housing around the units with new modern duplex houses should add to the building and ground aspect of enhancing the beauty and landscape of the area. Improvement in water supply, irrigation changes, drainage, and electrical service will not detract but should offer several advantages to the communities in terms of sanitation and other possible health hazards. As several of the centers, equipment is being purchased that will be used to make continuous checks on residues resulting from spray programs being carried out under proposed research programs.

The impact of the research to be stimulated will be strongly positive, i.e. the research will in almost all aspects contribute to improvement of the environment. This positive influence will be manifested in several ways. One, it will help get more production per unit of land. This will enable the Philippines to achieve adequate production from level, high quality land, marginal lands will not have to be used for basic food crop production, and thus can remain in forests or grass, both uses for which it is suited. Two, the research will contribute to the reduced use of chemicals for agricultural production. This will occur in several ways. One way is though the more efficient use of fertilizers, such as phosphorous and potassium, perhaps almost doubling efficiency of use. Some of this work is already underway. Another way to reduce the quantity of chemical nitrogen fertilizer by increasing the use of biological nitrogen. Chemical use will also be reduced by genetic improvement of crops to breed insect and disease resistance and by cultural practices to help achieve weed control. Three, agricultural research will help prolong the life of irrigated land. Irrigation almost always results in some accumulation of salt in the soil. This build up is accelerated if too much water is used and if there is improper drainage. Soil and water management research will provide the technology that will help prevent this destruction.

Equipment, technical assistance, and library additions which is not expected to relate to any particular physical environmental deterioration. On the other hand, the social or human living or working environment will be greatly enhanced by the inputs anticipated.

Through the PCAR all of the agricultural research in the Philippines is carefully coordinated as research projects are designed and evaluated. PCAR will study the environmental impact of all research proposals giving cognizance to long and short time efforts. (See attached letter of PCAR Director General).

Conclusion

There are no adverse environmental impact to be expected of this project.

Attach to Annex F

Republic of the Philippines
PHILIPPINE COUNCIL FOR AGRICULTURAL RESEARCH
Los Baños, Laguna, Philippines
Tel. Nos. 2308, 2375 & 2269

24 April 1975

Dr. Frank Sheppard
Assistant Director for
Agricultural Development
USAID
Magsaysay Center Bldg.
Roxas Blvd., Manila

Dear Dr. Sheppard:

Relative to USAID's concern about the environment, I wish to state that the environmental aspects will continue to be given due consideration in the planning and implementation of PCAR's research in agriculture, forestry and fishery.

The membership and/or participation of some of the members of our staff as well as the national commodity research planning and implementation teams, in the "Man and the Biosphere" organization is reinforcing PCAR's hand in this direction.

Very truly yours,

J. C. Madamba

JOSEPH C. MADAMBA
Director General

Annex G

National Network of Agricultural Research Centers and Cooperating Stations of PCAR

Map Number	Name and Location Agricultural Research Centers	Main Station for	Cooperating Station for
1	National Agricultural Research Center, Los Banos, Laguna	Abaca, Fruit, Oils & Spcies, Rice, Vegetables, Horticulture, Dairy, Forestry, Wildlife, Soil, Water, R. Sociology, Macro-Econ.	Cacao, Tea, Coffee, Coconut, Corn, Cotton, Forage/Pasture, Root Crops, Sorghum, Soybeans, Sugarcane, Tabacco, Poultry, Swine.
2	Cagayan Valley Agricultural Research Center, Echague, Isabela	Tobacco	Corn, Cotton, Oils & Spices, Rice, Sorghum, Soybeans, Soil & Water.
3	Central Luzon Agricultural Research Center, Munoz, Nueva Ecija	Cotton and other fiber crops and sericulture	Forage/Pasture, Oils & Spices, Rice, Vegetable, Beef, Dairy, Poultry, Swine, I. Fisheries, Water, Rural Socio-Econ.
4	Navotas Fishing Complex, Navotas, Rizal	Marine Fisheries	-
5	National Livestock Research Center Alabang, Rizal	Poultry, Swine	-
6	Bicol Agricultural Research Center Camarines Sur	-	Abaca, Coconut, Corn, Rice, Root C., Sorghum, Soybeans, Vegetable, I. Fisheries, Water, R. Sociology, Econ.
7	National Fishery Research Center Leganes, Iloilo	I. Fisheries (Brackish-Bangus), I. Fisheries (Brackish-Shrimps) Soybeans, Sugarcane	-
8	La Granja Agricultural Research Center, La Carlota City	Soybeans, Sugarcane	Cotton, Corn, Rice, Sorghum, Vegetables, Beef, Swine, Soil & Water Resources, R. Sociology, Economics,
9	Palawan Agricultural Research Center, Aborlan, Palawan	-	Cacao, Coconut, Coffee, Fruit, Oils, Soybeans, Tea, Beef, Soil Resources.

Annex G - Cont'd

Map Number	Name and Location Agricultural Research Centers	Main Station for	Cooperating Station for
10	Eastern Visayas Agricultural Research Center, Baybay, Leyte	Root Crops	Coconut, Corn, Rice, Sorghum, Sugarcane, Beef, Water, R. Sociology, Economics
11	Central Mindanao Agricultural Research Center I, Malaybalay, Bukidnon	Forage/Pasture, Beef	Cacao, Coffee, Tea, Dairy, Forestry, Wildlife, Soil,
12	Central Mindanao Agricultural Research Center II, Musuan, Bukidnon	-	Corn, Forage/Pasture, Rubber, Sorghum, Soybeans, Beef, Water, R. Sociology, Economics
13	Davao Agricultural Research Center, Davao City	Cacao, Coconut, Coffee, Tea	Abaca, Cotton, Fruit, Soybeans, Spices, Horticulture, Beef, Soil.
14	Southern Mindanao Agricultural Research Center, Kabacan, Cotabato	Corn, Rubber (for small holders system), Sorghum	Cotton, Fruit, Oils, Rice, Root Crops, Soybeans, Vegetables, Native Tobacco, Beef, Poultry, Swine, Soil & Water Resources

Map Number	Name and Location Cooperating Station	Coordinated by Center No.	Commodity(s) to be researched
1	PVTA Nangalisan Experimental Station, Laoag, Ilocos Norte	2	Virginia Tobacco
2	Ilocos Norte Insitute of Technology, Batac, Ilocos Norte	1	Soil Resources, Water Resources
3	Bantay Cotton Experimental Station, Bantay, Ilocos Norte	3	Cotton
4	Baguio Experimental Station Baguio City	3	Sericulture
5	BFD, Experimental Station Baguio City	1	Forest Produc. and Parks & Wildlife Management

