4980212 (3)

AID 1020-25 (10-70)

REPORT U-446

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PROJECT APPRAISAL REPORT (PAR)

PD-AAD-944-D1

1. PROJECT NO.	2. PAR FOR PERIOD:	3. [redacted]	4. PAR SERIAL NO.
498-11-130-212	1971 TO 12/31/75	Asia Regional	76-3

5. PROJECT TITLE

Asian Vegetable Research and Development Center(AVRDC), Shanhua, Taiwan

6. PROJECT DURATION: Began FY 71 Ends FY *	7. DATE LATEST PROP	8. DATE LATEST PIP	9. DATE PRIOR PAR
	Nov. 7, 1969	-	- 27p.

10. U.S. FUNDING	a. Cumulative Obligation (RED) Thru Prior FY: $ 3 million	b. Current FY [redacted] (TAB) Budget: $600,000/year	c. Estimated Budget to completion After Current FY: $*

11. KEY ACTION AGENTS (Contractor, Participating Agency or Voluntary Agency)

a. NAME	b. CONTRACT, PASA OR VOL. AG. NO.
N/A	-

I. [redacted]

A. ACTION (X)	B. [redacted]	C. [redacted]
[redacted]	B. RED comments upon ending of RED Funding of AVRDC	

The most persistent problem which AVRDC will continue to face is caused by international political realities; diplomatic recognition of the Peoples Republic of China(PRC) by an increasing number of countries and the related severing of formal government ties with the Republic of China(ROC). Though, with the hopefully-temporary exception of Thailand, contributions from the AVRDC member countries have been unaffected by such politics, some potential avenues of funding, particularly from the governments of certain developing countries, have been closed, specifically due to the fact that AVRDC is located on Taiwan. In the case of Thailand, which recently broke diplomatic relations with ROC, the 1976 contribution to AVRDC is in the RTG budget, but the government is presently reluctant to transfer the funds to AVRDC because Thailand can no longer send an official representative to the AVRDC Board Meeting or for any other official business on Taiwan.

AVRDC leadership, the concerned individuals in the member country governments, Asian Development Bank(ADB), RED, and TA/AGR all have been, and continue to be fully aware of present and potential implications for AVRDC of ROC/PRC political problems and all have, with varying degrees of success, worked to help AVRDC counter the problem (see particularly Appendix B re: present and potential linkages). RED is hopeful that such efforts will continue, particularly efforts to broaden the base of AVRDC's financial support and thereby lessen the financial share of (continued on attachment)

D. REPLANNING REQUIRES N/A REVISED OR NEW: ☐ PROP ☐ PIP ☐ PRO AG ☐ PIO/T ☐ PIO/C ☐ PIO/P

E. DATE OF MISSION REVIEW -

PROJECT MANAGER: TYPED NAME, SIGNED INITIALS AND DATE

Robert E. Gaul, RED June 15, 1976

MISSION DIRECTOR: TYPED NAME, SIGNED INITIALS AND DATE

Thomas C. Irvin, Director June 15, 1976

Co-drafted by: Frank W. Sheppard, Asst. Director for Agriculture, USAID/Philippines,

I. B. RED comments upon ending of RED Funding of AVRDC(continued)

ROC, a point which the RED representative has strongly presented at AVRDC Board Meetings.

Concerning the Outreach Program, it is noted that due to the very specific requirements of the Korean government a Senior Scientist has not yet been hired for the Outreach/Korea Center. Such lack cannot but hinder the Center's work to some degree. Also, the ADB grant to the three Outreach Centers was for two years. Hopefully, AID can assist in helping to see that the Outreach Program continues to receive at-least-the-same-level (or higher) funding when the present ADB grants expire, either from the ADB or elsewhere.

RED has kept all RED-funded (past and present) regional development institutions informed of the progress towards full operation of the AID/IBM-funded Regional Computer Center(RCC) in Bangkok, Thailand. Serious consideration should be given to utilization by AVRDC of the RCC where applicable and, more importantly, transmittal of significant research findings to RCC for storage in the RCC Information Center, where such data would be readily accessible to all users, many of whom would not be able, for political reasons, to go to AVRDC to get such information.

Last, but not least, readers should note that this PAR was written at AVRDC jointly by the RED project manager, the chief Agriculture Officer of a Southeast Asia bilateral AID Mission, and an Associate Director of the Office of Agriculture, Bureau for Technical Assistance, AID/Washington. RED conceived such a team approach to PAR-writing, and very highly recommends it to all AID Missions, bilateral or regional.

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II. PERFORMANCE OF KEY INPUTS AND ACTION AGENTS

A. INPUT OR ACTION AGENT [redacted]	B. PERFORMANCE AGAINST PLAN: UNSATISFACTORY 1 2	SATISFACTORY 3 4 5	OUTSTANDING 6 7	C. IMPORTANCE FOR ACHIEVING PROJECT PURPOSE (X): LOW 1	MEDIUM 2 3 4	HIGH 5
1. AVRDC			X			X
2. -						
3. -						

Comment on key factors determining rating

Very common observation by objective knowledgeable observers is that AVRDC in first five-year period (1971-75) developed extraordinarily fast, particularly given the fact that the first half of the period was concerned with preparatory activities such as recruitment of scientific and administrative staff, physical plant construction, and development of the experiment farm land. All of these activities were of course essential precedents to development of research, training, and Outreach activities. AVRDC employs 350 persons, 94 of whom are scientific personnel. The highly qualified senior staff comprises fifteen individuals from eight countries, but such quality would not have been attained without the existence of certain (continued on attachment)

