THE JICA PROJECT-TYPE TECHNICAL COOPERATION ON
RESEARCH AND DEVELOPMENT PROJECT ON HIGH PRODUCTIVITY RICE TECHNOLOGY
(August 1, 1997 – July 31, 2002)

Review of the Mid-term Achievement and Work Plan for the Latter Half at Midway

Presented during the Third Meeting of the
Joint Coordination Committee for the Implementation of the Project
9:00 a.m., 27 March 2000
PhilRice Central Experiment Station
Maligaya, Munoz, Nueva Ecija
Philippines

Department of Agriculture
PHILIPPINE RICE RESEARCH INSTITUTE

TABLE OF CONTENTS

I. INTRODUCTION

II. THE JOINT COORDINATION COMMITTEE FOR THE IMPLEMENTATION OF THE PROJECT

I. INTRODUCTION

1. The DA-Philippine Rice Research Institute (DA-PhilRice)

DA-PhilRice was created through Executive Order No. 1061 on November 5, 1985, and subsequently strengthened by an amendment through Executive Order No. 60 on November 7, 1986. PhilRice is a government corporation attached to the Department of Agriculture (DA), with the following basic functions: (1) to plan, undertake, coordinate and fund the national research and development (R&D) program for rice and rice-based farming systems; (2) to coordinate the national network of rice R&D stations in the different agro-ecological regions of the country; (3) to verify, package, and promote economically viable and socially acceptable rice and rice-based technologies; (4) to provide timely information for policy formulation that will stimulate rice production, marketing, and consumption; and (5) to organize, train, and develop the rice industry's manpower.

DA-PhilRice coordinates and unifies the rice R&D activities of 56 agencies working on rice, including DA experiment stations, and state colleges and universities strategically located in the country. Thus, the institute is a vital force in achieving and sustaining the country's goal of rice self-sufficiency and in promoting greater access of farmers to agricultural technology.

2. The JICA Grant-Aid for DA-PhilRice

On June 22, 1988 the Philippine Government requested a grant-aid type of assistance from the Government of Japan, through the Japan International Cooperation Agency (JICA) which provides the facilities and equipment needed to support the R&D activities of PhilRice. After a year of negotiations and planning, the request was approved on December 21, 1989. The fully equipped research complex of the PhilRice Central Experiment Station in Maligaya, Muñoz, Nueva Ecija was turned over to the Philippine government on March 15, 1991. Indeed, the grant has significantly strengthened the R&D capabilities of PhilRice, and this is considered a lasting legacy of Japan to the Filipino farmers.

3. The Technical Cooperation Projects

In support of the mandate of PhilRice and for a fuller utilization of the grant-aid project, a second JICA assistance in the form of a Project-type Technical Cooperation was proposed on May 19, 1989 and approved on March 18, 1992. Started on August 1, 1992, the five-year cooperation was designed to promote R&D activities on the improvement of rice technologies in the Philippines.

In May 1997, the governments of Japan and the Philippines agreed to have another project-type technical cooperation (T/C) entitled, "Research and Development Project on High Productivity Rice Technology". Similar to the previous T/C, the project has three components, namely:

a. dispatch of long-term and short-term Japanese experts who will collaborate with their Filipino counterparts on specific fields related to the program thrusts of PhilRice;

b. training of Filipino scientists and technicians in Japan on specific scientific fields as well as in the utilization and maintenance of the various research equipment to be provided by JICA; and

c. provision of equipment and materials needed by the Japanese experts and their Filipino counterparts in the pursuit of their research and development activities.

This project started August 1, 1997 and will end on July 31, 2002.

II. THE JOINT COORDINATION COMMITTEE FOR THE IMPLEMENTATION OF THE PROJECT

1. Functions

The project is governed by a Joint Coordination Committee to oversee the effective and successful implementation of the project. Specifically, the Joint Coordination Committee is tasked to:

a. formulate the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation (TSI) to be formulated under the framework of the Record of Discussions (R/D);

b. review the overall progress of the technical cooperation project as well as the achievement of the above-mentioned Annual Work Plan; and

c. review and exchange views on major issues arising from or in connection with the project.

2. Composition

The Committee is chaired by the Secretary of the Department of Agriculture. Members include concerned officials of the Department of Agriculture, JICA, the National Economic and Development Authority (NEDA), the Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD), and UP Los Baños.

POSITION	NAME
Chairman	
Secretary, Department of Agriculture (DA)	Hon. Edgardo J. Angara
Vice Chairman	
Undersecretary for Operations and Research, DA	Hon. Cristino M. Collado
Members:	
1. Executive Director, PhilRice	Dr. Santiago R. Obien
2. Deputy Executive Director, PhilRice	Dr. Leocadio S. Sebastian
3. Deputy Executive Director, PhilRice	Mr. Ronilo A. Beronio
4. Long-term Experts, JICA	
- Team Leader	Dr. Hitoshi Takahashi
- Coordinator	Mr. Takanobu Nawashiro

- Plant Breeding	Mr. Takehiko Sasaki
- Farm Mechanization	Engr. Shuji Ishihara
- Agronomy	Mr. Shoji Furuya
5. Resident Representative of JICA, Philippine Office	Hon. Hideo Ono
6. Director, DA-Bureau of Agricultural Research	Dr. Eliseo R. Ponce
7. Chief, Project Coordination and Management Division, DA	Mr. Francisco A. Ramos III
8. Director, Agriculture Staff, National Economic and Development Authority (NEDA)	Mr. Felizardo K. Vertucio, Jr.
9. Director, Project Monitoring Staff, NEDA	Dir. Rolando G. Tungpalan
10. Executive Director, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)	Dr. Patricio S. Faylon
11. Dean, College of Agriculture University of the Philippines Los Baños	Dr. Luis Rey I. Velasco
12. Official(s) of the Embassy of Japan	Hon.Toru Okuda First Secretary (Agriculture)
13. Personnel concerned to be dispatched by JICA, if necessary	
JICA Short-term Experts	
- Farm Mechanization	Mr. Koji Inooku
- Soils and Fertilizers	Mr. Mizuhiko Nishida
- Food Science	Mr. Hiroshi Okadome
- Information Systems	Mr. Takayuki Aihara
Japanese Advisory Team	
- Leader	Dr. Akihiro Gondoh
- Member (Rice Varietal Improvement)	Dr. Masahiro Okamoto
- Member (Farm Mechanization),	Mr. Nobuyuki Sawamura
- Member (Agronomy)	Mr. Osamu Matsumura
- Member (Technical Cooperation)	Mr. Kenji Kaneko

3. Meeting

a. March 25, 1998: The first meeting was held to discuss the Tentative Schedule of Implementation (Itemized) and annual activity plan for FY1998 at DA-ITCAF Conference Room with the participation of the Japanese Consultation Team.

b. March 25, 1999: The second meeting was held to discuss the Tentative Schedule of Implementation (Itemized) and annual activity plan for FY1999 at PhilRice Central Experiment Station, Maligaya, Muñoz, Nueva Ecija.

c. March 27, 2000: The third meeting was held to discuss the mid-term activity plan for FY2000-2002 and mid-term evaluation on the progress of the project with the Japanese Advisory Team at PhilRice Central Experiment Station, Maligaya, Muñoz, Nueva Ecija.

III. PROGRESS REPORT OF THE TENTATIVE SCHEDULE OF IMPLEMENTATION (TSI)

III. PROGRESS REPORT OF T.S.I.

TENTATIVE SCHEDULE OF IMPLEMENTATION (TSI)[a]

Item/Activity	Year						Remarks for 1999
	1997	1998	1999	2000	2001	2002	
1. Development of high-yielding and better quality rice varieties which are suitable for mechanization							
(1) Development of high-yielding and better quality promising lines for mechanized farming in irrigated lowland							
(a) Development of high-yielding and better quality lines with less shattering and lodging resistance	XX	XXXX	XXXX	X			PJ18, with less shattering, high yield and good grain qualities, was selected and nominated for the 2000 DS NCT trial. Also, 24 less shattering lines were identified for further performance tests. Among the breeding lines evaluated, 116 with moderate to non-shattering resistance were selected. For lodging resistance, 52 and 44 lines were evaluated during the DS and WS, to search for better donor germplasm and to refine screening methodologies.
(b) Development of high-yielding and better quality lines for direct seeding cultivation		XXXX	XXXX	X			13 hybrid populations were generated by employing the backcross method to transfer anaerobic tolerance of donor germplasm to popular Philippine varieties such as IR64. Out of 88 breeding lines, 20 anaerobic-tolerant lines were selected in the mass screening.
(2) Development of cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas							
(a) Development of high-yielding lines with strong cool-temperature tolerance	XX	XXXX	XXXX	X			PJ9, PJ10, and PJ13 all had strong cold tolerance, resistance to blast, and better grain quality.
(b) Development of high-yielding lines with cool-temperature tolerance and good grain quality	XX	XXXX	XXXX	X			Promising lines with season and location suitability are continuously generated. 18 and 6 promising lines were identified for preliminary yield test in Banaue and BSU.

[a] _______ Master Plan XXX Implementation (as of March 2000) .... As needed

Item/Activity	Year 1997	1998	1999	2000	2001	2002	Remarks for 1999
							A cold tolerance screening facility was established to augment on-site breeding activities. Several tests had been conducted. Screening for blast resistance under blast nursery and field conditions was conducted in BSU.
(3) Evaluation of local adaptability of promising lines							
(a) Evaluation of promising lines in the NCT and other local adaptability tests	XX	XXXX	XXXX	X			For irrigated lowlands, five elite lines PJ3-5, PJ(T)4C, PJ7, PJ17, and PJ18 are in the NCT. PJ(G)6, a glutinous line, has completed NCT trials and is awaiting final deliberation. PJ-3 and PJ(T)4 were nominated to the International Network for Genetic Evaluation for Rice (INGER). For the cool elevated areas, PR26402-4B and PR26675-5B-31-4 were elevated to the NCT in the 1999 WS and 2000 DS, respectively. PJ2, a cold-tolerant line pre-released in farmers' fields, is now awaiting deliberation for possible release. Aside from the NCT, these elite lines were evaluated for local adaptability tests in Nueva Ecija in Luzon, Negros in the Visayas, and Agusan del Norte in Mindanao.
2. Development of farm machinery for small-scale rice farmers							
(1) Development of machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition							
(a) Development of land preparation equipment for direct-seeding		XX	XXXX	X			Existing models of the side-plow were assessed. The reversible side-plow was fabricated and tested.
(b) Improvement of performance of hand-tractor -mounted seeder	X	XXXX	X				Users' responses are being gathered.
(c) Development of direct-seeding equipment							The relevance of developing broadcast seeders was reviewed, and farmers' needs were assessed.