Annex G - Cont'd

Map Number	Name and Location Cooperating Station	Coordinated by Center No.	Commodity(s) to be researched
6	Mountain State Agricultural College, La Trinidad, Benguet	1,13	Coffee, Fruit, Corn, Horticulture, Tea, Vegetables, R. Sociology and Macro-economics
7	Cagayan Valley Agricultural College, Lal-lo, Cagayan	10	Root Crops
8	Camalaniugan BF Fishery Station, Camalaniugan, Cagayan	7	Inland Fisheries
9	Cagayan Valley Experimental Station, San Mateo, Isabela	1	Rice
10	PTA Tumauini Experimental Station, Tumauini, Isabela	2	Native Tobacco
11	BFD, Magat Experimental Station, Diadi, Nueva Vizcaya	1	Forest Prod. and Parks & Wildlife Management
12	PVTA Virginia Tobacco Experimental Station Rosario, La Union	2	Virginia Tobacco
13	BF Fishery Station Lucap/Alaminos, Pangasinan	7	Inland Fisheries
14	PVTA Station Urdaneta, Pangasinan	2	Virginia Tobacco
15	PTA Station Cabiao, Nueva Ecija	2	Native Tobacco
16	Luzon Experimental Station Floridablanca, Pampanga	3	Sugarcane
17	BVE Fishery School Malolos, Bulacan	7	Inland Fisheries
18	Philippine Atomic Research Center, Quezon City	1	Rice
19	Bureau of Agricultural Economics, Quezon City	1	Macro-economics

Annex G - Cont'd

Map Number	Name and Location Cooperating Station	Coordinated by Center No.	Commodity(s) to be researched
20	National Food & Agriculture Council Marketing Research Unit, Quezon City	1	Macro-economics
21	PNA Tobacco Research & Development Center, Quezon City	2	Native Tobacco
22	Alabang Central Soil Research Station, Alabang, Rizal	1	Soil Resources
23	Don Severino National Agricultural College, Indang, Cavite	13	Cacao, Coffee, Tea
24	Manuel A. Roxas Memorial Experimental Station, Lipa City	1	Fruit Crops
25	BF Fishery Station Calatagan, Batangas	4	Marine Fisheries
26	PCA Coconut Station Alaminos, Laguna	13	Coconut
27	Tiaong Coconut Experimental Station, Tiaong, Quezon	13	Coconut
28	BF Fishery Station Mercedes, Camarines Norte	4	Marine Fisheries
29	Tigaon Abaca Seedbank Tigaon, Camarines Sur	1	Abaca
30	Albay Parks & Wildlife Research Station, Albay, Albay	1	Forest Prod. and Parks & Wildlife Management
31	Milagros Stock Farm Milagros, Masbate	11	Forage/Pasture Beef/Carabeef
32	Victoria Horticultural Center, Victoria, Oriental Mindoro	1	Fruit Crops

Annex G - Cont'd

Map Number	Name and Location Cooperating Station	Coordinated by Center No.	Commodity(s) to be researched
33	BF Fishery Station Nauja, Oriental Mindoro	7	Inland Fisheries
34	Mindoro Demonstration Farm, San Jose, Occidental Mindoro	2 & 3	Virginia Tobacco Cotton
35	Mindoro Parks & Wildlife Research Station, San Jose, Occidental Mindoro	1	Parks and Wildlife Management
36	Malampaya Fishery Station Malampaya, Palawan	4	Marine Fisheries
37	Palawan Wildlife Management Station, Puerto Princesa	1	Forest Prod. and Parks & Wildlife Management
38	University of Eastern Philippines, Catarman, Samar	1,10,13	Coconut, Root Crops, Spices, R. Sociology, Macro-economics
39	Abuyog Experimental Station Abuyog, Leyte	1	Abaca
40	Mandaue Experimental Station Mandaue, Cebu	1	Fruit Crops
41	University of San Carlos Cebu City	1	R. Sociology Macro-economics
42	Cebu Reforestation & Wildlife Research Station, Cebu City	1	Forest Prod. and Parks & Wildlife Management
43	Guimaras Fruit Station Guimaras Island	1	Fruit Crops
44	Central Philippine University Iloilo City	1	Rice
45	Visayas Rice Experimental Station, Iloilo City	1	Rice, Water Resources
46	Iloilo National College of Agriculture, Lambunao, Iloilo	13	Cacao, Coffee, Tea

Annex G - Cont'd

Map Number	Name and Location Cooperating Station	Coordinated by Center No.	Commodity(s) to be researched
47	Siliman University Dumaguete City	1	Ind. Oils & Spices
48	Xavier University Cagayan de Oro City	13	Rural Sociology Macro-economics
49	MSU Naawan Fishery Station Naawan, Misamis Oriental	7	Inland Fisheries
50	BPI Horticultural Station Claveria, Misamis Oriental	1,2	Vegetable Crops Native Tobacco
51	Twin Rivers Research Center Tagum, Davao del Norte	1	Fruit, Vegetables
52	PCA Research Station San Ramon Penal Colony Zamboanga City	13	Coconut
53	Zamboanga School of Fishery Zamboanga City	7	Marine Fisheries
54	Zamboanga Forest Experimental Station, Zamboanga City	1	Forest Prod. and Parks & Wildlife Management
55	U.P. Land Grant Station (Research Center for Commercial Rubber Prod) Basilan City	13,14,1	Coconut Fruit, Rubber
56	MSU Bongao Fishery Station Tawi-Tawi	4	Marine Fisheries

Annex H

Membership on Commodity Teams Involved in Project and Membership of PCAR Secretariat

Rice and Wheat

Pedro B. Escuro	Team Leader Crop Improvement	PhD, Univ of Minn.
Anacleto Paras	Small Too Devt	M.S., UPLB
Emiliano Bernardo	Insect Control	PhD, Kansas State
Eduvigis Pantastico	Crop Physiology	PhD, UPLB
Aurelio Briones	Water, Soil, & Fertilizers	PhD, U of Hawaii
Ernesto Abarientos	Production Economics	PhD, U of Hawaii
Delfin Lapis	Disease Control	PhD, U of Minn.
Erlinda Pili	Seed Technology	M.S., Miss. U.
Angelita Mundo	Food Professing	M.S., UPLB
Silvestre Andales	Crop Processing	M.S., UP
Antonio Bustrillos	By-Prod. Utilization	PhD
Eugenio Sabalvoro	Cultural Management, Multi-cropping	PhD, Aberden University
Roger Cuyno	Rural Sociology	PhD, UPLB
Agapito Tauro	Weed Control	M.S., UPLB
Lorenzo Lagandaon	Marketing	
Ponciano Batugal	Clonal Adoptation and Improvement	Ph.D.
Leticia Manzon	Pest Control	M.A., Miss. Univ.
Ricardo Gloria	Cultural Management, Cropping Systems	M.S., UPLB
Modesto Yao	Quality Control	PhD
Epifanio Sandique	Prod. Includ. Economics	
Onofre Grino	Plantation Technique	
Ramon Asagra	Production Technique	
Jorge Davide	Soil Chem. & Fertility	PhD, Purdue U.
Nestor Navasero	Small Tools & Dest	B.S., UPLB
Ruben Barraca	Crop Physiology	M.S., UPLB