	1	2	3	4	5	6	7	1	2	3	4	5
4. PARTICIPANT TRAINING												

Comment on key factors determining rating

N/A

	1	2	3	4	5	6	7	1	2	3	4	5
5. COMMODITIES							X					X

Comment on key factors determing rating Due to the combination of guidance by a Director with long experience who knew what commodities to order, and a first-rate Executive Officer with equally long experience in how to solicit price quotations, order commodities, and expedite their delivery through local air and sea ports, the necessary high volume of very diversified commodities have arrived, with few exceptions, when (continued on attachment)

		1	2	3	4	5	6	7	1	2	3	4	5
6. COOPERATING [redacted] countries	a. PERSONNEL N/A												
	b. OTHER				X								X

Comment on key factors determining rating As is the case with vast majority of regional projects funded in whole or part by governments of some or all of the regional countries which will benefit most from project output, the record of the six non-U.S. participating countries over the five-year 1971-75 period was mixed (in parentheses below is total 1971-75 cash input, and as percentage of total cash input from all sources):

Japan - ($305,000-3.4%) Did not commit government to specific $ value input, but contributed cash, personnel, and some commodities.

Korea - ($225,000-2.5%) Refused to commit any funds until assured, in mid-1973, that an outreach station would definitely be located in Korea. Subsequently contributed $75,000 per year for last three years of period.

Philippines - ($375,000-4.2%) Was slow getting started with contributions, but caught up, and on at least one occasion contributed a 2-year amount ($150,000) in advance. (continued on attachment)

	1	2	3	4	5	6	7	1	2	3	4	5
7. OTHER DONORS					X				X			

(See Next Page for Comments on Other Donors)

II.A. 1. Comment(continued)

household amenities supplied by AVRDC (such amenities were, incidentally, criticized by AID-AAG in Audit Report #8-498-74-64 dated March 29, 1974. That criticism was responded to by RED in straight-forward fashion).

AVRDC cannot, for political reasons (see part II. 1. B.), attain full membership in, or any funding from, the Consultative Group on International Agricultural Research(CGIAR) as do all other associated international agricultural research institutes. In spite of such a unique handicap, AVRDC vigorously moved ahead on a broad front to establish varying degrees of working relationships with national, regional, and international development institutions. The AVRDC linkages with several institutions/organizations have been considerably facilitated by RED; i.e., the Asian Institute of Technology(AIT-Bangkok, Thailand) Agricultural Engineering Dept., and three Southeast Asian Ministers of Education Organization(SEAMEO) institutions: Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA-Los Banos, Philippines). Regional Center for Tropical Biology(BIOTROP-Bogor, Indonesia), and the Indonesian National Center (Jakarta-nutrition education) of the regional Tropical Medicine and Public Health Project(TROPMED-National Centers in five Southeast Asian countries).

The Outreach Program is a key part of AVRDC. With funds from the Asian Development Bank, two AVRDC national Outreach stations, at the Horticultural Experiment Station of the ROK Office of Rural Development at Suweon, Korea and at Los Banos, Philippines (the latter with a close working relationship with SEARCA and the COP's Bureau of Plant Industry) have been established. A planned Thailand Outreach station has been delayed due to certain Thailand/Taiwan political considerations, though some training and seeds have been provided by AVRDC. Additionally, AVRDC working contacts of varying degrees of substance and potential have been established with agricultural officials/organizations/institutions in Japan, Malaysia, Indonesia, Singapore, Papua New Guinea, India, Pakistan, Jordan, and Saudi Arabia (see Appendix B for Outreach/other linkages details).

As planned, the AVRDC Training Program got started in the spring of 1975, and eleven research interns or scholars from six countries completed training by the end of the year (see Appendix D).

II. A. 1 Comment (continued)

AVRDC has employed a full-time Information Officer since mid-1974. The 1974 Annual Report was distributed to more than three thousand extension workers, libraries, researchers, development organizations, etc., worldwide, as was a very informative but concise brochure. The AVRDC library contains about 3,000 titles, subscribes to almost 300 journals, and maintains close links with libraries of other international agricultural centers.

Research at AVRDC is accomplished through a unique multidisciplinary approach and organized into three programs: Vegetable Legumes, Horticultural Crops, and Nutrition/Environment/Management. The disciplines represented in those programs are Agricultural Economics, Chemistry, Crop Management, Entomology, Breeding, Pathology, Physiology, and Soil Science. Each crop has a Crop Coordinator, and a Land Committee oversees the use of the experimental fields. AVRDC early selected six crops of priority importance to Asia to concentrate efforts on: soybean, mungbean, tomato, Chinese cabbage, sweet potato, and white potato. Technical detail of the excellent progress that has been made in a relatively brief span of time is provided in Appendix A.

Commercial production of the six AVRDC crops in any particular locality is naturally limited by availability of a market outlet that will accept delivery of output as products mature (or according to a schedule) and at a price that will encourage farmers to produce. Two survey studies of market linkages have been published by AVRDC; the first was entitled "Taiwan's Specialized Vegetable Production Area - an Integrated Approach", and the second was concerned with tomato production and marketing in southern Taiwan. This aspect of Center work will be accelerated, and extended to other countries in the region. AVRDC is located in an export-oriented intensely-cultivated commercial tomato production area, and AVRDC staff and trainees benefit substantially from the opportunity to interact with and study the grower-processor relationships and the implications of such relationships for production methodology.