________ Master Plan XXX Implementation (as of March 2000) .... As needed

Item/Activity	Year 1997	1998	1999	2000	2001	2002	Remarks for 1999
(2) Development of rice harvesting machinery for small-scale farmers							
(a) Improvement of reaper models	X	XXXX	XXXX	X			Commercial models of the rotary reaper are being evaluated and improved.
(b) Development of crop gathering equipment		———	XXXX	X ———	———	———	Gathering devices to be attached to the reaper were fabricated and tested.
(c) Development of small combine harvester for rice		XX	XXXX	X ———	———	———	Self-propelled combine harvester is being fabricated. The power unit, carriage, threshing unit, and cutter table have been assembled.
3. Improvement of cultivation techniques for labor-saving and high-yielding rice production							
(1) Development of techniques for direct-seeding cultivation							
(a) Search for the ideal plant type for direct seeding		XXX	XXXX	X ———	———	———	Varieties and lines were selected in terms of germinability in anaerobic conditions, lodging, and yield performance.
(b) Improvement of land preparation for better crop establishment		XXX	XXXX	X ———	———	———	Seed pre-treatment and seeding time after land leveling for better seedling establishment were investigated. Weeds and weed control by herbicides and the employment of water management practices were investigated.
(c) Development of direct-seeding cultivation for increased yield		XXX	XXXX	X ———	———	———	Seeding methods and rates, and nitrogen management were investigated.
(2) Improvement of fertilizer application techniques for higher yielding and better quality rice							
(a) Improvement of nutrient-use efficiency		......	X	X	......	......	Growth parameters such as plant height, tiller number and SPAD values that estimate the plant's nitrogen status were established in the test variety, PSB Rc14. N^{15} labelled nitrogen fertilizer was used to determine efficiency of applied fertilizer at different growth stages (10 and 35 DAS, PI, flowering) in direct-seeded rice.

[a] ——— Master Plan XXX Implementation (as of March 2000) .... As needed

Item/Activity	Year 1997	1998	1999	2000	2001	2002	Remarks for 1999
(3) Improvement of techniques for disease and insect pest management							
(a) Synthesis and utilization of nationwide historical data on insect pest incidence in the development of location-specific insect pest profiles		X	.....	.....	.....	.....	Researchers and field workers were trained to monitor insect pest populations using the sticky board method, and its use was adapted in other areas.
(b) Development of standard techniques to determine the mechanisms of resistance of rice cultivars to rice blast disease		.....	.....	.....	.....	.....	Rice varieties resistant to blast were verified through a natural infection process and artificial inoculation.
4. Improvement of rice quality evaluation techniques							
(1) Improvement of techniques for rice grain quality evaluation							
(a) Highly efficient measurement of moisture and nutrient contents of rice grain by Near-Infrared Reflectance (NIR)		.....	X.....	.....	.....	.....	Wavelength combinations used in the NIR analyzer were verified to minimize standard errors of prediction. Major constitutents of 50 rice samples such as moisture, crude protein and apparent amylose were determined using both conventional methods and NIR measurements. Correlation between the two methods was established.
(b) Establishment of criteria for predicting processing qualities of rice		.....	.....	X.....	.....	.....	Physicochemical properties of several Philippine and Japanese rices were determined: moisture, amylose, and crude protein contents, fat acidity, pasting properties (RVA), and texture profile (tensipresser). The physicochemical properties and processing suitability of Philippine and Japanese glutinous rices for *arare* production were compared. Packaging options for rice noodles were studied. Insect pests and natural enemies of stored products such as rice were identified.

a

_______ Master Plan XXX Implementation (as of March 2000) .... As needed

Item/Activity	Year						Remarks for 1999
	1997	1998	1999	2000	2001	2002	
5. Development of mechanized rice-based farm management systems							
(1) Development of models of mechanized rice-based farm management							
(a) Development of farm management models for evaluating mechanized rice-based farming systems		...	...	...	...	...	Data on yield and socio-economics in the farm level were collected.
(b) Development of techniques for monitoring and evaluation of rice-based farming systems using Geographic Information System (GIS) technology		...	X...	...	...	...	Digitized maps of Maligaya, Muñoz, Nueva Ecija were prepared. A socioeconomic database of rice farming in Maligaya (field level) and Nueva Ecija was developed. A crop suitability analysis and ex-ante impact evaluation methodology was formulated.
(2) Development of an information system for rice and rice-based farming technologies							
(a) Development of farm database foe better transfer of rice technology information		...	...	X...	...	...	Information on rice technologies is ready for conversion to HTML. The information structure (installation of 600 m fiber optic cable, cabling of buildings, linking up the branch stations, etc) was started. Information for uploading in the PhilRice website and databases was organized.

a ______ Master Plan XXX Implementation (as of March 2000) .... As needed

IV. MID-TERM REVIEW OF THE TECHNICAL COOPERATION

IV. MID-TERM REVIEW OF THE TECHNICAL COOPERATION

1. Dispatch of Japanese Experts

Field/Expert	Year					
	1997	1998	1999	2000	2001	2002
1. Long-term Experts						
(1) Team Leader (Dr. Hitoshi Takahashi)	XXX	XXXXXX	XXXXXX	X		
(2) Coordinator (Mr. Takanobu Nawashiro)	XXX	XXXXXX	XXXXXX	X		
(3) Varietal Improvement (Mr. Takehiko Sasaki)	XXX	XXXXXX	XXXXXX	X		
(4) Farm Mechanization (Engr. Shuji Ishihara)	XX	XXXXXX	XXXXXX	X		
(5) Agronomy (Mr. Shoji Furuya)		XXXX	XXXXXX	X		
2. Short-term Expert(s) in the field of:						
(1) Farm Mechanization (Reaper) (Engr. Kunihiko Maeoka)	X					
(Engr. Koji Inooku)			X	X		
(2) Farm Mechanization (Paddy Seeder) (Dr. Ryuji Otani)		X				
(3) Agronomy (Mr. Shoji Furuya)		X				
(4) Weed Science (Mr. Yoshiaki Kawana)				X		
(5) Soil Chemistry (Dr. Shigeru Takahashi)			X			
(Mr. Mizuhiko Nishida)				X		
(6) Entomology (Mr. Shingo Oya)		X				
(7) Food Science (Dr. Tetsuo Sato)			X			
(Mr. Hiroshi Okadome)				X		
(8) Farm Management (Mr. Jinzo Saito)			X			
(9) Information Systems (Mr. Tarayuki Aihara)				X		

2. Training of Philippine Personnel in Japan

Field	Name/Position	Training Period	Affiliation/Destination
FY 1997			
1) Farm Mechanization	Engr. Rizaldo E. ALDAS (Sr. Sci. Res. Specialist)	1998.02.29 - 1998.10.23	Tsukuba International Agricultural Training Center
2) Agricultural Ext. Service	Engr. Leo C. JAVIER (Chief Sci. Res. Specialist)	1998.03.16 - 1998.04.25	Ministry for Agriculture, Fisheries & Food (MAFF), National Agriculture Research Center (NARC)

Field	Name/Position	Training Period	Affiliation/Destination
3) Food Processing	Ms. Juma Novie B. AYAP (Sr. Sci. Res. Specialist)	1998.03.31 - 1998.11.22	National Food Res. Institute (NFRI), Tsukuba & Niigita
4) Information Processing	Ms. Teodora L. BRIONES (Dev. Mgt. Officer III)	1998.03.31 - 1998.05.31	NARC
FY 1998			
5) Agricultural Extension	Mr. Paterno I. REBUELTA (Sr. Science Res. Specialist)	1998.05.05 - 1998.07.10	Tokyo International Center (TIC)
6) Agronomy	Ms. Evelyn F. JAVIER (Science Research Specialist)	1998.05.12 - 1998.11.14	NARC
7) Biotechnology	Ms. Victoria C. LAPITAN (Science Research Specialist)	1998.06.15 - 1998.12.22	National Institute of Agrobiological Resources (NIAR)
8) Entomology	Dr. Alejandra B. ESTOY (Sr. Science Res. Specialist)	1998.08.17 - 1998.09.29	Kyushu National Agricultural Experiment Station
9) Plant Breeding	Mr. Hilario C. DELA CRUZ (Chief Science Res. Specialist)	1998.08.17 - 1998.10.31	Tohoku National Agricultural Experiment Station and NARC
10) Food Science	Ms. Marissa V. ROMERO (Sr. Science Res. Specialist)	1998.03.30 - 1998.09.11	NFRI
FY 1999			
11) Farm Management	Ms. Alice M. BRIONES (Sr. Science Res. Specialist)	1999.05.23 - 1999.10.29	NARC
12) Plant Physiology in Rice	Dr. Rolando T. CRUZ (Chief Science Res. Specialist)	1999.06.07 - 1999.08.13	NARC, Tohoku and Kyushu National Agricultural Experiment Stations
13) Administration of the Institute	Dr. Leocadio S. SEBASTIAN (Deputy Diretor for R&D)	1999.08.23 – 1999.09.10	MAFF, NARC and others
14) Farm Mechanization	Engr. Elmer G. BAUTISTA (Science Res. Specialist)	2000.03.20 – 2000.06.25	Tsukuba International Center, and Bio-oriental Research Advancement Institution, Omiya City

3. Provision of Machinery and Equipment (in million Pesos)

	FY 1997	FY 1998	FY 1999	TOTAL
Purchased in the Philippines	1.781	4.895	23.576	30.252
Shipped from Japan	19.900	8.783	6.063	34.746
Brought by Experts	0.707	1.249	0.661	2.617
TOTAL	22.388	14.927	30.300	67.615

4. Achievements of the TSI

4-1. Varietal Improvement

4-1-1. High-yielding and better quality rice varieties for mechanized farming in irrigated lowlands

a. PJ18, a new high-yielding line with less shattering and better quality

PJ18 was selected from the single cross Suweon 325 / BPI Ri10. It matures in 120 days and grows to an average height of 95 cm. It has excellent eating quality, better than IR64, the most popular Philippine variety. It resembles its female parent Suweon 325 for its moderate shattering habit while from BPI Ri10, for its good eating quality. It also showed moderate field reactions to bacterial leaf blight, an emerging major disease in the lowlands. Table 1 shows the performance of PJ18 in the AON and PYT.

Table 1. Yield performance and other agronomic traits of PJ18 in the AON and PYT, 1999.