Corn & Sorghum

Antonio Mercado	Team Leader	PhD, Nebraska U.
Senen Alcos	Extension Education	M.S., UPLB
Ofelio Exconde	Plant Pathology	PhD, Kansas State
Gino Orticio	Feed Grain/Econ./Mktg.	B.S., UPLB
Romeo Quintana	Culture & Management	PhD, Texas A&M

Corn & Sorghum (contd)

Rosendo Palis	Crop Physiology	PhD, Kansas State
Fabian Tiongson	Marketing	PhD, Cornell U.
Hipolito Custodio	Entomology	B.S., UPLB
Luz U. Onate	Utilization	PhD, Iowa State
Roberto Virtucio	Crop Improvement	B.S., UPLB
Modesto Madrid	Weed Control	B.S., CSNAS
Manolo Villano	Engineering/Processing	B.S., UPLB
Enrique Pacardo	Physio. & Nutrition	Ph.D.
Edilberto Reyes	Soil Chem. & Fertility	Ph.D., U of Calif.
Leoncio Raymundo	Storage, Utilization	PhD., Cornell U.
Reynaldo Lantin	Eng'g, Small Tools	PhD, Iowa State
Cesar Villegas	Cultural Improvement	PhD, Iowa State
Rafael Bartolome	Culture & Management	M.S.
Roger Megino	Prod. & Industry	M.S., UPLB
Archimedes Handog	Extension Education	B.S., UPLB
Teofilo Dallente	Marketing	
Romeo Sanchez	Farm Org. & Credit	

Soybean and Other Field Legumes

Florendo Quebral	Team Leader Plant Pathology	Ph.D., Illinois U.
Ricardo Lantican	Crop Improvement	PhD, Iowa State
Carlos Rosario	Eng'g, Small Tools	B.S., UPLB
Igmidio T. Corpus	Soil & Soil Fertility	PhD, Cornell U.
Isaac Cagampang	Culture & Management	PhD, Purdue U.
Romeo Rejesus	Entomology	PhD
Beatriz Mercado	Weed Science	PhD, Iowa State
Virgilio Garcia	Food & Ind. Utilization	M.S., Iowa State
Romeo Huelgas	Prod. & Ind. Econ	B.S., UPLB
Rolando Corcolon	Marketing	B.S., UPLB
Benjamin Legaspi	Extension Education	B.S., UPLB
Rene Mondragon	Seed Technology	B.S.

PCAR Secretariat

Joseph Madamba	Director General	PhD, U of Illinois
Ramon Valmayor	Dep Dir Gen Programs & Operations	PhD, U of Florida

Annex H - Cont'd

PCAR Secretariat (Cont'd)

Francisco Tetangco	Dep Dir Gen Sta. Development	BSA, UPLB
Romeo A. Obordo	Crops Research Director	Ph.D. Texas A&M
Alfonso Eusebio	Livestock Res. Director	Ph.D. U of Maryland
Feliberto Pollisco	Forestry Res. Director	Ph.D. Syracuse U.
Aida Librero	Socio-Econ Res. Dir. Soil & Water Res. Dir	Ph.D. U. of Minn.
Elvira O. Tan	Acting Fisheries Research Director	Ph.D. Kiel U.
Thomas Flores	Technical Service Dir.	Ph.D. U of Wisc.
Genaro Revilleza	Admin Officer	
Manuel Frias	Chief Accountant	
Ambrosio Catalla	Auditor	

Annex I

PCAR AGREEMENTS WITH OTHER INSTITUTIONS

Institution	Objectives	Date Signed
1. Department of Agriculture and Natural Resources (BPI, BAI, BF, BFD, BS)	Mutual/joint efforts for development of the research capabilities of certain experiment stationsof these bureaus.	7 June 1973
2. Association of Colleges of Agriculture in the Philippines (ACAP)	Mutual/joint efforts for development of selected experiment stations of the member colleges which are tapped to be part of the PCAR Network.	7 September 1973
3. University of the Philippines at Los Banos	Setting up a "PCAR Graduate Fellowship-Study Grant" to provide training grants to staff members of government institutions engaged in research in agriculture, forestry and fisheries, (Initial fund deposit P200,000). This is part of PCAR program to strengthen research institutions through staff development.	15 November [illegible]
4. Twin Rivers Research Center (Private Sector)	Establishing a regular research working arrangement aimed at the promotion of the production of dollar-saving and dollar-earning crops.	29 November [illegible]
5. International Rice Research Institute (IRRI)	Making IRRI library holdings available to PCAR's Scientific Literature Service (SLS).	8 January [illegible]
6. National Computer Center (Department of National Defense) (NCC)	Establishing with the assistance of NCC, a computer-based PCAR Information System.	24 April 1974
7. University of the Philippines at Los Banos.	Making UPLB library holdings available to PCAR's Scientific Literature Service (SLS).	22 May 1974
8. University of the Philippines	Setting up a PCAR Fellowship-study grant in the U.P. College of Fisheries.	20 June 1974

Annex I - Cont'd

Institution	Objectives	Date Signed
9. Weather Bureau	Establishing an agrometeorological station at the La Granja Agricultural Research Center, the first center being established under the PCAR Network of research stations. Agromat instruments and facilities and observer to be provided by Weather Bureau; PCAR to provide site, building, light, water and accommodation to observer. (Similar agreement being worked out for three centers)	9 July 1974
10. International Rice Research Institute (IRRI)	Scientific and technical cooperation in research on rice and multiple cropping technology. (Primarily 1) exchange of scientific literature, information and methodology, and 2) use by IRRI of PCAR station network).	15 August 1974
11. University of the Philippine System	Setting up a PCAR Agribusiness Fellowship-Study Grant in the U.P. College of Busines Administration.	10 October 1974
Under Negotiation with		
1. Asia Vegetable Research and Development Center (AVDRC) Taiwan	Cooperative research work on vegetable crops. One of the stations of the PCAR research network will serve as an outreach station of AVDRC.	(To be signed soon)
2. International Maize and Wheat Improvement Center (CIMMYT), Mexico	Cooperative research work on corn and wheat.	
3. Centro International de Agriculture Tropical (CIAT), Columbia	Cooperative research work on root crops, legumes, livestock, and cropping systems.	