II A. 5. Comment (continued)

the related staff and physical facilities were ready. AVRDC also acquired, with comprehensive AID assistance, $49,474 worth of U.S. military excess property from Japan and Okinawa -- a total of sixty line items with an original acquisition value of $94,397.

II. A. 6. Comment (continued)

Thailand - ($375,000-4.2%) Contributed programmed $75,000 each year.

Vietnam - ($8,000-.09%) Contributed a token $2,000 annually until the change of government in April, 1975.

Republic of China - ($3.6 million-40.9%) Contributed the site ($790 thousand value is included in preceding $3.6 million figure) and a steadily increasing amount of funds over the five-year period, including funding the cumulative budget deficit, to which none of the other cooperating governments contributed. (see Appendix C for Projected Member Government Inputs to 1976-80 Core Budget)

Due to member governments differing fiscal years and other considerations, these government contributions tended to be dispersed throughout the calendar year, making it somewhat difficult for AVRDC to plan ahead concerning fund receipts.

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II. 7. Continued: Comment on key factors determining rating of Other Donors

A few substantial amounts were contributed by other (i.e., other than regional governments) donors over the five-year 1971-75 period, for ex.:$300,000 from Kresge Foundation, $50,000 from Rockefeller Foundation (plus payment of the Director's salary each year), $690,000 from Asian Development Bank, $250,000 from Taiwan Canners Association, $42,500 from International Minerals and Chemical Co., and numerous lesser amounts. It is condidently expected that as AVRDC becomes better known, such private sector contributions will increase (see Appendix B re:linkages).

III. KEY OUTPUT INDICATORS AND TARGETS

A. QUANTITATIVE INDICATORS FOR MAJOR OUTPUTS	N/A	TARGETS (Percentage/Rate/Amount)					
		CUMULATIVE PRIOR FY	CURRENT FY TO DATE	CURRENT FY TO END	FY ____	FY ____	END OF PROJECT
-	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						
-	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						
-	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						
-	PLANNED						
	ACTUAL PERFORMANCE						
	REPLANNED						

B. QUALITATIVE INDICATORS FOR MAJOR OUTPUTS	COMMENT:
1. Development of research training capability of AVRDC.	Most of senior and supporting scientific staff in place, with needed basic field and laboratory facilities available. The highly-experienced Training Officer, and 70% of the researchers, are Asians. Training program became operational in 1975 (see Appendices B & D).
2. see attachment	COMMENT: see attachment
3. see attachment	COMMENT: see attachment

III B. Indicators and Comments

2. Development/expansion of research extension competence in less-developed member countries (Korea, Philippines, Thailand, Republic of China), other Asian countries such as Malaysia and Indonesia, and perhaps certain non-Asian countries (preliminary discussions have been held with in Papua-New Guinea, Jordan, Bahrein, and Saudi Arabia)

Comment: Outreach program commenced in Korea in 1974 and in Philippines in 1975. Training of regional students commenced in Spring, 1975(see Appendices B & D). Frequent consulting visits of senior AVRDC scientists to member countries and other regional countries such as Malaysia, Singapore, and Indonesia. Large numbers of seed shipments to scientists in cooperating countries. (see Appendix B)

3. Applied and adaptive research on vegetables.

Comment: Unique multidisciplinary research programs developed on the six priority crops selected for initial emphasis, with attention given to increased yield potential and nutritional quality. Due large germplasm collections, scientists able identify materials with significant resistance to major insect pests and diseases, with heat tolerance, and improved nutritional qualities, and these desirable traits being utilized in breeding programs. Important work underway on pesticide residues and management practices. Economic research on production and marketing becoming important part AVRDC program. (see Appendix A)

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IV. PROJECT PURPOSE

A. 1. Statement of purpose as currently envisaged. 2. Same as in PROP? ■ YES ☐ NO

To create a regional vegetable research center that will improve, through applied and adaptive research, training, and outreach/extension technical assistance the nutritional quality, productivity, and availability of selected vegetables and vegetable products in participating countries, and thus provide an institutional capability to improve the diets of their populations.

B. 1. Conditions which will exist when above purpose is achieved.	2. Evidence to date of progress toward these conditions.
a) AVRDC capacity to conduct multidisciplined research on several vegetable species simultaneously to increase productivity; reduce production risk; perfect seed multiplication, storage and distribution practices; and develop cropping systems that respond to market demand.	a) Six crops selected, multidisciplined research staff recruited and at work, gene bank established that contains desired nutritional qualities, breeding work progressing with test lines identified that possess improved productivity potential, increased degree of biologic resistance to diseases and insects, and relative insensitivity to day length.
b) Capacity to conduct training programs for research scientists, production specialists, and trainers of extension workers.	b) During last eight months of calendar 1975, 42.5 intern/scholar months of training completed in plant breeding(7 trainees), crop management(3 trainees) and experimental farm management(1 trainee). Trainees came from six Asian countries and eight agencies (see Appendices B & D).
c) Operate outreach technical assistance in participating country vegetable research and production programs.	c) see attachment
d) see attachment	d) see attachment

V. PROGRAMMING GOAL

A. Statement of Programming Goal To raise the level of cooperation in vegetable research and extension activities among nations in the region, particularly AVRDC member nations, to: (1) improve diets by increasing the availability of high quality vitamins, proteins, fats and oils, and minerals from selected vegetable sources and; (2) increase small farmers income through improvement of productivity and introduction of new cropping systems that can diversify vegetable output in response to effective market demand.