Nursery/ Yr/Season	Selection	MAT DAS [1]	HT cm	TL no.	Stresses [2]	Shatt [3]	Yield t/ha	KQ [4]	%MR [5]	%HR [6]	SE [7]	Remarks
AON/	PJ18	120	82	18	-	S-MS	5.5	O	69.5 (G1)	55.4 (G1)	O	PYT
99DS	IR64 (check)	112	79	18	-	S	6.3	[ ]	67.6 (G1)	39.8 (G2)	O	
	IR72 (check)	115	79	21	blb	S	5.2	[ ]	70.1 (Pr)	32.4 (G3)	Λ	
PYT/												
99WS	PJ18	121	107	15	-	MS	3.4	O	62.4 (G2)	38.4 (G3)	OO	GYT/NCT
	IR64 (check)	119	119	18	Shb,shr,cls	S	3.3	[ ]	63.2 (G2)	32.8 (G3)	O	
	IR72 (check)	118	103	15	SHB	S	3.0	[ ]	64.8 (G2)	25.6(G4)	Λ	

[1] MAT= maturity DAS=days after sowing , HT=plant height , TL no. =tiller number

[2] BLB (blb)=bacterial leaf blight, ShB (shb)=sheath blight, ShR (shr)=sheath rot, CLS (cls)=*Cercospora* leaf spot

Capital letters mean severe infection; small letters mean moderate

[3] Shatt= shattering: S =shattering, MS=moderately shattering

[4] KQ=kernel quality: O =good, [ ] =fair

[5] % MR= % milling recovery: G2=60.1%-65.0%, G1= 65.1%-70.0%, Pr= 70.1 and above

[6] % HR= % head rice: G1=48.0%-56.9%, G2= 39.0 - 47.9%, G3=30.0%-38.9%

[7] SE= sensory evaluation: OO=better than IR64, O= comparable to IR64, Λ=poorer than IR64

b. **Mass screening methods initiated for anaerobic tolerance and lodging resistance required in varieties for direct seeding**

Three cultivars - ASD1, Arroz de Terra, and Italica Livorno - were repeatedly evaluated under anaerobic conditions. They showed consistent tolerant reactions, hence were used as check cultivars in the mass screening of 88 breeding lines from which 20 promising lines were selected.

For lodging resistance, visual and mechanical evaluations were continued to identify donor germplasm. Initial results indicated wide variations among test entries. Very common type is the break-type lodging but equally important is the root lodging resistance. Varietal introductions such as Lemont, M401, and Kanto PI11 were already used to improve root lodging resistance of Philippine varieties.

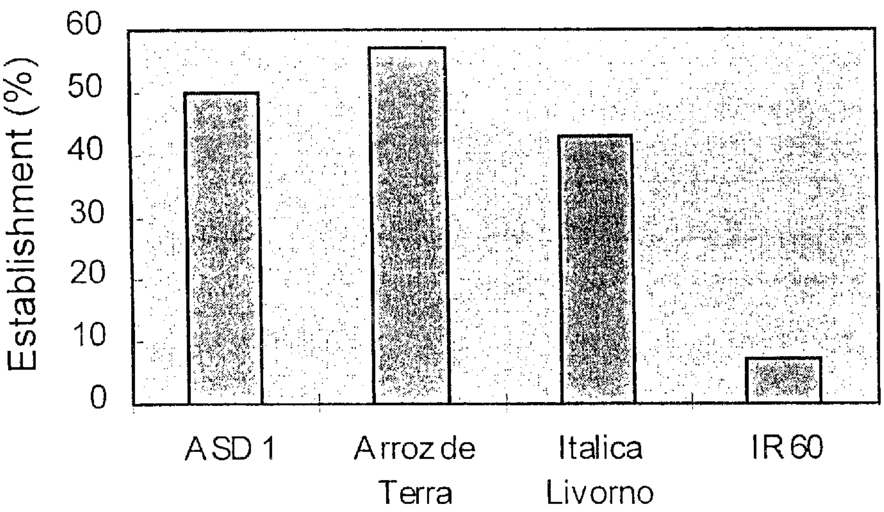


Figure 1. Establishment of check varieties in an anaerobic tolerance screening test, PhilRice Maligaya, 1999 WS.

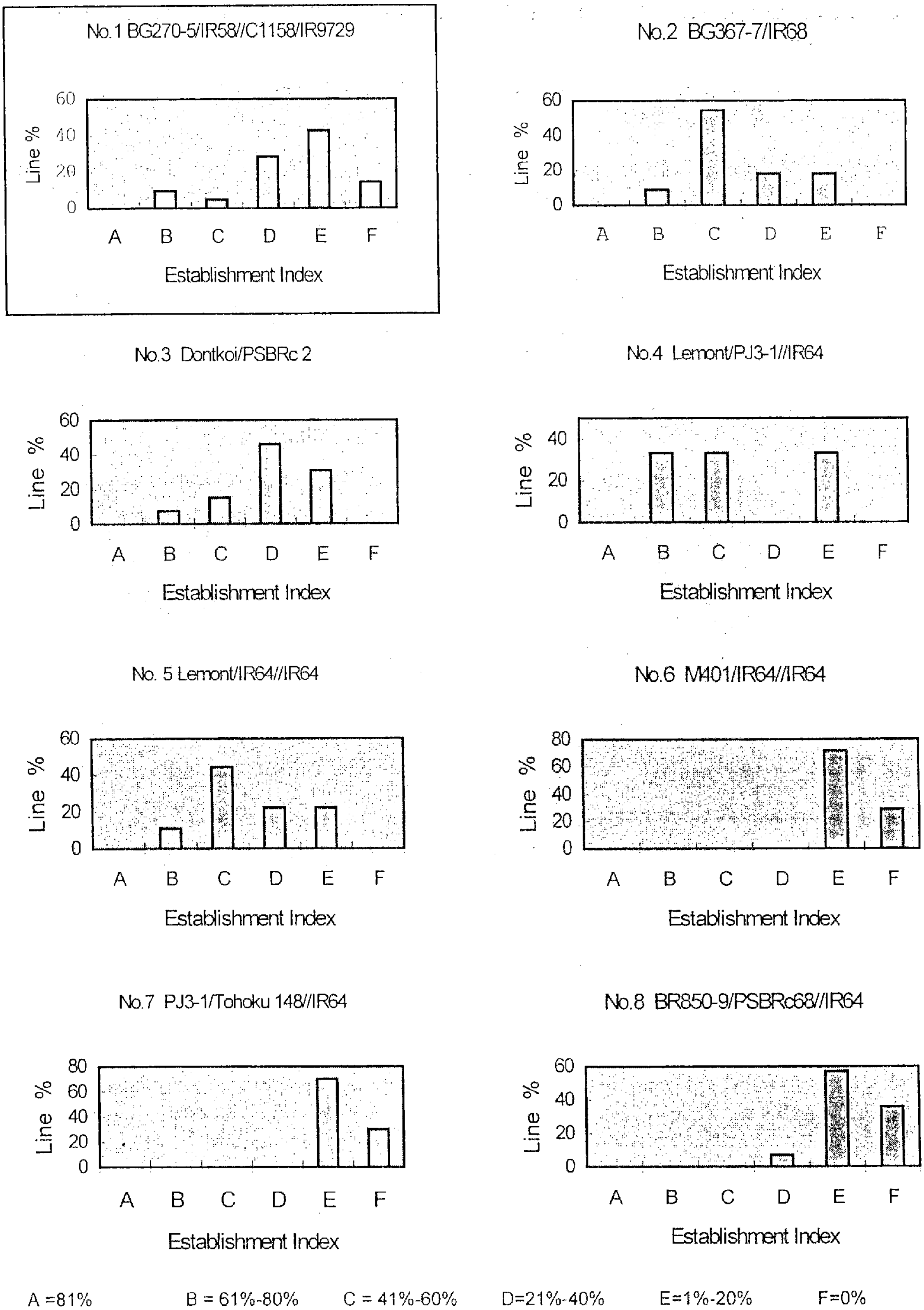


Fig. 2. Frequency of lines based on establishment index in an anaerobic tolerance screening test, PhilRice Maligaya, 1999 WS.

44-1-2. Cool temperature-tolerant and high-yielding promising lines with good grain quality

a. Three highly cold-tolerant lines - PJ9, PJ10 and PJ13 - for cool elevated areas

Eight promising lines, PJ9 to PJ16, were initially identified. Repeated evaluation across DS and WS confirmed the strong cold tolerance, stable field resistance to blast and good quality of PJ9, PJ10 and PJ13.

PJ9 and PJ10 were progenies of the cross Chiyonishiki/Reiko 2. PJ9 matures in about 145 days while PJ10 in 133 days. Both are non-shattering. PJ13, on the other hand, was selected from Tohoku 143/Gokei 2. It has very good kernel quality and showed resistance to viviparity. Under natural blast infection, these elite lines showed susceptible reactions in the blast nursery during the seedling stage but in the field condition, they tolerated severe infection. However, yielding ability of these lines should be improved.

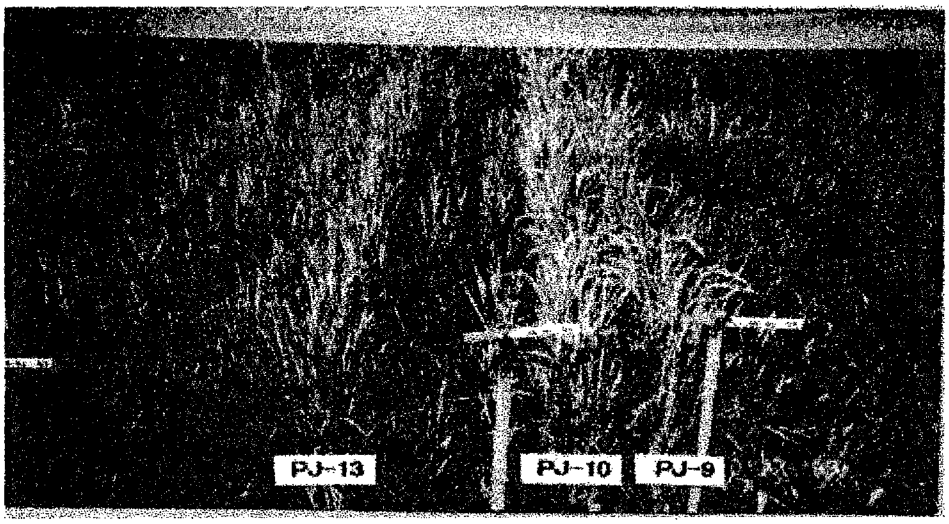


Photo 1. Performance of promising PJ lines with cold tolerance and blast resistance in the Observational Nursery, BSU, La Trinidad, Benguet, 1999 WS.

b. Location and season specificity as basis to implement breeding targets

Promising lines with season and location specificity were continuously generated. In the DS, a total of 276 lines were identified in Banaue, Ifugao while in La Trinidad, Benguet, 420 lines were selected. During the WS, only 74 lines were selected.