Annex J

Tentative List of Research Equipment and Materials

ITEM	NUMBER OF UNITS FOR: CLARC	BARC	LOARC	SMARC	TOTAL	EST. UNIT COST $	TOTAL COST $
1. Field Research Equipment and Machinery							
Battery creping	-	-	-	1	1	9,600	9,600
Battery, sheeting	-	-	-	1	1	4,800	4,800
Boiler	1	1	-	-	2	600	1,200
Bulk density soil sampler	-	-	2	-	2	600	1,200
Bus, mini	2	2	2	1	7	7,800	54,600
Breeder kit (plant)	-1	-	-	-	1	1,000	1,000
Camera	1	1	1	1	4	350	1,400
Car, staff	1	1	1	1	4	6,500	26,000
Coagulating, units with tank	-	-	-	1	1	9,600	9,600
Collecting tank with trailer	-	-	-	1	1	1,800	1,800
Crumbling unit	-	-	-	1	1	25,200	25,200
Curometer	-	-	-	1	1	1,800	1,800
Emulsifier	-	-	-	1	1	1,920	1,920
Engine, blackstone	-	-	-	1	1	6,000	6,000
Fertilizer, distributor	1	1	1	1	4	1,500	6,000
Fumigun soil	2	-	2	2	6	240	1,440
Generator, electric	1	-	-	1	2	7,370	14,740
Grain aerator	-	-	-	1	1	2,400	2,400
Germinator	1	-	-	1	1	300	300
Grain, aerator, Hi-power	1	-	-	-	1	85	85
Grain, Dryer, set	1	1	-	1	3	4,800	14,400
Gravitometer	-	-	-	1	1	1,200	1,200
Harrow	-	-	1	1	2	2,200	4,400
Huller	1	-	-	1	2	60	120
Jeep (Ford Fiera)	2	2	2	2	8	3,000	24,000
Machine, centrifuge latex	-	-	-	1	1	4,200	4,200
Machine, flexing	-	-	-	1	1	1,080	1,080
Machine, pelleting	-	-	1	-	1	60	60
Machine seed treating	1	-	-	-	1	1,000	1,000
McGill Miller #3	1	-	-	-	1	1,100	1,100
McGill, sheller	1	-	-	-	1	770	770
Parshall flumes 3"	-	-	3	-	3	180	540
Parshall flumes 6"	-	-	3	-	3	360	1,080
Pick-up (Ford Fiera)	3	2	2	1	8	5,800	46,400
Plastometer	-	-	-	1	1	1,200	1,200
Press hydraulic (5-ton capacity)	-	-	-	1	1	1,200	1,200
Plow	-	-	4	-	4	1,450	5,800
Pump, centrifuge, PORTABLE	1	2	-	1	4	1,740	6,960

Annex J - Cont'd

ITEM	NUMBER OF UNITS FOR: CLARC	BARC	LGARC	SMARC	TOTAL	EST. UNIT COST $	TOTAL COST $
Pump, irrigation with accessories	-	-	1	2	3	43,200	129,600
Recorder, moisture	1	-	-	-	1	650	650
Retort	-	1	-	-	1	130	130
Rotatiller	1	-	-	-	1	740	740
Rotovator	1	2	4	2	9	1,100	9,900
Seeder	-	-	-	1	1	60	60
Seed cleaner	1	1	1	1	4	1,200	4,800
Seed cleaner/blower	1	1	1	1	4	1,200	4,800
Seed blower	-	-	1	1	2	654	1,308
Sheller, corn	-	-	-	1	1	1,596	1,596
Sheller, soybean	1	1	2	1	5	1,130	5,650
Sieves, rice #608	4	-	-	-	4	40	160
Sieves, shaker Ro-Tap Testing	1	-	-	-	1	700	700
Sieves, sorghum #609	4	-	-	-	4	8	32
Sprayer, knapsack with accessories	15	4	10	12	41	34	3,444
Sprayer, power	3	1	2	2	3	3,180	25,440
Sprayer/Soil injector	1	-	-	1	2	263	526
Soil auger	-	-	2	-	2	45	90
Soil auger, bucket type	4	-	-	-	4	20	80
Soil test kit	1	-	-	-	1	200	200
Steel tank (50 x 60 x 60 cm)	-	-	6	-	6	55	330
Stilling well	-	-	1	-	1	90	90
Sub-soiler	-	-	1	1	2	880	1,760
Test, compression set	-	-	-	1	1	900	900
Test, mixing rolls	-	-	-	1	1		
Tester, abrasion	-	-	-	1	1	1,800	1,800
Tester, compression defletion	-	-	-	1	1	1,800	1,800
Tester, hardness	-	-	-	1	1	1,200	1,200
Tester, moisture burros universal	1	-	-	-	1	600	600
Thresher, rice	3	1	1	2	7	1,032	7,224
Thresher, sorghum	1	1	-	1	3	858	2,574
Thresher, soybean/peanut	1	-	2	1	4	858	3,432
Tractor, 4-wheel with complete attachment	2	2	2	2	8	19,200	153,000
Tractor, Hand attachments	4	2	4	6	16	960	15,360
Trailer	3	-	2	1	6	2,230	13,380
Truck (cargo)	1	1	1	1	4	14,000	56,000
Viscometer, flow	-	-	-	1	1	1,200	1,200
Washer, scrap	-	-	-	1	1	2,400	2,400
Weighing scale, platform type (2-ton capacity	-	-	-	1	1	600	600
Sub-Total							$740,000

ITEM	NUMBER OF UNITS FOR CLARC	BARC	LGARC	SMARC	TOTAL	EST. UNIT COST $	TOTAL COST $
2. Laboratory Equipment							
Air conditioner	2	1	2	2	7	1,350	9,450
Analyzer, Auto	-	-	1	-	1	600	600
Analyzer, infrared	-	-	1	-	1	2,200	2,200
Applicator, micro-pesticide (automatic)	-	-	1	-	1	240	240
Applicator, pesticide	1	1	-	-	2	350	700
Autoclave	3	1	2	2	8	738	5,904
Balance, Analytical	1	-	2	1	4	2,150	8,600
Balance, Autogram	-	1	-	-	1	370	370
Balance, Beam	-	1	2	-	3	84	252
Balance, Mattler	-	1	1	1	3	3,400	10,200
Balance, moisture, det.	1	1	2	-	4	570	2,280
Balance, rough	1	1	2	-	4	360	1,440
Balance, Toledo beam	-	2	-	-	2	80	160
Balance, Torsion	2	1	2	1	6	275	1,650
Balance, Triple beam	-	-	5	1	6	84	504
Breeding kit (plant)	1	1	-	-	2	180	360
Bunsen burner	11	-	12	-	23	10	230
Bulk density soil samples	-	-	-	1	1	600	600
Calculator, electronic	4	2	2	2	10	900	9,000
Calculator, manual	2	4	4	3	13	800	10,400
Calculator with programmable	1	-	1	-	2	1,700	3,400
Camera, Accessories	2	-	-	1	3	400	1,200
Camera, Movie	1	-	-	-	1	10,800	10,800
Camera, Vertical	1	-	-	-	1	3,000	3,000
Centrifuge, ordinary	-	-	1	-	1	1,630	1,630
Centrifuge, refrigerated	-	-	1	-	1	4,100	4,100
Chem. carts, stainless	-	-	2	-	2	90	180
Chromatograph, gas	1	-	1	-	2	12,800	25,600
Clothing, protective	2	-	-	2	4	40	160
Conductivity bridge	-	-	1	-	1	620	620
Cork borer	-	-	4	2	6	125	750
Counter	-	-	3	1	4	250	1,000
Counter, geiger	1	-	-	-	1	600	600
Cutter, paper	-	1	-	-	1	3,440	3,440
Cutter, Stencil (elec.)	-	1	-	-	1	3,000	3,000
Dehumidifiee	1	-	-	-	1	5,500	5,500
Demineralizer cartridge	1	-	-	-	1	250	250
Dessicator	-	-	3	2	5	150	750
Digestion apparatus Kjeldahl	-	-	2	-	2	350	700
Digestion apparatus Micro-Kjeldahl	1	-	-	-	1	220	220
Distilling apparatus Kjeldahl	-	1	2	1	4	610	2,440
Distilling apparatus	-	-	3	2	5	550	2,750
Distiller, water	-	1	1	1	3	11,500	34,500
Double boiler	1	-	2	-	3	18	54