B. Will the achievement of the project purpose make a significant contribution to the programming goal, given the magnitude of the national problem? Cite evidence.

Progress toward achievement of the Project Purpose will make a contribution to the Programming Goal by lifting many of the important technical constraints to increased vegetable production. Significant contributions are anticipated within the next five years as results of present breeding and management research become more widely available to farmers. Resultant increased land and labor productivity should lower the farmer's per-unit costs of production, offering him a substantial economic incentive to increase annual production. An increased supply of improved quality vegetables available during more months of the year at stable prices could enable many consumers to enjoy more healthful food on a year-round basis. However, though the development of considerably improved production technology in line with the Project Purpose is a prerequisite to attaining the nutrition improvement objective stated in (1) above, whether or not such widespread improvement of nutrition will result will be due to factors beyond the present scope of this project. (However, AVRDC is getting (continued on attachment)

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IV. Project Purpose(continued)

B. 1. Conditions which will exist when above purpose is achieved.(continued)	2. Evidence to date of progress toward these conditions.(continued)
	c) Korea Outreach Program commenced May, 1974, and Philippines Program in May, 1975. Full operation of the Thailand program has been delayed due to certain RTG/ROC political considerations, though some consultation visits to Thailand have been made by AVRDC scientists, some AVRDC seeds shipped to Thailand, and four Thai students trained at AVRDC. Continuing and comprehensive assistance provided to Taiwanese research and extension workers since 1972.
d) Participating countries, with AVRDC assistance, establish, staff and equip multidisciplined teams of applied research workers for vegetable crops.	d) Status chart: (see below)

	Tomato	Sweet Potato	Mungbean	Soybean	Chinese Cabbage	White Potato
Taiwan	F	F	F	F	F	P
Korea	S	N	S	P	P	P
Philippines	F	P	F	F	S	S
Thailand	P	N	S	P	N	S

"F" = Full multidiscipline research team
"P" = Partial team
"S" = Scientist-to-scientist exchange of breeding materials and information
"N" = No research exchange work with AVRDC

V. PROGRAMMING GOAL

B. (continued)

considerably more involved in nutrition activities and developing working relationships with various relevant organizations including, with facilitation by RED, AID/Washington's Office of Nutrition in the Technical Assistance Bureau). Examples of such factors are nutritional ignorance, poverty, and lack of motivation; and these could well delay to varying degrees, dependent on local conditions, full accomplishment of the nutrition aspects of the Program Goal.

In localities where production expands more rapidly than effective market demand, farmers may be denied the expected increased income. National government policy interventions in the community production system to affect prices and levels of production are outside the present influence of this project. But, AVRDC surveys of marketing systems can identify grower-processor or wholesaler contractual relationships that offer organized grower groups an opportunity for gaining some control over price risk. General improvement of small farm income might be accomplished more expeditiously through introduction of new export crops or expansion of traditional exports without necessarily securing the desired improvement in national and regional nutritional levels. Securing rapid progress toward achievement of both aspects of the Programming Goal (listed in A.) in participating countries requires successful attainment of the research/training/extension "project purpose" goals.

CROPS RESEARCH

Soybean

The collection has more than 9,000 accessions; in 1975, 3,960 accessions from seven countries were added, and samples and new breeding materials were sent to 49 cooperators in 20 countries. A large on-going breeding program involved in 1975 more than 2,200 crosses and evaluation of some 20,000 lines. Good progress has been made in identification of sources of resistance to major diseases and insect pests.

Mungbean

While an important food crop in Asia, the mungbean has not received the kind of research attention that has been directed to many other food crops. Average yields are low and there are numerous insect and disease problems. In 1975 AVRDC made 409 crosses. Progress has been made in finding resistance to a complex of root diseases. Research has shown that nitrogen fixation by the roots dropped off sharply by the beginning of the flowering stage (when N requirement rises sharply). This is serious and will be studied further. AVRDC mungbean germplasm has been shared with scientists in 15 countries. AVRDC has recently taken responsibility for the International Mungbean Nursery, previously handled by an AID-supported project at the University of Missouri.

Tomato

Production in the tropics is beset by many handicaps, principally those of disease susceptibility and of poor fruit set in hot weather. These problems are so severe that in the lowland tropics almost no tomatoes are grown during the hot rainy season. Striking progress has been made in introducing resistance to bacterial wilt (the most important disease) into new lines. Also sources of resistance have been found to root knot nematode as well as to three other diseases. In 1975, 3,745 accessions were screened for tolerance to high temperature, of which 22 were found with medium to heavy or heavy fruit set when night temperatures equalled or exceeded 23°C.

Chinese Cabbage

This popular crop, although well-adapted to higher altitudes and cooler seasons, does not form heads in hot weather and is readily attacked by several serious diseases and many insect pests. AVRDC scientists hope to develop - as has already been done for the common cabbage - new heat-tolerant, disease-resistant varieties. These problems are being studied intensively, and sources of resistance have been found to bacterial soft rot, downy mildew and turnip mosaic virus. Segregating populations have revealed several heat-tolerant materials with heads triple the size of those of their heat-tolerant parents. There is promise of an early pay-off in this research.

Sweet Potato

More people can be fed at acceptable nutritional levels from a hectare of sweet potato than from a hectare of rice. AVRDC is developing varieties that can produce roots containing high amounts of protein and B-carotene (the precursor to vitamin A). Varieties with high yield potential and early maturity are being screened under low input conditions. Seven selections produced computed yields of 30 tons/hectare or more when grown without fertilizer, pesticides and irrigation.