A cold tolerance facility was established in PhilRice Maligaya to augment on-site breeding activities. Initial trial was done on 41 traditional and 45 breeding lines/varieties by exposure to 18.7°C to 19.0°C cold water treatment from booting to heading stage. This test investigated proper water temperature to estimate varietal difference of cold tolerance and identified standard varieties. Ultimately, a mass screening method will be developed to help select cold-tolerant varieties.

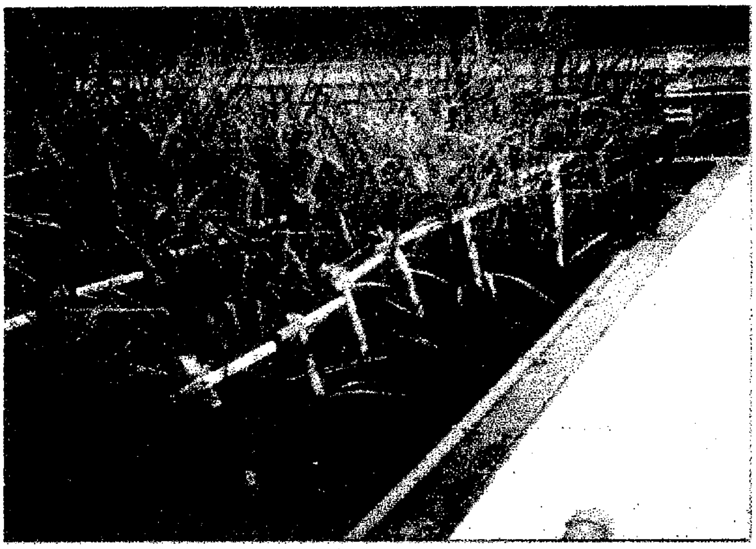


Photo 2. Screening of breeding materials in the cold tolerance screening facility, PhilRice Maligaya, 1999 WS.

4-1-3. Evaluation of local adaptability of promising lines

a. Adaptability tests intensified for PJ elite lines

For the irrigated lowland ecosystem, five elite lines PJ3-5, PJ(T)-4, PJ-7, PJ-17 and PJ-18 are in the National Cooperative Tests. PJ(G)-6, a glutinous selection, has completed NCT tests and is awaiting final deliberation. PJ3-1 and PJ(T)4 were nominated to the International Network for Genetic Evaluation for Rice.

For the cool elevated areas, PJ2, a cold-tolerant line, has been included in the variety promotion project in the Cordillera this 2000 DS. It is now currently promoted in 14 sites in the Cordillera and 2 locations in Cagayan de Oro City (Mindanao).

Local adaptability tests of these elite lines are also being conducted in Ilocos Norte and Nueva Ecija in Luzon, Negros in the Visayas and Agusan del Norte in Mindanao.

Table 2. Performance of the PJ lines in the NCT, 1999.

Entry	Yield (t/ha)		MAT (DAS)	HT (cm)	Tiller No.	BLB	B	RTV	BPH	%Amylose
	DS	WS								
a. Irrigated lowland (25 sites)										
PJ3-5	5.3	3.4	114	92	14	I	R	S	I	18.8 (L)
PJ(T)4*	-	2.8	123	108	13	-	-	-	-	-
PJ7	5.3	3.5	112	90	18	R	S	S	I	20.9 (I)
PJ17	5.1	3.5	112	90	15	I	R	S	S	19.2 (L)
IR72	5.8	3.8	113	87	16	I	S	I	I	23.2 (I)
PSB Rc30	4.8	3.4	112	87	16	I	I	S	I	19.3 (L)
b. Special purpose (2 sites)										
PJ(G) 6	6.3	3.1	120	115	13	R	I	S	S-MS	6 (VL)
IR65	6.3	2.0	117	100	16	I	I	S	MS	6 (VL)
c. Cool elevated (3 sites)**										
PJ2	4.7	-	155	93	18	I	I	S	I	17.7 (L)
PSB Rc44 (Gohang)	3.6	-	160	90	15	S	S	S	MR	23.4 (I)

* new entry, 1999 WS, data for pests and grain quality are being processed

** Dry season evaluation

MAT (DAS)= maturity (days after sowing)

HT= plant height

BLB = bacterial leaf blight — B = blast

RTV = rice tungro virus, modified field screening — BPH = brown plant hopper

R = resistant — I = intermediate

MS = moderately susceptible — S = susceptible

% Amylose content: Very Low (VL)= 2.1%-10.0%, Low (L)=10.1%-20.0%, Intermediate(I)=20.1%-25.0%

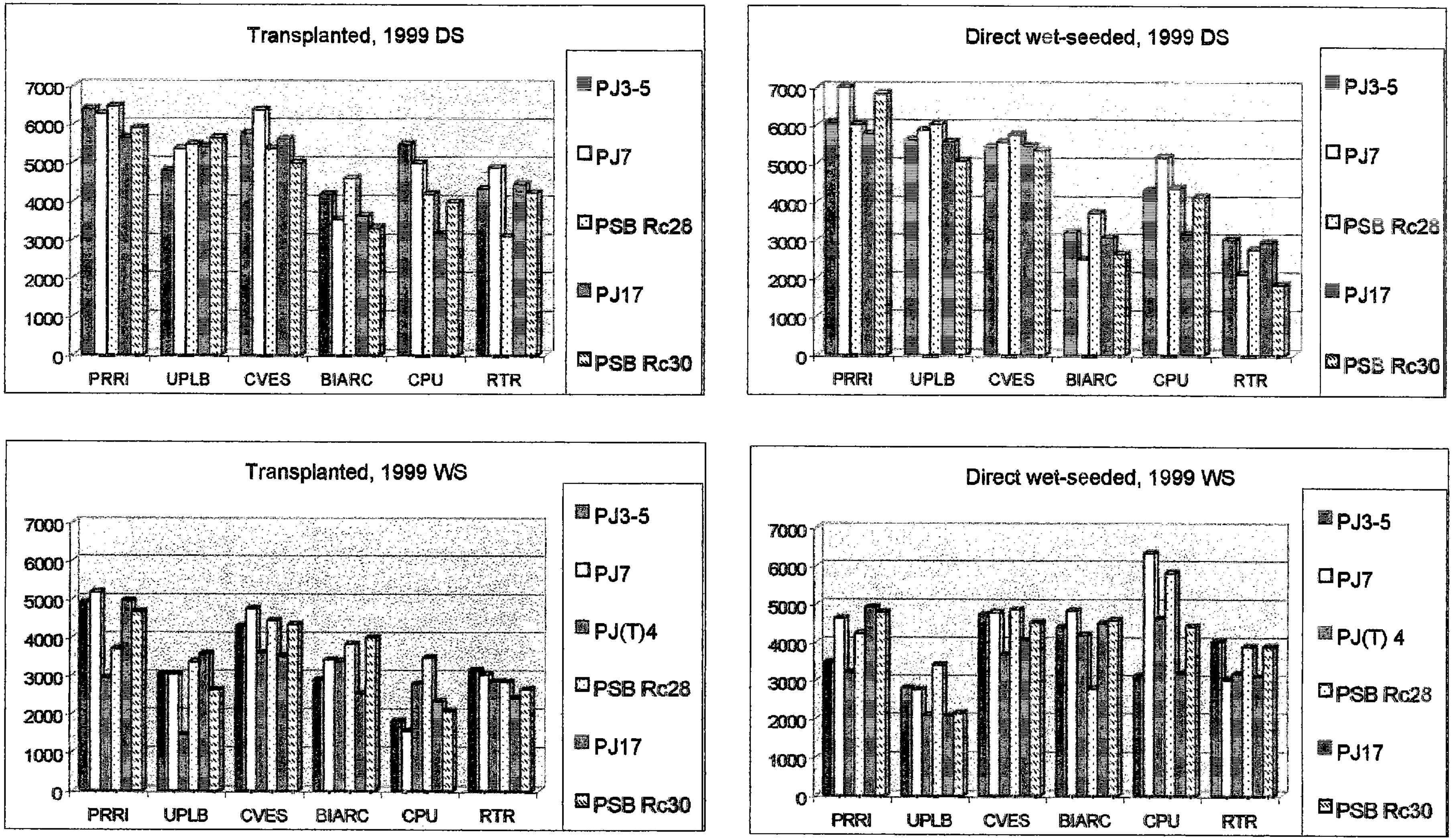


Figure 3. Yield performance of the promising PJ lines by crop establishment across locations and seasons in the NCT Irrigated Lowland Phase I, 1999.

4-2. Farm Mechanization

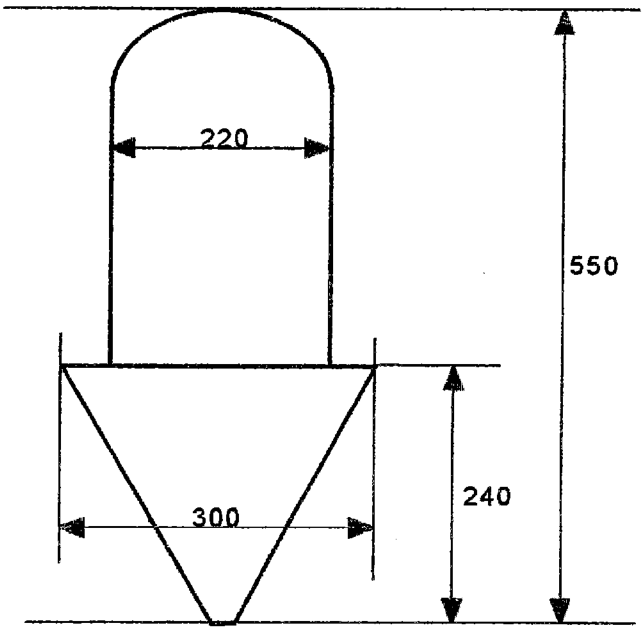
4-2-1. Machinery for plowing, leveling, and seeding for direct seeding cultivation

4-2-1-1. Development of land preparation equipment for direct seeding

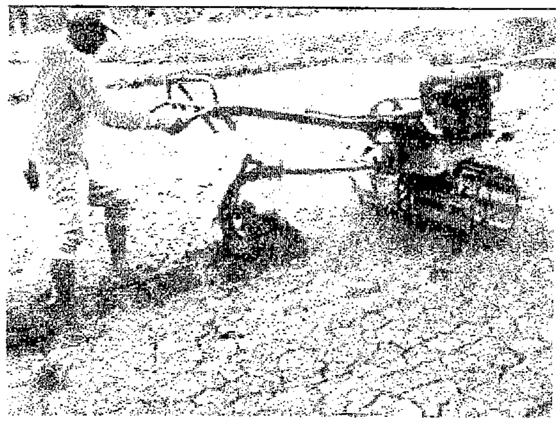
Plow and linkage for plowing the untilled portion of land adjacent to levees

A device has been developed for plowing the portion of land alongside levees that the conventional power tillers leave untilled, requiring additional carabao operation. The experimental unit incorporated a reversible type of Japanese plow with flat-curved mold board. The reversible plow can easily switch the direction of turning soil to either right or left, enabling operators to proceed either clockwise or counter-clockwise without changing the direction of soil turn. Adjustable parallel linkage bars make it possible to position the plow body behind the left or right cage wheel of the tractor.