Annex J - Cont'd

ITEM	NUMBER OF UNITS FOR CLARC	BARC	LGARC	SMARC	TOTAL	EST. UNIT COST $	TOTAL COST $
Engraver apparatus (Elec. equipment)	-	-	1	-	1	18	18
Evaporator, rotary	1	-	-	-	1	600	600
Evaporator, vacuum	-	1	-	-	1	600	600
Extractor, oil	1	-	-	-	1	1,000	1,000
Flame phocometer	-	1	1	1	3	3,500	10,500
Fermentor	-	1	-	-	1	210	210
Fume hood	2	1	3	2	8	1,200	9,600
Germinator	1	-	-	-	1	280	280
Glassware (includes test tubes, flask, beakers, pipettes, etc.)			(Supplies)			1,000	1,000
Gloves, protective	-	-	-	2	2	30	60
Grinder, sample	-	-	-	1	3	1,100	3,300
Growth chamber	-	-	1	-	1	4,650	4,650
Hot plate	1	1	8	4	14	240	3,360
Humidifier	-	-	-	1	1	5,480	5,480
Hydrometer	1	-	4	4	9	12	108
Hygrothermograph	-	-	1	-	1	430	430
Incubator	1	-	-	2	3	2,300	6,900
Inoculation chamber	1	-	1	2	4	300	1,300
Jogger, paper	-	1	-	-	1	1,020	1,020
Laboratory chem. cart	-	1	-	-	1	170	170
Laboratory tool kit	-	1	1	-	2	115	230
Lightometer	2	-	-	-	2	45	90
Machine, copying electrostatic	1	-	-	1	2	2,400	4,800
Machine, mimeographing	1	-	-	1	2	1,800	3,600
Machine, seed treat	1	-	-	1	2	1,000	2,000
Meter, grain moisture	-	-	-	1	1	300	300
Meter, moisture	2	-	-	4	6	900	5,400
Meter, pH	3	1	2	1	7	820	5,740
Microlamp	-	-	-	1	1	240	240
Microscope, compound	1	1	2	1	5	1,400	7,000
Microscope, dissect.	1	-	2	1	4	1,300	5,200
Microscope, stereo	1	-	2	1	4	850	3,400
Microtone	-	-	-	1	1	2,000	2,000
Microtome, rotary	1	-	1	-	2	1,400	2,800
Mount, ricker	48	-	-	24	72	2.50	180
Mount, ricker	-	-	24	-	24	3	72
Oven, electric	-	-	-	1	1	1,050	1,050
Oven, forced circulation	2	1	2	2	7	1,380	9,660
Oven, ordinary	2	1	2	2	7	1,050	7,350
Pershall flumes 3"	-	-	-	3	3	180	540
Pershall flumes 6"	-	-	-	3	3	360	1,080
Pershall flumes 9"	-	-	-	3	3	500	1,500
Photo-micrographic set	-	-	1	-	1	1,630	1,630
Photo-micrographic equipment	1	-	-	-	1	1,500	1,500

Annex J - Cont'd

ITEM	NUMBER OF UNITS FOR CLARC	BARC	LGARC	SMARC	TOTAL	EST. UNIT COST $	TOTAL COST $
Phyrbeliograph	1	-	-	1	2	420	840
Pressure plate apparatus vacuum pump	1	1	-	1	3	1,200	3,600
Probe, soil neutron (with rate meter)	-	-	-	1	1	600	600
Probe, soil neutron (with rate meter)	-	1	-	-	1	240	240
Projector, Movie	-	1	-	-	1	10,800	10,800
Project, Slide	2	2	-	1	5	620	3,100
Public address system	-	-	-	1	1	720	720
Pump, vacuum	-	-	1	2	3	1,700	5,100
Radio, Communication Network Equipment	-	1	-	-	1	30,000	30,000
Range, gas	1	-	1	1	3	950	2,950
Recorder, micro-volmeter	-	1	-	-	1	60	60
Recorder, tape	-	-	-	1	1	350	350
Refractometer	2	-	1	-	3	3,540	10,620
Refrigerator	2	2	2	2	8	1,000	8,000
Respirator	5	-	-	1	6	7	42
Sacrifier	1	-	-	-	1	120	120
Seitz filter	2	-	2	2	6	115	690
Sieve, brass	-	-	-	1	1	72	72
Sieve, set	2	-	-	2	4	48	192
Shaker	1	1	2	1	5	700	3,500
Soil auger	-	-	-	2	2	45	90
Soil cell thermistor	-	-	30	-	30	450	13,500
Soil moisture temp. meter	-	-	1	-	1	30	30
Soil sampler	-	-	-	2	2	33	66
Soil sampling, equip. set	-	-	2	-	2	260	520
Spectrophotometer	-	-	1	-	1	2,650	2,650
Spatula, stainless	5	-	6	-	11	5	55
Steam bath	2	-	-	-	2	300	600
Steel tanks (50 x 60 x 60 cm)	-	-	-	6	6	55	330
Stethoscope, Ford	2	-	-	1	3	10	30
Stereoscope, Pocket	1	1	-	1	3	40	120
Stereoscope, Mirror	1	1	-	1	3	320	960
Stirrer	1	-	2	-	3	420	1,260
Stirrer, magnetic	-	-	-	1	1	415	415
Stove	-	-	-	1	1	240	240
Stove	1	-	-	-	1	600	600
Terderometer	1	1	-	-	2	240	480
Test kit, chloride	-	-	-	1	1	20	20
Test kit, sulfate	-	-	-	1	1	20	20
Tester, moisture	1	-	2	2	5	900	4,000
Thermometer	-	-	-	1	1	15	15
Thermometer, clinical	2	-	-	-	2	12	24
Thermometer, max-min	2	-	-	1	3	55	165
Thermometer, max-min	-	2	-	-	2	120	240