White Potato

This crop does not do well at low elevations in the tropics. AVRDC, in cooperation with the International Potato Center(CIP) in Peru, is making a major effort to develop a white potato that will form tubers under tropical conditions, particularly during the hot, rainy months. Thirty selections from segregating populations have produced marketable tubers under high temperatures in summer trials.

OUTREACH PROGRAM DEVELOPMENT

Korea

The Korean Sub-Center, formally established in 1974, continued to evaluate AVRDC breeding lines and made progress toward the improvement of four crops for Korean conditions.

Korean trainees have already begun their instruction at AVRDC under the sponsorship of the Outreach program. Mr. Soo Seong Lee has just returned to the Horticultural Experiment Station in Suweon after 8 months of training as a research intern in plant breeding. Mr. Yoon Jin Young and Mr. Young Hyun Kwang are now plant breeding research interns, working on Chinese cabbage and soybean, respectively.

Chinese cabbage selections were made from the 1974 crossing combinations, and field plantings were made in June, July, and August. Serious damage caused by Turnip Mosaic Virus(TuMV) was observed especially in the late plantings, but some varieties resistant to both soft rot and TuMV were identified.

Soybean selections for vegetable use were made from 85 new accessions and 12 lines were advanced from 1974 trials. Most AVRDC lines were susceptible to bacterial diseases and were 7 to 10 days later than standard varieties, but some tolerance to the Tobacco Ring Spot Virus was observed. Many AVRDC lines had high pod numbers but yielded only 60 to 70% of the Kwangkyo checks.

Tomato lines were screened for both heat and cold tolerance and disease resistance involving 222 lines for field conditions and 65 for greenhouse culture. Five varieties were identified with useful characteristics for growing in the winter season. During summer trials, crosses were made between virus-resistant and heat-tolerant types, but most had small fruits and were of determinant growth type.

White potato trials with polyethylene film mulching showed that emergence was advanced by 10 to 15 days by planting sprouted tubers in plastic mulched beds. Early harvest yields were increased 40 to 80% by these techniques, but differences were small when mulch was removed late or with later harvest dates.

Philippines

Dr. John N. Hubbell, from Lousiana State University, arrived in the Philippines in May, 1975 to initiate the AVRDC Philippines Outreach Program(POP) at the Economic Garden in Los Banos. The Program is jointly supervised by the Bureau of Plant Industry(BPI) and the Philippine Council on Agricultural and Resources Research(PCARR). Backstopping administratively has been worked out with the Southeast Asian Regional Center for Graduate Study and Research in Agriculture(SEARCA) Los Banos, one of the six Southeast Asian Ministers of Education Organization(SEAMEO) Centers. AID through RED has, over several years, invested very substantial funds in SEARCA. Both PCARR and BPI contributed land, labor, technicians, and supporting supplies and excellent cooperation was obtained from the Economic Garden and associated workers.

In addition to BPI and University of the Philippines contacts, Dr. Hubbell has initiated contacts throughout the Philippines with educational and research institutions, and at least 13 of these agreed to cooperate in the AVRDC testing and training programs.

POP has vigorously pursued training activities and 9 trainees have been sponsored at AVRDC during the first 12 months.

Research trials were planted with seeds or planting materials sent from AVRDC involving all six crops. Thirteen trials were planted during 1975 and results are reported in the 1975 AVRDC Annual Report.

Mungbean trials were harvested and showed high yields with at least one introduction not of Philippine origin. Significant differences were measured in resistance to both Cercospora leaf spot and virus.

Tomato plantings in the rainy season were severely infected with bacterial wilt and a few lines with resistance were indentified. Plantings in November produced good fruit set as expected during the cool season.

Sweet potato introductions from AVRDC were largely successful, but some trials displayed possible virus disease symptoms and planting materials were not uniformly viable.

Thailand

A submission of documents was made by AVRDC to the Royal Thai Government, but the Technical Assistance Agreement required by the Asian Development Bank has not yet been signed. However, cooperation on an informal, scientist-to-scientist basis continues.

The cooperative program with Chiang Mai University was one of the first initiated by AVRDC. Although several crops have been planted, the most significant achievements have been made in conjunction with Mrs. Manee Vivutvongvana on the development of a heat-tolerant and bacterial wilt-resistant tomato. Additional work has been done with AVRDC tomato and sweet potato germplasm at Kasetsart University and with scientists in the Ministry of Agriculture at the Fang, Rangsit, Chainat, and Mae Jo Experiment Stations. At present, 644 pedigree soybean lines from 77 crosses made at AVRDC are planted on two hectares of land at the latter station. These have either disease resistance, high yield potential, or photoperiod insensitivity.

Three staff members of Khon Kaen University received training at AVRDC in 1975. Mr. Chairerg Sagwansupyakorn in now a research intern in the Horticultural Crops Program, and when he returns to Thailand he will be employed by the Horticultural Department of Kasetsart University. One employee of the Ministry of Agriculture, Miss Sivaleeporn Dejavakul, began a training program but had to leave before completion when the Government of Thailand requested her return. In late 1976, Aphiphan Pookpakdi, a Thai graduate student in agronomy at the University of Missouri, will conduct his dissertation research on soybean at AVRDC. He will be jointly sponsored by AVRDC and the Rockefeller Foundation. This will be the third graduate student to do thesis research at AVRDC.