Farmers now can complete the land preparation task without resorting to animal power.



Dimensions of plow share-moldboard



Plow in operation

4-2-1-2. Improvement of performance of the tractor-mounted seeder

Monitoring farmers' responses

Twelve units of the hand tractor-mounted drum seeder (HTMDS) were distributed among cooperating farmers and their responses were evaluated. They varied depending on socio-economic as well as agronomic conditions of the farms.

(1) Farmers were unanimous about the effects of saving seeds by using the HTMDS. Amount of seeds has been reduced to less than 50 % of that consumed by manual broadcasting. Farmers also found the row-seeded crop more conducive to subsequent crop management practices. Particularly, seed growers appreciated these features.

(2) Farmers identified the need for more elaborate land preparation work for efficiently operating the HTMDS. The fields should be plowed and submerged for at least two weeks in advance to accelerate the disintegration of debris and stubbles of the preceding crop.

(3) Where ample labor is available, farmers preferred to hire many laborers for manual broadcasting rather than utilize the HTMDS for longer operation by fewer individuals.

(4) One seed grower establishes his crop of 5 ha entirely by the HTMDS for consecutive seasons, regardless of wet or dry. The east-west row seeding always gives significantly higher yields than north-south rows.

(5) The installation of another row of holes between the existing two rows on each seed drum improved the uniformity of seed distribution, resulting in better crop growth and yield.

(6) Slower operating speed allowed the operator better control of the machine, enabling him to get straight rows and permitting easier detection of possible malfunctions.

(7) It is imperative to implement an aggressive campaign of in-field guidance and technical support to extend this technology to a wider public (see next program).

4-2-1-3. Development of direct seeding equipment

Broadcast seeder mounted on hand tractor

The viability of the project was discussed considering the rationales and past experiences with mechanical seeders in general. No substantial agronomic advantages could be identified over the row-seeded or manually broadcast crop. Uniform planting density and labor saving which can be realized by mechanical operation can not justify this technology. With the use of walking type tractors in puddled rice fields, the anticipated capacity for labor-saving effects is limited because of the slow travel speed (3 km/h or less) and limited width of dispersion (10m at most). Hence, the project was suspended.

Questionnaire survey of farmers' intention for mechanizing seeding operations

Parameters	Values
Areas surveyed	Talavera, Nueva Ecija; San Miguel and Baliuag, Bulacan; Camiling and Mayantoc, Tarlac; Aurora, Isabela and Solana, Cagayan (All irrigated lowland except for Solana, which is rainfed lowland)
Age of respondents	38-69 years old
Land holding	60% (average of 2.7 ha) 30% (average of 1.7 ha) 10% (average of 4.5 ha)
Preferred crop establishment method	
Wet season	Transplanting (100 %)
Dry season	Transplanting (40 %); Direct seeding (60%)
Problems cited	
Transplanting	Labor cost and shortages; ₱1,500-2,000/ha
Direct seeding	Golden snails, birds, rats, weeds and control of water
Amount of seeds	
Transplanting	150 kg/ha (average)
Direct seeding	200 kg/ha to 300 kg/ha
Herbicides used	Machete, Sofit, Nominee, Advance
Varieties planted	IR64, PSB Rc14, PSB Rc28, PSB Rc32, PSB Rc52, PSB Rc54
Need for mechanical seeder	75% wishes to mechanize by row seeder (preferred for easier identification of weeds and easier application of fertilizer) 25% has no intention to mechanize (contented with hand broadcasting and fearing additional cost for machine.
Spacing preferences	20 cm (majority), 15 cm and 25 cm (few)
Capacity preferences	Small capacity (1 ha/day): 30% (field is small) >1 ha/day: 70% (big field and for custom hire). 60 kg/ha: 80 %
Seeding rate preferences	40 kg/h (10 %); 80 kg /ha (10%)

4-2-2. Rice harvesting machinery for small scale farmers

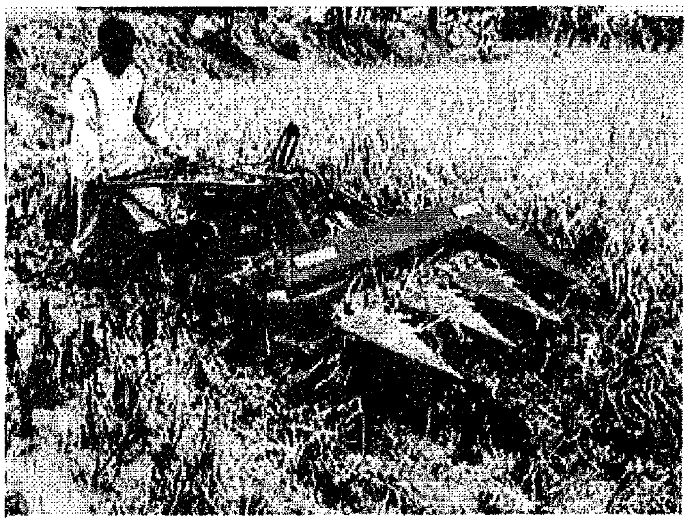
4-2-2-1. Improvement of reaper models

The design of the rotary reaper was refined further after identifying its weak points through a series of farmers' field tests. Two models (1.0 and 1.1) were released commercially to two cooperating manufacturers for mass fabrication.

One manufacturer has fabricated and sold to farmers several units of the 1.1 model. An operator's manual was compiled and published.

Field test results

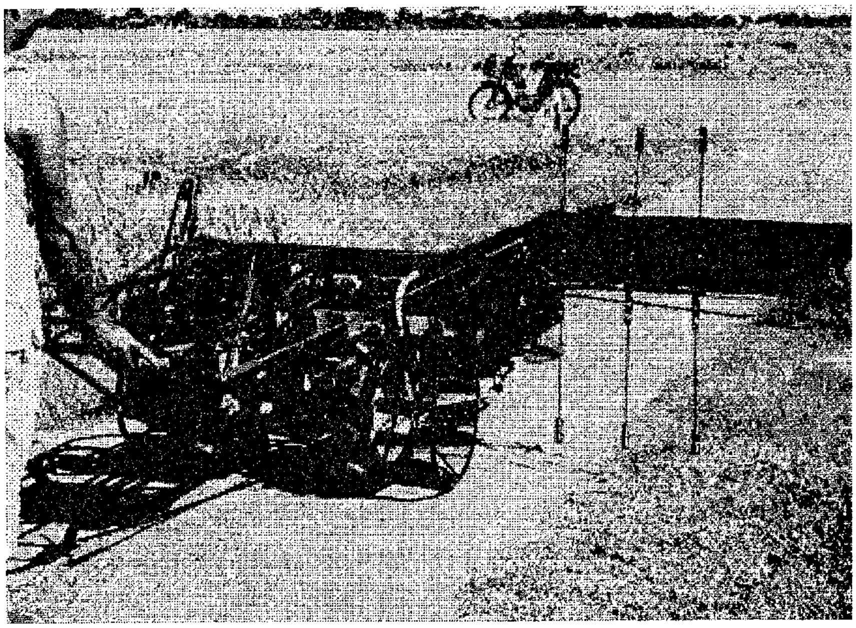
Variables	Observed values
Date	July 30, 1999
Farmer's name and location	Dominador Batoon; Solano, Nueva Vizcaya
Plot area and soil condition	1396 sq. m Relatively dry
Variety	Burdagol (PSB Rc34)
Plant height	85-104 cm
Grain yield (estimate)	5390 kg/ha
Harvest index	20.2 % (grain weight basis)
Performance data	
Cutting height	22 cm
Total harvest time	1h13m2.66s (73.04min)
Time spent in headland turning	16.25 min
Time spent in harvesting only	46.39 min
Fuel consumption during test	1.7 L
Angle of cut	approximately 90-100 degrees
Shattering losses at cutting zone	0-7 (2.9) grains
Shattering losses at windrow zone	9-25 (15.4) grains
Field capacity	0.11 ha/h (8.7 h/ha)
Field efficiency	63.5%
Shattering losses (%)	0.7 (cutting zone); 1.3 (windrow zone)



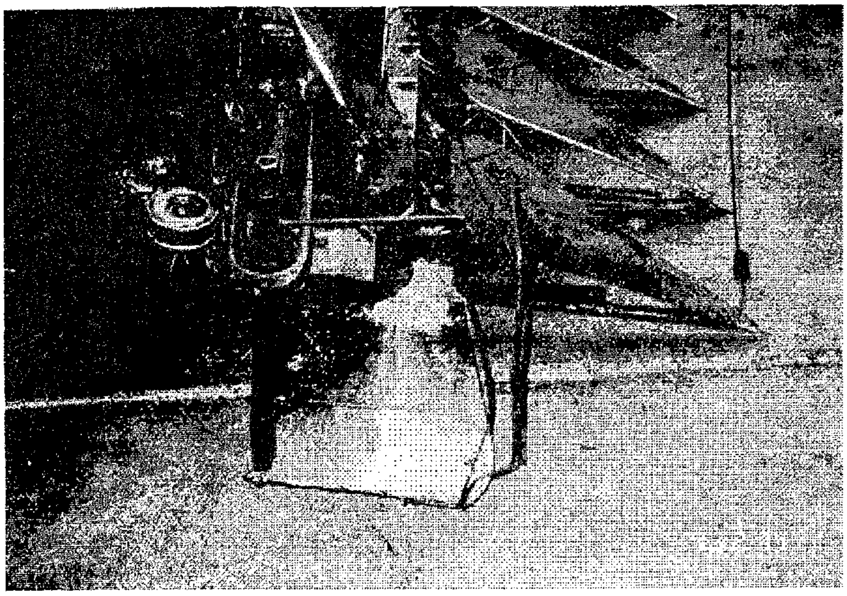
1.1 model of the rotary reaper in field demonstration

4-2-2-2. Development of crop gathering equipment

Two prototypes (vertical and rake gatherers) were designed and fabricated. Field test results showed some advantage of the rake type gatherer because it is simpler in design and showed more potential. Further modifications are currently being made on its design.