Annex J - Cont'd

ITEM	NUMBER OF UNITS FOR PCAR	CLARC	BARC	LGARC	SMARC	TOTAL	EST. UNIT COST $	TOTAL COST $
Thermograph, soil-air water (at three levels)	-	-	-	1	1	2	1,300	2,600
Tissue culture set	-	-	-	1	-	1	12,000	12,000
Tissue grinder, willey	-	-	-	2	-	2	220	440
Transformer, variable	-	-	-	-	1	1	150	150
Trapping, equipment	-	2	1	1	-	4	110	440
Typewriter, electric	-	1	-	-	-	1	1,000	1,000
Typewriter, manual	-	2	3	3	2	10	600	6,000
Ultra-violet hand light	-	2	-	-	-	2	100	200
Sub-Total								$ 420,500

3. Library, Production, Communication and Related Materials

Card Catalog	1	-	-	-	-	1	700	700
Collator	1	-	-	-	-	1	2,350	2,350
Varity per, complete	1	-	-	-	-	1	7,950	7,950
Embossing Machine	1	-	-	-	-	1	1,020	1,020
Headliner (Varity per)	1	-	-	-	-	1	5,220	5,220
Micro-film reader Printer and Cabinet	1	-	-	-	-	1	12,000	12,000
Mimeograph Machine	-	2	2	1	1	6	1,600	9,600
Postage Machine	1	-	-	-	-	1	240	240
Books, Journals, Science Publication	14020	25000	25000	27500	27500	-	-	119,020
Computer (software)	4000	-	-	-	-	-	-	4,000
Library, shelves Furniture, Ventilations	-	10000	12400	12400	12400	-	-	47,200
Library Supplies binding	-	7400	7400	7500	7500	-	-	29,800
Copying service	-	4400	2000	1000	1000	-	-	8,400
Exposure Cabinet	2500					-	-	2,500
Sub-Total								$ 250,000
Grand Total of Three Areas								$1,410,500

CLARC - Central Luzon Agricultural Research Center
BARC - Bicol Agricultural Research Center
LGARC - La Granja Agricultural Research Center
SMARC - Southern Mindanao Agricultural Research Center

Annex K

TELEGRAM

AMEMB MANILA CONTROL

UNCLASSIFIED
Classification

FEB. 23, 1975
2:25 AM

R 221801Z FEB 75
ACTION FM SECSTATE WASHDC
AID-8 TO AMEMBASSY MANILA 3420
BT
INFO UNCLAS STATE 040645
AMB
MIN AIDAC
ADM
ECON E.O. 11652: N/A
CRU TAGS:

13/sh SUBJECT: TDY ENVIRONMENTAL SPECIALIST
REF: (A) MANILA 1874 (B) STATE 016088

1. AID/W REVIEW OF ENVIRONMENTAL REQUIREMENTS FOR AG RESEARCH AND SMALL SCALE PROJECTS DOES NOT SEEM TO WARRANT TDY ENVIRONMENTAL SPECIALIST AT THIS TIME. WE BELIEVE ENVIRONMENTAL ANALYSES AND/OR APPROACH TO THESE PROJECTS INCLUDING SECTIONS FOR INCLUSION IN PROJECT PAPERS CAN BE PREPARED AT MISSION WITH FOLLOWING GUIDANCE:

2. FOR SMALL SCALE IRRIGATION: SINCE ENVIRONMENTAL ASSESSMENT OF IRRIGATION PROJECTS IS VERY SITE-SPECIFIC, AND ALL SITES ARE NOT YET FIRMLY CHOSEN, SUGGEST ENVIRONMENTAL ANALYSIS BE UNDERTAKEN IN MANNER SIMILAR TO THAT FOR SEDERHANA IRRIGATION PROJECT CURRENTLY UNDER CONSIDERATION FOR INDONESIA. UNDER SEDERHANA PLAN, ENVIRONMENTAL IMPACT IS IDENTIFIED BY MEANS OF CHECKLIST COMPLETED AT TIME OF INDIVIDUAL SUB-PROJECT INVESTIGATION AND DESIGN, WITH SUBSEQUENT REVIEW AT PROVINCIAL LEVEL BY KNOWLEDGEABLE ENGINEERS. IF SUCH CHECKLIST REVIEW INDICATES NEED FOR FURTHER INVESTIGATION AND POSSIBLE

REDESIGN OR INITIATION OF CONTROLS TO MINIMIZE ADVERSE ENVIRONMENTAL IMPACT, ADDITIONAL STUDIES CAN BE UNDERTAKEN AT THAT TIME. TOM JOHNSON MAILED COPY OF SEDERHANA PROJECT PAPER TO USAID FOR GUIDANCE AS TO THIS APPROACH. PROJECT PAPER UNFORTUNATELY DID NOT INCLUDE ORIGINAL SEDERHANA REPORT AND SAMPLE CHECKLIST EXCEPT BY REFERENCE; THEREFORE, COPY OF THIS REPORT AND SAMPLE CHECKLIST POUCHED TODAY TO D. DANGLER. BECAUSE REVIEW OF CHECKLISTS AT PROVINCIAL LEVEL MUST BE UNDERTAKEN BY ENGINEERS KNOWLEDGEABLE IN ENVIRONMENTAL CONSEQUENCES

UNCLASSIFIED
Classification

FORM FS-412(H)
11-72

OF INTEGRATED PROJECTS, USAID MAY WISH TO CONSIDER HOLDING AN INTRODUCTORY SEMINAR FOR BISA ENGINEERS THAT WILL BE INVOLVED IN INVESTIGATIONS PRIOR TO COMPLETING CHECKLISTS AND IN REVIEWING CHECKLISTS FOR ADEQUACY AND IDENTIFICATION OF POTENTIAL ADVERSE EFFECTS AS INTEGRAL PART OF PROJECT.