In February 1976, AVRDC and INTSOY(International Soybean Program, University of Illinois) co-sponsored a conference with the Government of Thailand on "Expanding the Use of Soybeans", which was held in Chiang Mai. Over 250 scientists from 19 countries participated. It will probably be recognized as the meeting that began true regional cooperation among scientists at Asian institutions in soybean research.

INTERNATIONAL LINKAGES

It is naturally disappointing that AVRDC does not receive financial assistance through the organization which provides the major support for the other International Agricultural Research Institutes, i.e., the Consultative Group for International Agricultural Research(CGIAR). It was originally envisioned that AVRDC would be included in the group of CGIAR-sponsored centers. Because AVRDC was adequately funded regionally and located in Taiwan, the CGIAR did not recommended that AVRDC receive

support through its auspices[x]. AVRDC was accorded Associate Membership in the CGIAR entitling it to participate in all the review and interchange facilities of the CGIAR. Consequently, the results of AVRDC's research programs are presented each year by the Director to the CGIAR Meeting held at the World Bank in Washington, D.C.

The Directors of the International Agricultural Research Institutes (IARI) have always considered AVRDC to be a full participant in their meetings. The AVRDC Director joins the other Directors twice a year to review programs of mutual interest and to standardize procedures and perquisites. After their next meeting in May, 1976, the Institute Directors will conduct an on-site review of the AVRDC facilities and programs.

AVRDC has its most direct IARI linkage in crop research with CIP, the International Potato Center in Lima, Peru. Exchanges of plant materials have taken place and scientists have also exchanged visits. CIP has recently strengthened its staff in Asia by staffing a regional office in Korea.

Cooperation with IRRI(International Rice Research Institute, Los Banos, Philippines) centers on stimulating inclusion of high-value nutritious crops in the multiple cropping programs and in cooperation by IRRI scientists in testing AVRDC crops in some outreach locations.

The Grain Legume Improvement Program at IITA(International Institute of Tropical Agriculture, Ibadan, Nigeria) serves as a source of germplasm exchange and several scientists have an interest in the sweet potato and other crops in the Farming Systems approach being used in Africa. In a few cases, common collaborators in research testing have been developed.

AVRDC has agreed to accept the responsibility for supervising the International Mungbean Nurseries, a program initiated by the University of Missouri in 1972. It may also assume the responsibility for the planning of the INTSOY varietal trials throughout Asia.

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x/ A similar action was taken by the CGIAR in 1973 when it declined to finance INTSOY. In this case, the reasons given were INTSOY's adequate financing and its location in a developed country.

REGIONAL LINKAGES

A cooperative agreement was signed in early 1975 by the Directors of SEARCA and AVRDC to promote the training of agricultural scholars throughout Asia with emphasis on ASEAN countries. This agreement provides for a broad range of general cooperation in training, research, conference, and information exchange.

Now that the Agricultural Development Council(ADC) has moved its offices to Singapore, it is anticipated that AVRDC will intensify its involvement in ADC programs. The President of the ADC, Dr. Vernon W. Ruttan, was elected to the AVRDC Board of Directors in 1975.

The Asian Development Bank(ADB) provides financial support to AVRDC Outreach programs in three countries in the region. These activities are detailed above. ADB support to AVRDC has been strong from the start and is continuing to assist several countries to take advantage of technical innovations resulting from AVRDC research. It is intended that additional funds be sought for this use and that continuing support be requested in cases where funding from other sources is not available.

AID financial support for AVRDC was originally received through AID's Regional Economic Development Office(RED) in Bangkok from 1971 through 1975. Dr. Fletcher Riggs, chief Agriculture Officer for USAID/Thailand (RED did not have an Agriculture Officer), served as the AID Board member for the first five years, with the RED AVRDC Project Manager attending all Board Meetings in Observer status. Starting in CY1976, AID funds for the AVRDC program come through the Technical Assistance Bureau(TAB) in Washington in the same fashion as the funding for the other International Agricultural Research Centers. Collaboration with RED and with RED-supported (past and present) regional institutions such as the Asian Institute of Technology(AIT), Bangkok, Thailand; the SEAMEO Southeast Asian Center for Tropical Biology(BIOTROP), Bogor, Indonesia; the Asian Institute of Management(AIM), Manila, Philippines; SEAMEO/SEARCA, Los Banos, Philippines; the SEAMEO/TROPMED Nutrition Center, Jakarta, Indonesia; and others will continue and is being significantly facilitated by RED.

Support for regional activities is being negotiated with the Asia Foundation. They have expressed an interest in helping finance scholarships, an economic survey, and an international conference on mungbean.

NATIONAL LINKAGES

Japan

The Government of Japan provides both direct support to the core program budget and a Soil Scientist. Dr. Yoshida, who was the AVRDC Soil Scientist for three years, has been replaced by Dr. Takayudi Yoshizawa. In addition, cooperative research with Kyushu University will begin soon. A jointly-planned experiment will be conducted in the University's phytotron to separate and identify temperature and photoperiod effects on the flowering date of soybean.

The Japan International Cooperation Agency(JICA) has been asked to increase the financial assistance by Japan and to provide a Soil Microbiologist. AVRDC also expects to request individual items of equipment and consultants.