Experimental rake type unit



Experimental vertical type unit

4-2-2-3. Development of the small combine harvester for rice

A self-propelled prototype of the rice combine for small farms is being fabricated and is around 75% complete. The prototype employs a rotary type cutting component similar to that used in the rotary reaper (Table 1). With an effective cutting width of 1.8 m, it is expected to harvest an average of 2 hectares/day. The prototype is targeted to be ready for testing in April or May 2000.

Field tests of the existing imported rice combine (CLAAS) from Germany were conducted to gather benchmark data on its performance under Philippine conditions. Data on field capacity field efficiency, quality of grain output, and grain losses gathered will be used as guide in evaluating its performance of the prototype rice combine.

Specifications of the experimental unit

COMPONENT/PARAMETER	SPECIFICATION
Cutterbar	1.8 m cutting width with 5-section reel
Threshing system	Locally manufactured axial flow thresher with 525 mm diameter x 1200 mm long threshing drum equipped with spike teeth bars; with air and reciprocating screen cleaning components
Engine	4-cylinder Toyota Diesel engine (4DR5); water-cooled
Traction device	Four (4) individually driven pneumatic car tires with intermediate chain and sprocket transmission from propeller to differentials
Steering control	Power steering
Cutting device	Five (5) rotary cutters with an effective cutting width of 1.8m.
Straw conveying components	Auger to receive harvested materials from rotary cutters and feed them to the chain conveyor, and transport materials from the auger and feed them to the thresher. Threshing drum discharges the straw to the rear.
Estimated weight	2,000 kg
Dimension (L x W x H)	5m x 1.8 m x 2.8 m
Design field capacity	0.25 ha/h

4-3. Agronomy and Weed Management

4-3-1. Techniques for direct seeding cultivation

4-3-1-1. Seedling establishment

a. Seed pre-treatment

Regardless of soaking and incubation durations, seedling emergence is higher at saturated soil conditions than in the higher water level (2-3 cm). Under flooded condition, however, soaking the seeds for 1 day and incubating them for 1-2 days give higher seedling emergence than no soaking or incubation at all.

Among the varieties tested, PSB Rc34 can germinate well even in soils flooded from soaking to 15 days after sowing.

Table 1. Seedling emergence of selected PSB rice varieties under controlled conditions (pot experiment), PhilRice Maligaya, 1999 WS.

Duration (days)		Seedling emergence (%)						Mean
Soaking	Incubation	Rc18	Rc22	Rc34	Rc54	Rc64	Rc74	
2-3 cm floodwater								
1	2	36.3	22.5	42.5	10.0	21.3	26.4	26.5
1	1	27.7	17.5	38.8	8.8	25.0	25.0	23.0
1	0	8.8	5.0	23.8	1.2	6.2	0.0	7.5
0	0	2.5	0.0	18.8	0.0	1.2	0.0	3.8
Saturated condition								
1	2	51.7	32.5	76.7				53.6
1	1	59.2	30.8	56.7				48.9
1	0	35.0	18.3	45.8				33.0
0	0	5.0	7.5	28.3				13.6

b. **Seeding time after land leveling**

In the wet season, emergence rate of seeds is higher when seeded 1-3 days later after land leveling rather than on the same day. In the dry season, the rate is higher when seeded on the same day with land leveling.

Table 2. Seedling emergence rate and plant density/m^2 of PSB Rc34 and IR64 at four sowing times after final land leveling and two sowing methods, PhilRice Maligaya,1998 WS.

Treatment *	Plant density/m^2		Seedling emergence rate **	
	IR64	PSB Rc34	IR64	PSB Rc34
Broadcast-seeded				
0 DALL	229	143	69	45
1 DALL	296	279	89	88
2 DALL	297	336	89	106
3 DALL	320	318	96	101
Drum-seeded				
0 DALL	225	278	68	88
1 DALL	311	345	93	109
2 DALL	336	343	101	109
3 DALL	322	409	97	129

DALL=days after land leveling
* drained just before seeding
** calculated from seeding rate

Table 3. Effect of seeding time after land leveling on seedling emergence of PSB Rc14, PhilRice Maligaya,1998 DS.

Seeding methods	Seeding time * (DALL)	Land preparation	
		Conventional	Modified
Broadcast seeding	0	329 a	386 a
	1	250 b	360 a
	2	235 b	252 b
Drum seeding	0	281 a	274 a
	1	189 b	211 b
	2	93 c	170 c

Means in column with similar letters are not significantly different from each other at 5% level of significance.

c. Water management after seeding

Seedling emergence is higher when seeds are sown on saturated soil and even up to 3 days submerged condition. PSB Rc74 showed higher grain yield than PSB Rc52 and IR62141-114-2-2-2-3.

Table 4. Grain yield and seedling emergence of rice varieties and breeding line as affected by water management schemes after sowing, PhilRice Maligaya, 1999 WS.

Treatment	PSB Rc52	PSB Rc74	IR62141-114-2-2-2-3	Mean
Grain yield (t/ha)				
Drained before sowing	4.6 ab	6.2 a	4.6 a	5.1 a
Drained 1 DAS *	5.3 a	5.3 a	3.6 ab	4.7 ab
Drained 3 DAS *	4.1 b	5.2 a	3.5 b	4.2 b
Drained 6 DAS *	4.4 ab	5.2 a	3.5 b	4.4 b
Seedling emergence (%)				
Drained before sowing	88	80	97	88
Drained 1 DAS *	92	83	95	92
Drained 3 DAS *	73	47	100	73
Drained 6 DAS *	30	31	75	45

* Seeds sown in the soil with standing water of 2-3 cm
Means in column with similar letters are not significantly different from each other at 5% level of significance.

4-3-1-2. Seeding methods

Yields did not significantly differ among seeding rates and methods. Lodging resistance, however, was higher in drum-seeded rice and in lower seeding rate. Therefore, the seeding rates of 40-50 kg/ha in DS, and 50-60 kg/ha in WS are recommended for higher resistance and cost efficiency.

Table 5. Effects of seeding rates on grain yield, PhilRice Maligaya, 1999 DS.

Seeding rates (kg/ha)	Nitrogen rates (kg/ha)			Seeding rate mean
	0	90	120	
40	2.79 a	4.98 a	5.32 a	4.36 b
80	2.81 a	5.23 a	5.25 a	4.43 ab
160	2.97 a	5.40 a	5.66 a	4.68 a

Means in column with similar letters are not significantly different from each other at 5% level of significance

Table 6. Effects of seeding, nitrogen rates and establishment methods on grain yield, PhilRice Maligaya, 1999 WS.

Seeding rates (kg/ha)	Nitrogen rates (kg/ha)			N means	Seeding method mean
	0	60	90		
Drum-seeded					
40	3.60	4.20	4.12	3.97	
60	3.17	3.89	4.10	3.72	
80	2.73	4.13	4.08	3.65	3.78
Broadcast-seeded					
40	3.63	4.16	3.86	3.88	
60	3.18	4.15	4.01	3.78	
80	3.19	4.01	4.38	3.86	
Seeding rate mean	3.25	4.09	4.09		3.84

4-3-1-3. Nitrogen management

In the dry season, a nitrogen rate of 120 kg/ha applied at 4 splits (60 kg at 10 DAS, 20 kg at 25 DAS, 20 kg at 20 DBH, and 20 kg at 10 DBH) is expected to increase yield as compared to the same rate of N but applied twice (80 kg at 10 DAS and 40 kg at 40 DAS). In the wet season, appropriate nitrogen rate is considered to be 90 kg at 2 or 4 splits, and 120 kg at 4 splits for varieties susceptible to lodging and resistant varieties, respectively. As to the relationship of the leaf color value (LCV) and lodging of direct-seeded rice, lodging will likely occur when the LCV is greater than 36 at 34 DAS and 33 at 46 to 62 DAS.

Table 7. Effect of nitrogen management on the ripening, bending resistance and yield of PSB Rc14, PhilRice Maligaya, 1999 DS.

N rates (kg/ha)	Mode of application (10DAS-25DAS-40DAS-20DBH-10DBH)	Ripening percentage	Bending resistance	Yield (t/ha)
0	0	78.6 a	0.665	2.45 b
90	60-00-30-00-00	67.6 bc	1.129	5.21 a
90	60-00-00-15-15	68.2 bc	1.156	4.80 a
90	45-15-00-15-15	64.0 bc	1.209	5.06 a
90	45-00-15-15-5	70.4 b	1.230	4.85 a
120	80-00-40-00-00	66.9 bc	1.306	4.89 a
120	60-20-00-20-20	63.0 c	1.210	5.39 a
120	60-00-20-20-20	55.3 d	1.277	5.16 a

Means in column with similar letters are not significantly different from each other at 5% level of significance

Table 8. Effect of nitrogen management on lodging resistance and yields of direct-seeded rice, PhilRice Maligaya, 1999WS.