3. FOR AG RESEARCH: WE BELIEVE ASSESSMENT OF ENVIRONMENTAL IMPACT OF CONSTRUCTION OF LABORATORIES AND OTHER BUILDINGS ON EXISTING RESEARCH SITES, AS WELL AS IMPACT OF USE OF FARM MACHINERY AT RESEARCH SITES, CAN BE PERFORMED BY MISSION PERSONNEL UNDER DIRECTION OF D. DANDLER AND WITH GUIDANCE FROM AID'S ENVIRONMENTAL ASSESSMENT GUIDELINES MANUAL OF SEPTEMBER 1974. SUCH IMPACTS RESULTING FROM ADDITIONAL LAND CLEARINGS, SOIL EROSION, CHEMICAL USE, POTENTIAL STREAM POLLUTION BY NEW OR EXPANDED FACILITIES, ETC., SHOULD BE ADDRESSED. WITH RESPECT TO (SEE B) PARA 2.(H) FIRST SENTENCE, THIS NOT INTENT TO IMPLY IMPACT OF END-PRODUCTS OR RESULTS OF RESEARCH WILL BE ASSESSED SINCE SUCH END-PRODUCTS NOT READILY IDENTIFIED AT THIS TIME. HOWEVER, IT COULD BE DESIRABLE TO INCLUDE STATEMENT THAT PCAR WILL BE ENCOURAGED TO ASSESS NATIONAL IF NOT WORLD-WIDE IMPACT OF NEWLY DEVELOPED FOOD GRAIN STRAINS OR OTHER AGRICULTURAL PRODUCTS OR PROCESSES DERIVED FROM RESEARCH PRIOR TO RELEASING SUCH NEW PRODUCTS FOR WIDE DISSEMINATION AND USE. SUCH A STATEMENT COULD BE REINFORCED TO INDICATE ON THAT MISSION AND PCAR HAVE INDEED HELD DISCUSSIONS TOWARD THAT END. ALSO, EVIDENCE THAT TRAINING INPUT AS DESCRIBED AG RESEARCH PRP PAGES 10-11 REGARDING ENVIRONMENTAL AWARENESS IN CURRICULUM FOR TRAINEES WOULD STRENGTHEN SUCH A STATEMENT.

MORE APPROACH FULLY DISCUSSED WITH JOHNSON.

ANNEX L

April 21, 1975, Monday PHILIPPINES DAILY EXPRESS

BETTER AGRI PLANS OUTLINED AT UP MEET

MORE EFFECTIVE agricultural services and improved Masagana rice and corn programs can be expected if the recommendations made in the three-day agricultural policy conference held at the University of the Philippines in Los Banos which ended recently are implemented.

The conference participants made a 17-point recommendation for the improvement of the rice and corn Masagana programs and five-point recommendation for a more effective agricultural extension service.

Recommendations on the Masagana program dealt heavily on the streamlining of policies regarding the provision of inputs, credit, extension, and price support; formulation, monitoring and evaluation of programs; and a delivery mechanism for program outputs.

The participants who discussed policy issues and problems of the Masagana programs observed seven continuing problems which they noted are increasing in importance.

Based on those problems, the group recommended the:

1. Removal of the two-price system for fertilizers, this possibly reducing the price to the level of the food crop sector but capturing the subsidy from export sector through appropriate taxation.

2. Rapid development of an input package for corn through more indepth research, field testing and demonstration.

3. Establishment of seed banks in strategic locations.

4. Continuation of commodity production system campaign as a national agricultural development strategy.

5. Adoption of a government policy on bad debts allowing for the restructuring of loans in view of natural calamities so as not to jeopardize the rediscounting privilege of any rural bank.

6. Examination of the feasibility of establishing comprehensive farm financing.

7. Study possible steps towards encouraging capital formation among farmer participants to make them ultimately self-reliant in their financing needs.

8. Expansion of training to include extension methods as well as the training of middle management personnel like provincial agriculturists.

9. Integrate and unify training of extension personnel possibly to be undertaken by the UPLB and regional centers under its auspices.

10. Phase out the use of extension agents as bill collectors so they can concentrate more on their role as technical advisers to farmers.

11. Restudy of the present price support to assure farmers of continued incentives in rice production and to restructure rice prices to reflect milling grades.

12. Formulation of Masagana targets and priorities based not only on production constraints but also on possible limitations in the delivery of program outputs. The planned period of such programs should be lengthened to at least two years.

13. Expansion of program objectives to include the development of positive farmer attitudes towards savings, loan repayment consciousness and appreciation of data gathering.

14. Improvement of management information and statistical services.

15. Expansion of credit to meet financial requirements for proper threshing, drying and storage facilities.

16. Organization of farmers and farm into economic-size units for purposes of mechanized threshing, drying and storage operations.

17. Training of extension agents on post-harvest operations.

On the other hand, the group which tackled the policy issues and problems of agricultural extension services, recognized the need for a philosophy which would formulate the objectives of agricultural extension and describe the functions and task of agricultural extension workers.

The group also recommended that:

. Means be evolved to minimize, if not remove the duplication of functions and responsibilities of agricultural extension services. Details have to be worked out by representatives of the Bureau of Agricultural Extension, Department of Agrarian Reform, Department of Local Government and Community Development, Bureau of Plant Industry and the National Irrigation Administration.

Better Aggie Plans Outlined at UP Meet
Philippines Daily Express, April 21, 1975

. A common institute, possibly the UPLB, be identified to reorient agricultural extension workers on the goals and objectives of public service and infuse in them the philosophy of agricultural extension.

. The present inter-agency council for coordination, planning and policy formulation be retained, leaving the field implementation aspect to member agencies of the council, and

. A study be made to determine a more equitable incentive and reward system for agricultural extension workers.

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DEPARTMENT OF STATE

TELEGRAM

AMEMB MANILA

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Classification

APR 11, 1975

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FM SECSTATE WASHDC
TO RUMVC/AMEMBASSY MANILA IMMEDIATE 4662/4463
INFO RUKOBT/AMEMBASSY JAKARTA PRIORITY 7645
BT
UNCLAS STATE 082218/1/2

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E.O. 11652:N/A

TAGS:

SUBJECT:AGRICULTURE RESEARCH LOAN PP
REF: STATE 016088
JAKARTA FOR RLA CLARK
1. FA BUREAU PRELIMINARY REVIEW OF SUBJECT PP WAS HELD 28 MARCH TO DISCUSS OUTSTANDING ISSUES AND FUNDING POSSIBILITY. DEPUTY DIRECTOR HUMMON PRESENTED PP.

2. THOUGH BUREAU ENDORSES PROJECT, THERE IS NO APPARENT POSSIBILITY OF FY 75 FUNDING FOR PROJECT. NEVERTHELESS, THE PAPER SHOULD BE REVISED AND PROCESSING CONTINUE APACE AS WE ARE PREPARED PROCEED WITH PROJECT AS HIGH PRIORITY SHELF-ITEM FOR FY 75 AS PLANNED, AND INCLUDE FY 76 CONGRESSIONAL PRESENTATION AS HIGH PRIORITY SHELF ITEM AS WELL.

3. REVIEW CONCLUDED THAT RESEARCH PROJECTS SUCH AS THIS ARE ATTRACTIVE. HOWEVER, THIS PP NEEDS REVISIONS AND ADDITIONS TO STRENGTHEN THE RELATIONSHIP OF THIS PROJECT TO THE NEEDS OF THE POOR MAJORITY BEFORE SUBMISSION TO EAPAC AND DLSC.

4. PARTICULARLY IMPORTANT TO PAPER'S REVISION IS THE NEED TO MORE ADEQUATELY DETAIL THE SYSTEM BY WHICH: (A) THE PROBLEMS OF SMALL FARMER AGRICULTURE ARE IDENTIFIED; (B) SUCH PROBLEMS ARE RECOGNIZED AND CONSIDERED IN THE PROCESS OF APPROVING RESEARCH PROPOSALS UNDER ESTABLISHED CRITERIA; (C) RESULTS OF RESEARCH WILL BE DISSEMINATED TO AND ADOPTED BY THOSE WHO ARE THE INTENDED BENEFICIARIES.