Malaysia

Discussions of AVRDC involvement in an outreach activity in Malaysia were held last November with the Director of Malaysian Agricultural Research and Development Institute(MARDI) in Serdang. After a review of programs and an exchange of visits, it was agreed to initiate a program along the same lines as other projects supported by the Asian Development Bank. Documents have been prepared and are in the process of review. The basic idea has been tentatively approved by the MARDI Governing Board and submission will soon be made to ADB by the Economic Planning Board if final approval is obtained.

The project will initially be devoted to research on tomato and Chinese cabbage and will be located at a new station in Pontain with counterpart support from the Western Johore Agricultural Development Project. Submission to ADB is targeted for October, 1976. Trial plantings of tomato have been made at Jalan Kebun in Selangor and at Tarat in Sarawak. Other direct exchange is expected to accelerate.

Indonesia

AVRDC discussions with the GOI Director of Agricultural Research, Director of the Central Agricultural Research Institute, and with BAPENAS, resulted in an invitation to participate in a program. Little progress

to date can be reported but intentions have been expressed to participate in either ADB or World Bank (IBRD) funded projects when a clear statement of objectives and priorities has been developed. Correspondence has been exchanged with the new International Agricultural Development Service (IADS), which has expressed interest in managing a project in agricultural research and extension in Indonesia.

The first trainee sent to AVRDC from Indonesia, Mrs. Hafni Z. Syukri, arrived in 1975. She was a plant breeding research intern and has completed her training and returned to the Horticultural Research Station on the out-skirts of Jakarta. Two other Indonesian trainees, Subandi Kemawidjaja and Antoro Wasito, are enrolled in AVRDC's first production training course, which began in February and will end in July.

Singapore

Cooperative work was initiated with the Department of Primary Industries in 1975. From the results of a tomato trial, the development of a cultivar with both heat tolerance and resistance to bacterial wilt for Singapore looks promising.

Papua New Guinea

Cooperation has been limited to the introduction of several lines of sweet potato with high levels of protein and beta-carotene. It is planned to enroll a trainee in the second production training course beginning in August, 1976. One of the AVRDC Associate Directors went on a working visit to several areas of Papua New Guinea in late April, 1976.

India

Several AVRDC trials have been planted at ICRISAT(International Crops Research Institute for Semi-Arid Tropics, Hyderabad, India). During his recent visit, Mr. Shanmugasundaram, the AVRDC Soybean Coordinator, found considerable interest in Madras among government and private industry representatives in cooperating with the AVRDC soybean improvement program. This will be pursued and may result in the establishment of an outreach station. Mr. Hemant Bedekar, a research intern, is the first AVRDC trainee from India.

Pakistan

Dr. Akhtar Khwaja, a research fellow in soil science and crop management, is the first AVRDC trainee from Pakistan. He is currently conducting research on the nitrogen-fixing ability of soybean. AVRDC hopes to increase involvement in Pakistan's agricultural development.

Jordan

Plans for AVRDC to assist Jordan's national agricultural development program are currently under study. A Memorandum of Understanding was signed in the Fall of 1975, pledging both parties to mutual assistance.

Saudi Arabia

In connection with the request to the Kingdom of Saudi Arabia for support to the core budget, AVRDC has proposed to establish an Outreach program at several locations in the country in cooperation with the Ministry of Agriculture and Water. Dr. Mansur M. Aba-Husayn of the University of Riyadh, Faculty of Agriculture, visited AVRDC on March 10 to discuss the proposal, to see the AVRDC campus, and to review research programs. Upon his return to Saudi Arabia, he will be reporting to the Ministry of Agriculture and Water on the results of his visit.

HOST COUNTRY RELATIONSHIPS

The Republic of China(ROC) is now the largest donor to the AVRDC core budget, providing 36% of all the funds received. As important as this funding is to AVRDC, it may not be the most significant contribution of the ROC to the development of Asian agriculture. The exposure to the methods used by Taiwan farmers is an invaluable contribution. The intensive planting and the excellent cultural management employed by the local farmers make a lasting impression on the young agriculturalists being trained at AVRDC. It is the quality of the ROC universities and their graduates that has enabled AVRDC to make such rapid progress in its research programs. The local research institutions may give AVRDC stiff competition for staff, but they also offer centers of excellence with which AVRDC can develop mutually beneficial cooperative research programs. Perhaps few other International Agricultural Research Centers are able to work with such high quality institutions in their host country. The ROC also contributes the skills of its young scientists, technicians, clerical, and secretarial staff to AVRDC.

A number of cooperative programs with ROC institutions or firms have been initiated recently. Conferences and cooperative project research are being organized with Academia Sinica, JCRR(Joint Commission on Rural Reconstruction), District Agriculture Improvement Stations, Taiwan Agricultural Research Institute, National Taiwan University, and National Chung Hsing University.

May, 1976 AVRDC Project Appraisal Report(PAR)

THE ASIAN VEGETABLE RESEARCH AND DEVELOPMENT CENTER

Projected Member Government Inputs to 1976-80 Core Budget

($U.S.)