Nrates (kg/ha)	Mode of application (10DAS-25DAS-35DAS-20DBH-10DBH)	Lodging resistance				Yield (t/ha)			
		PSB Rc52	PSB Rc74	IR 62141-114-2-2-2	Mean	PSB Rc52	PSB Rc74	IR 62141-114-2-2-2	Mean
90	60-00-30-00-00	1.24 a	1.69 a	1.32 ab	1.42	4.41	4.95	4.89	4.75
90	45-15-00-15-15	1.40 a	1.83 a	0.91 bc	1.38	4.57	4.83	4.18	4.52
120	80-00-40-00-00	1.22 a	1.75 a	1.41 a	1.46	3.97	4.79	4.90	4.55
120	60-20-00-20-20	1.45 a	1.74 a	0.64 c	1.28	3.77	5.35	4.32	4.48
Mean		1.33	1.75	1.07		4.18 b	4.98 a	4.57ab	

Means in column with similar letters are not significantly different from each other at 5% level of significance

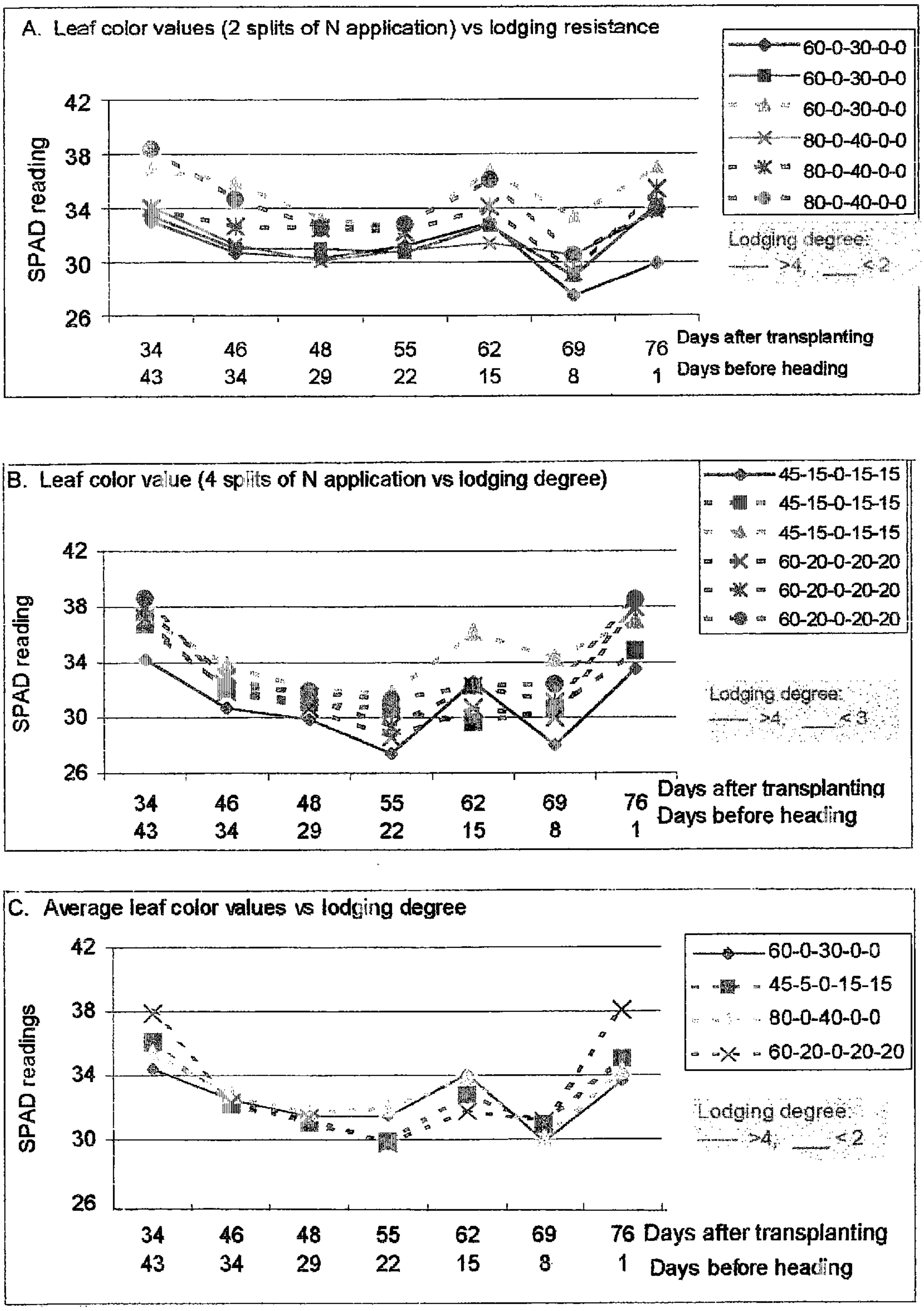


Figure 1. The leaf color values at different days after seeding IR62141-114-2-2-2 as affected by nitrogen rates and applications, and related to lodging degree observed after heading.

4-3-1-4. Weed control

In the WS, deep water (5 to 7 cm) introduced at 8 days after seeding controlled weeds fairly well without affecting seedling establishment. The yield was not significantly different in all the treatments although those with lower water depth had a 300 kg advantage than the higher water depth (Table 9). Pretilachlor at 1.5 l/ha sprayed at 1 to 3 DAS was very effective in the DS (Table 11) but its efficacy was a little bit inferior in the WS (Table 10). Bispyribac Na was also effective when applied at 6 to 9 DAS. Primibac-methyl+Bensulfuron-methyl+mefenacet sprayed at 7 to 10 DAS and Butachlor+Propanil sprayed at 8 DAS were also fairly effective. Combined use of Pretilachlor, applied at 1 DAS and Birpyribac Na at 25 DAS, was more effective in controlling weeds than the sole use of Pretilachlor.

Table 9. Effects of water depth and introduction days after sowing on weed growth at heading stage and rice yields, PhilRice Maligaya, 1999 WS.

Water depth (cm)	Water introduction (DAS)	Summed Dominance Ratio			Weed dry weights (g/m^2)	Yield (t/ha)
		Broadleaves	Sedges	Grasses		
5 to 7	2	0.65	0.14	0.22	62.34	2.27
	5	0.41	0.28	0.31	65.68	2.47
	8	0.38	0.14	0.47	30.42	3.25
	12	0.06	0.33	0.61	109.50	2.29
0 to 1	2	0.44	0.24	0.32	71.59	2.50
	5	0.06	0.34	0.60	39.13	2.81
	8	0.11	0.60	0.29	142.20	3.42
	12	0.31	0.33	0.36	82.32	2.93

Table 10. Effects of water management, nitrogen rates and herbicides on weed growth and rice yields, PhilRice Maligaya, 1999 DS.

Herbicides	Rate per ha	Application time (DAS)	N rates (kg/ha)	Weed number /m^2	Weed ODW (g/m^2)	Yield (t/ha)
Conventional (flooded) water management						
Pretilachlor	1.5 l	3	90	0	0	3.68
	1.5 l	3	120	0	0	3.53
Bispyribac Na	400 g	13	90	13	8.7	4.01
	400 g	13	120	50	20.3	3.57
Imazosulfuron + etobenzanid + daimuron	10 kg	14	90	90	49.6	3.11
	10 kg	14	120	109	73.8	1.95
Intermittent irrigation						
Pretilachlor	1.5 l	3	90	0	0	3.85
	1.5 l	3	120	0	0	3.91
Bispyribac Na	400 g	13	90	90	81.6	2.12
	400 g	13	120	170	70.5	2.27
Imazosulfuron + etobenzanid + daimuron	10 kg	14	90	344	244.4	0.74
	10 kg	14	120	140	107.9	1.08

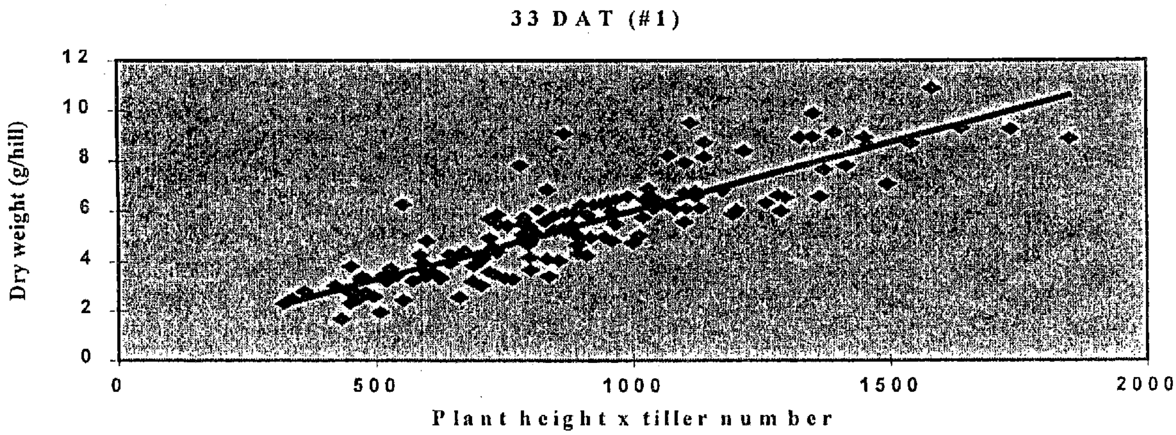
Table 11. Effects of different herbicides on the growth of weeds and yield of rice, PhilRice Maligaya, 1999 DS.

Herbicides	Rate/ha	Application time (DAS)	Weed number /m[2]	Weed ODW (g/m[2)])	Yield (t/ha)
Control	0	0	365	29.1	2.91
Pretilachlor	1.5 L	1	1	0.1	3.79
	1.5 L	3	10	0.7	4.75
Bispyribac Na	400 g	6	8	0.4	3.89
	400 g	9	35	2.6	3.73
Imazosulfuron + etobenzanid + daimuron	10 kg	7	207	13.6	2.27
	10 kg	10	160	13.0	3.25
Priminobac-methyl + bensulfuron-methyl mefenacet	10 kg	7	4	0.5	3.78
	10 kg	10	26	2.5	3.61
Pyrazosulfuron-ethyl + etobenzanid	10 kg	7	250	18.2	3.40
	10 kg	10	167	16.2	4.04
Butachlor + propanil	10 kg	8	29	2.9	3.97