See p. 39 ff.

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5. WE WOULD SUGGEST YOU DISCUSS WITH PCAR THIS PROBLEM IN ITS BROADEST CONTEXT SO AGREEMENT CAN BE REACHED TO BUILD INTO THE EARLY RESEARCH WORK OF PCAR A PROGRAM TO ANALYZE THE NEEDS OF THE POOR FARMERS AND DEVELOP THEREFROM POTENTIAL AREAS OF RESEARCH THAT WILL FOCUS ON THE NEEDS OF THIS TARGET GROUP.

(A) IN THIS SAME CONTEXT WE SUGGEST THAT PP INCLUDE DISCUSSION OF LONG TERM FEEDBACK SYSTEM SO THAT WE CAN BE ASSURED THAT FARMERS NEEDS AND DESIRES ARE REGULARLY COMMUNICATED TO THE RESEARCH ORGANIZATION. See p. 39

(B) WE ALSO SUGGEST PCAR CONSIDER ADDING TO THEIR CRITERIA FOR RESEARCH APPROVAL THE ADDITIONAL CONSIDERATION OF WHO THE INTENDED BENEFICIARIES OF PROPOSED RESEARCH PROJECTS WOULD BE AND HOW IN FACT THEY DEMONSTRATE BENEFIT. p. 40, 64

(C) GIVEN THE UNIQUE POSITION OF PCAR VIS-A-VIS THE OTHER RESEARCH AGENCIES IN THE PHILIPPINES, WE FEEL A VARIOUS OPPORTUNITY EXISTS THROUGH PCAR AND OUR PROPOSED TECH ASSISTANCE TO BEGIN THE LONG AND COMPLEX JOB OF WORK INSTITUTIONALIZING UNQUOTE INTO THE RESEARCH COMMUNITY AN INCREASED FOCUS ON THE PROBLEMS OF THE RURAL POOR. p. 44 Annex L

6. IN THIS CONTEXT, WE SUGGEST DETAILED REVISIONS AS FOLLOWS:

(A) LOG FRAME NEEDS FURTHER IMPROVEMENT TO SHOW LINKAGE BETWEEN PURPOSE AND GOAL. INTERMEDIARY STEPS BETWEEN IMPROVED RESEARCH CAPABILITY (PURPOSE) AND INCREASED FARMER INCOME (GOAL) MUST BE CLEARLY SHOWN. Annex C

(B) COMPREHENSIVE NARRATIVE FOR LOG FRAME NEEDS TO BE PROVIDED IN PP BODY. THIS SHOULD INCLUDE FULLY SUPPORTED DISCUSSION OF HOW RESEARCH PRIORITIES ARE ORDERED, HOW RESULTS WILL BE TRANSFERRED TO FARMERS, HOW FARM PILOT TRIALS WILL BE CARRIED OUT AND HOW BENEFITS WILL ACCRUE TO SMALL FARMERS. p. 5, 39-41

(C) IMPLICIT ASSUMPTIONS THAT ADEQUATE AGRICULTURAL INPUTS AND CREDIT ARE AVAILABLE, PRICING AND MARKETING POLICIES AND SYSTEMS ARE ADEQUATE ETC., MUST BE SUPPORTED. THESE ARE ESSENTIAL TO DEMONSTRATE THAT AGRICULTURE RESEARCH DOES IN FACT BENEFIT SMALL

p. 44

FARMER SATISFYING CONGRESSIONAL MANDATE.

(D) AN EVALUATION PLAN TIED TO THE PURPOSE AND GOAL OF THE PROJECT TO BE DEVELOPED. THE PLAN IN THE PP IS POOR S PLAN AND DOES NOT PROVIDE A SYSTEM TO DETERMINE IF THE RESEARCH RESULTS ARE REACHING AND BENEFITING POOR FARMERS. p. 64

(E) PROJECT SHOULD HAVE BUILT-IN PROVISION FOR ENVIRONMENTAL REVIEW. URGE REPRESENTATIVE FROM NATIONAL ENVIRONMENTAL COMMISSION BE INCLUDED IN TECH PROGRAM PLANNING AND REVIEW BOARD (PG. 15 OF PP) TO INSURE ENVIRONMENTAL IMPLICATIONS OF RESEARCH ARE CONSIDERED. ANNEX AS NOW PREPARED DOES NOT FOLLOW FORM AND INSTRUCTIONS CONTAINED IN M.C. 1214.1, SEPT. 1971. SHOULD BE FURTHER REVISED. Annex F.

(F) SINCE DOLS. 2.24 MILLION PROPOSED FOR FACILITIES DEVELOPMENT, MISSION SHOULD CONFIRM ADEQUACY OF PRESENT COST ESTIMATES AND DETAIL ARRANGEMENTS FOR USAID REVIEW OF CONSTRUCTION CONTRACTS. ASSUME NO FX COST IN FAR ASPECT OF PROJECT. ADVISE IF ASSUMPTION INCORRECT. SINCE U.S. CONTRIBUTION TO EACH SUBPROJECT EXCEEDS DOLS 100,000 CPG'S WILL APPLY TO PROJECT. ALSO DETAIL ARRANGEMENTS FOR MONITORING OF FACILITIES CONSTRUCTION PRIOR TO ACCEPTANCE FOR REIMBURSEMENT. IDENTIFY AND JUSTIFY ANY ANTICIPATED WAIVERS. Table 13, p. 57, p. 62

(G) COVENANTS AND CONDITIONS PRECEDENT SHOULD BE DEVELOPED WHICH PROVIDE ASSURANCES THAT THE PROJECT RESPONDS TO CONGRESSIONAL MANDATES AND THAT THE HOST COUNTRY WILL ADEQUATELY SUPPORT THE PROJECT. THESE SPECIAL CP'S AND COVENANTS MUST BE IDENTIFIED IN BODY OF PP. p. 62a.

(H) STATUTORY CHECKLIST NEEDS REVISION TO CONFORM WITH PROJECT. Annex A

(I) AID/W EXPECTS LOAN AGREEMENTS DRAFTED IN FIELD WITH ASSISTANCE RLA CLARK.

7. TO ASSURE THAT PROJECT IMPLEMENTATION WILL BE WITHIN CURRENT AGENCY GUIDELINES, WOULD BE USEFUL TO INCLUDE AS PP ANNEX A PERT CHART OR DETAILED FLOW CHART SHOWING

INTEGRATION OF ALL PROJECT COMPONENTS WITH SOME FORMAL CALCULATIONS OF TIME ELEMENTS INVOLVED IN EACH. KEY [illegible] p. 63