Donor Nation	1976	1977	1978	1979	1980	Total	Contribution %
Republic of China	693,500	143,600	794,300	848,600	906,600	3,986,600	36
United States of America	600,000	600,000	600,000	600,000	600,000	3,000,000	27
Republic of the Philippines	75,000	75,000	75,000	75,000	75,000	375,000	3
Republic of Korea	75,000	75,000	75,000	75,000	75,000	375,000	3
Government of Japan	75,000	75,000	75,000	75,000	75,000	375,000	3
Kingdom of Thailand	75,000	75,000	75,000	75,000	75,000	375,000	3
Carry over	257,726	—	—	—	—	257,726	2
Total	1,851,226	1,643,600	1,694,300	1,748,600	1,806,600	8,744,326	

AVRDC Research Interns/Scholars Completing Training During 1975

Trainee	Agency/Country	Period	AVRDC Dept.
1. Sorot Chindaprasert	Khon Kaen University Thailand	2 months	Plant Breeding
2. Thomya Thongluang	Khon Kaen University Thailand	2 months	Plant Breeding
3. Thosporn Hemapat	Khon Kaen University Thailand	2 months	Crop Management
4. (Miss) Sivaleeporn Dejanakul	Dept. of Agriculture Thailand	4 months	Plant Breeding
5. Servillano R. Gumasing	U.P. College of Agric. La Granja, Philippines	4 months	Plant Breeding
6. Francisco Mercado	Philippine Sugar Institute Philippines	6 months	Plant Breeding
7. Lorenzo A. Margate	Central Mindanao Univ. Philippines	2 months	Expt. Farm Management
8. (Mrs.) Hafni Z. Syukri	Lembaga Penelitlan Horti-kultura, Indonesia	4 months	Plant Breeding
9. Ruben S. Dayrit	Dept. of Education USTTrust Territory Micronesia	1.5 months	Crop Management
10. Clifford Munroe	East-West Center, Univ. of Hawaii, USA	7 months	Crop Management
11. Soo Seong Lee	Horticultural Experiment Station, Korea	8 months	Plant Breeding

AVRDC Research Interns/Scholars Currently (May, 1976) Enrolled

Trainee	Agency/Country	Title	Period
1. H. S. Bedekar	Nimbkar Agric. Rsch. Inst. India	Rsch. Assist.	5 months
2. E. M. Catipon	BPI Econ. Garden Philippines	Horticulturist	4 months
3. E. Corinles	Crop Rsch. Div., PCARR Philippines	Prog. Spec.	6 months
4. Y. H. Hwang	Rural Devel. Office Korea	Jr.Agron.Rschr.	6 months
5. Y. C. Kuo	Taiwan Sugar Corp. Republic of China	Chem.Engr.	6 months
6. R. R. Matias	BPI Econ. Garden Philippines	Agronomist	4 months
7. C. Sagwansupyakorn	Kasetsart Univ. Thailand	--	6 months
8. J. Y. Yoon	Rural Devel. Office Korea	Jr. Rschr.	6 months
9 J Deutsch	Cornell University USA	Ph.D. Cand.	12 months
10. A Khwaja	Pakistan	Ph.D. Cand.	12 months
11 Y. H. Chang	Taiwan Seed Service Republic of China	Director Ext. Prog.	4 months
12. T. L. Chen	Hsinchu Agric. Station Republic of China	Jr. Spec.	4 months
13. R. G. Flores	Nat. Food/Agric. Council Philippines	Prov.Prog.Off.	4 months
14 S. L. Hwang	Tainan Agric. Station Republic of China	Jr. Spec.	4 months

AVRDC Research Interns/Scholars Currently (May, 1976) Enrolled

Trainee	Agency/Country	Title	Period
15. A. Mabesa	U.P. College of Agric. Philippines	Rsch. Assoc.	4 months
16. A. Macaso	Cent. Luzon State Univ. Philippines	Instructor	4 months
17. C. E. Magboo	PCARR Philippines	Agric. Spec.	4 months
18. D. V. Oria	Mindanao Inst. Tech. Philippines	Instructor	4 months
19. A. B. Ragasa	Nat. Food/Agric. Council Philippines	Prov.Prog.Off.	4 months
20. W. N. Sierra	Severino Agric. College Philippines	Instructor	4 months
21. K. Subandi	Mennonite Central Comm. Indonesia	Missionary	4 months
22. A. Wonito	Horticultural Rsch. Station Indonesia	Agronomist	4 months

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FROM - Bangkok (RED)

SUBJECT - RED: Transmittal of PAR on AVRDC

1. Attached is the AID Project Appraisal Report (PAR) on the Asian Vegetable Research and Development Center (AVRDC), Shanhua, Taiwan.

2. AVRDC is located 19 kilometers (12 miles) north of Tainan City in southwestern Taiwan on 116 hectares (287 acres), with physical plant valued at U.S.$4 million. The first AVRDC Director was Dr. Robert F. Chandler, former long-time Director of the International Rice Research Institute (IRRI), who retired in June 1975 and was succeeded as AVRDC Director by Dr. James C. Moomaw.

3. Note that the PAR is a joint effort of the RED (Southeast Asia Regional Economic Development Office, U.S. Embassy, Bangkok, Thailand) Project Manager, the chief Agriculture Officer of a Southeast Asia bilateral AID Mission (USAID/Philippines), and an Associate Director of the Office of Agriculture of the Bureau for Technical Assistance (TA/AGR), AID/Washington. RED conceived such a team approach to PAR-writing, and very highly recommends it to all AID Missions, bilateral or regional.

4. Should you wish to obtain further information on AVRDC, please write to:

Director
Asian Vegetable Research and
Development Center (AVRDC)
P.O. Box 42
Shanhua, Tainan 741
Taiwan, REPUBLIC OF CHINA

WHITEHOUSE

PAGE 1 OF 1 PAGES

DRAFTED BY	OFFICE	PHONE NO.	DATE	APPROVED BY:
Robert E. Caul	RED	-	10 June 76	Thomas C. Irvin, Director, RI

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