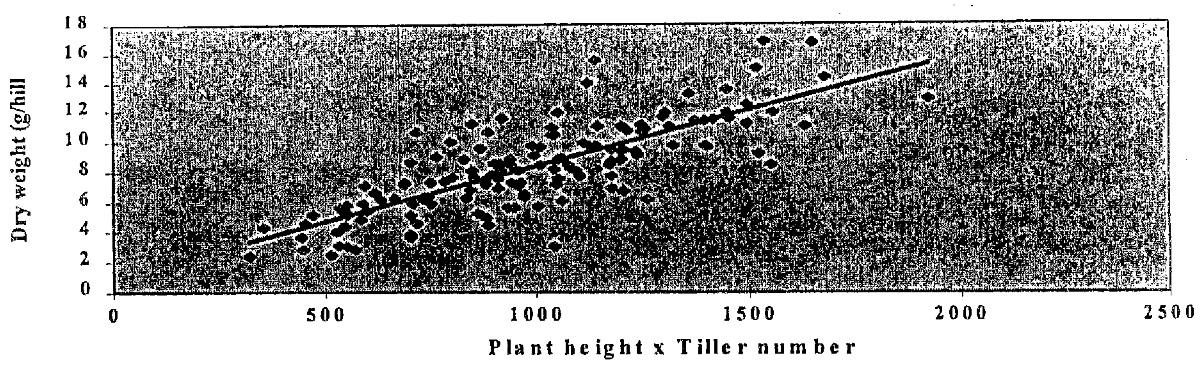
4-4. Soils and Fertilizers

4-4-1. Improvement of nutrient use efficiency

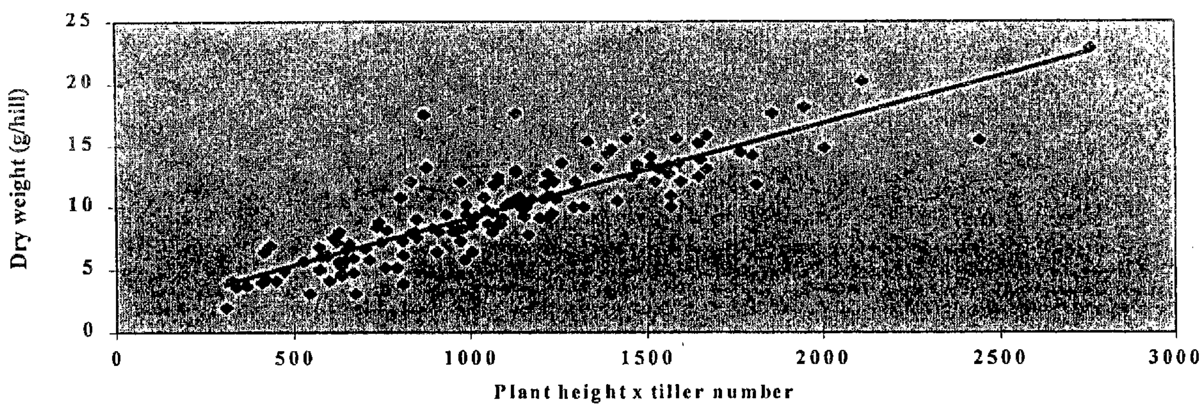
a. Non-destructively estimated dry matter accumulation by correlation with plant height and tiller number at different growth stages of rice plant (variety PSB Rc14)



39 DAT (#2)

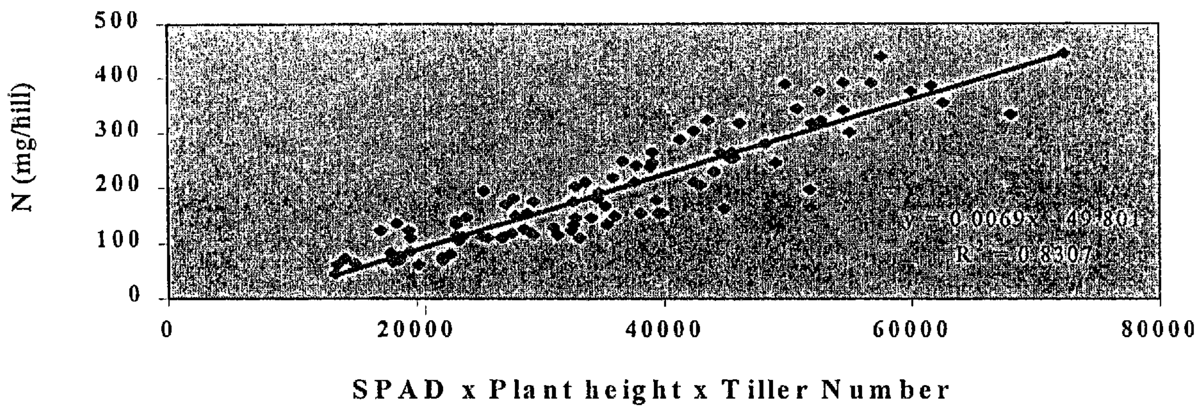


43 DAT (#3)



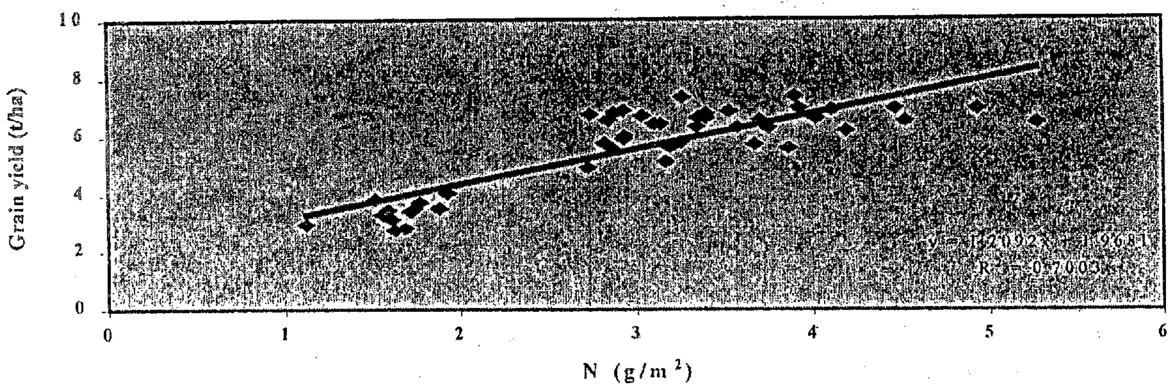
b. Estimated plant's nitrogen status at different growth stages of rice variety PSB Rc14 from growth parameters like plant height, tiller number and SPAD values

33 DAT

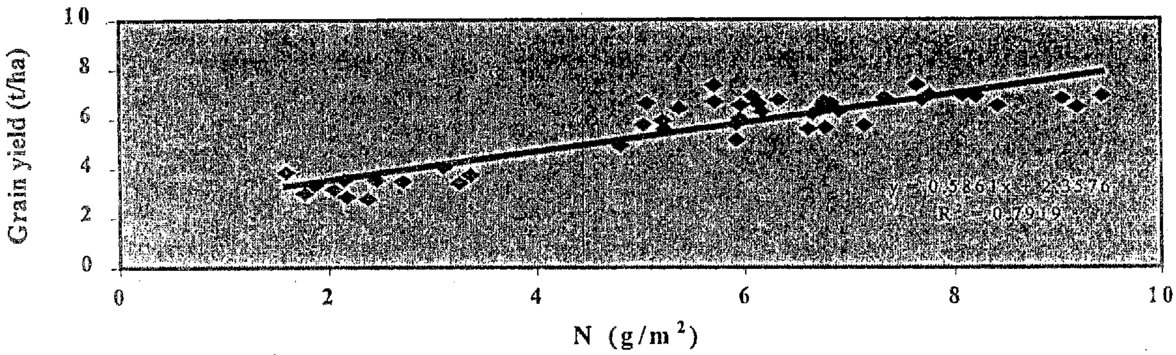


c. Correlated grain yield with the estimated plant's nitrogen status at different growth stages of rice variety PSB Rc14

33 DAT



43 DAT



d. Estimated nitrogen recovery efficiency and time course of nitrogen uptake under different rice straw management methods

N rate (kg ha^{-1})	% NRE Basal	% NRE Basal + topdress
Straw, removed		
90	27.7	48.5
120	24.9	44.8
150	29.4	46.2
Straw, Incorporated		
90	20.0	50.7
120	20.7	43.4
150	17.9	35.3
Straw, Burned		
90	21.9	50.9
120	30.1	38.9
150	17.5	41.9

% NRE = % of nitrogen recovery efficiency
N rate = two-thirds basal, one-third topdressed

e. N^{15} labelled nitrogen fertilizer was used to determine the efficiency of applied fertilizer at different growth stages -- 10 and 35 days after sowing (DAS), panicle initiation (PI), and flowering -- of direct-seeded rice variety PSB Rc28. The rice plants are still at flowering stage. Counterparts are being trained for N^{15} analysis technique by the short-term expert.

4-5. Crop Protection

4-5-1. Techniques for disease and insect management

The data on insect pest populations of the Technology Adaptation Research Project sites, namely: Talavera, Nueva Ecija; Bay, Laguna; Asuncion, Davao; Mambusao, Capiz; Ubay, Bohol; RTR, Agusan del Norte; Maramag, Bukidnon; and Kabacan, North Cotabato during the 1996 DS and WS were analyzed to determine pest profiles in each location. Population densities of insect pests in the 1996 DS were too low in all the location sites. The green leafhopper (GLH) population was observed in high density in Kabacan during both seasons. The rice leaf folder population was extremely high in Davao during the WS.

Different sampling methods in evaluating insect density/damage on rice and the standard index in evaluating occurrences of insect pests and damage of rice plants were suggested and are currently adapted in technology adaptation sites.

Major pests of rice in the eight technology adaptation sites, 1996 WS, DS.

Site	Major Pest
Talavera, Nueva Ecija	green leafhoppers (GLH), white backed planthoppers (WPH), brown planthoppers (BPH)
Bay, Laguna	GLH, WBPH, BPH
Asuncion, Davao	GLH, rice leaf folders
Mambusao, Capiz	GLH
Ubay, Bohol	GLH
RTR, Agusan Norte	GLH
Maramag, Bukidnon	GLH, BPH
Kabakan, North Cotabato	GLH

Suggested sampling method in evaluating insect density /damage on rice:

- Light trap – adults of stemborers and rice hoppers
- Sticky trap – rice hopper nymphs, predators
- Sweet net – rice hopper adults
- Visual count – for stemborer, rice hoppers and RLF damage
- Pheromone trap – for adult insects
- Plant dissection – larvae of stemborers and RLF

4-6. Rice Chemistry and Food Science

4-6-1. Improvement of techniques for rice grain quality evaluation

The best calibration/prediction equations for each grain quality parameter (AC, MC, and CP) are summarized in Table 1. The equations were chosen based on the values of some test statistics for correctness, namely: residual deviation (RSD), standard error of estimate (SEE), standard error of prediction (SEP), correlation coefficient (r) and coefficient of determination (r^2). The data suggest that the correctness of the NIR machine for measuring CP and MC is high but not so for AC. Such limitations can be attributed to the type of filter used in the machine, which is filter type. An NIR machine scanning filter may be more suitable for AC determination.

Table 1. Summary table for the best calibration equations of the NIR analyzer for MC, CP, and AC based on multiple linear correlation analysis.

TEST STATISTICS	GRAIN QUALITY PARAMETER		
	Moisture Content (MC)	Crude Protein (CP)	Amylose Content (AC)
Calibration			
Filters used	10, 11, 13, 14	8, 9, 10, 12, 14	9, 10, 17
SEE	0.201	0.370	4.324
r	0.943	0.959	0.613
r^2	0.889	0.9197	0.376
F	60.7	65.7	6.2
Prediction			
SEP	0.150	0.465	3.951
RMSD	0.154	0.495	4.106
RSD	0.155	0.496	4.127

4-7. Farm Management

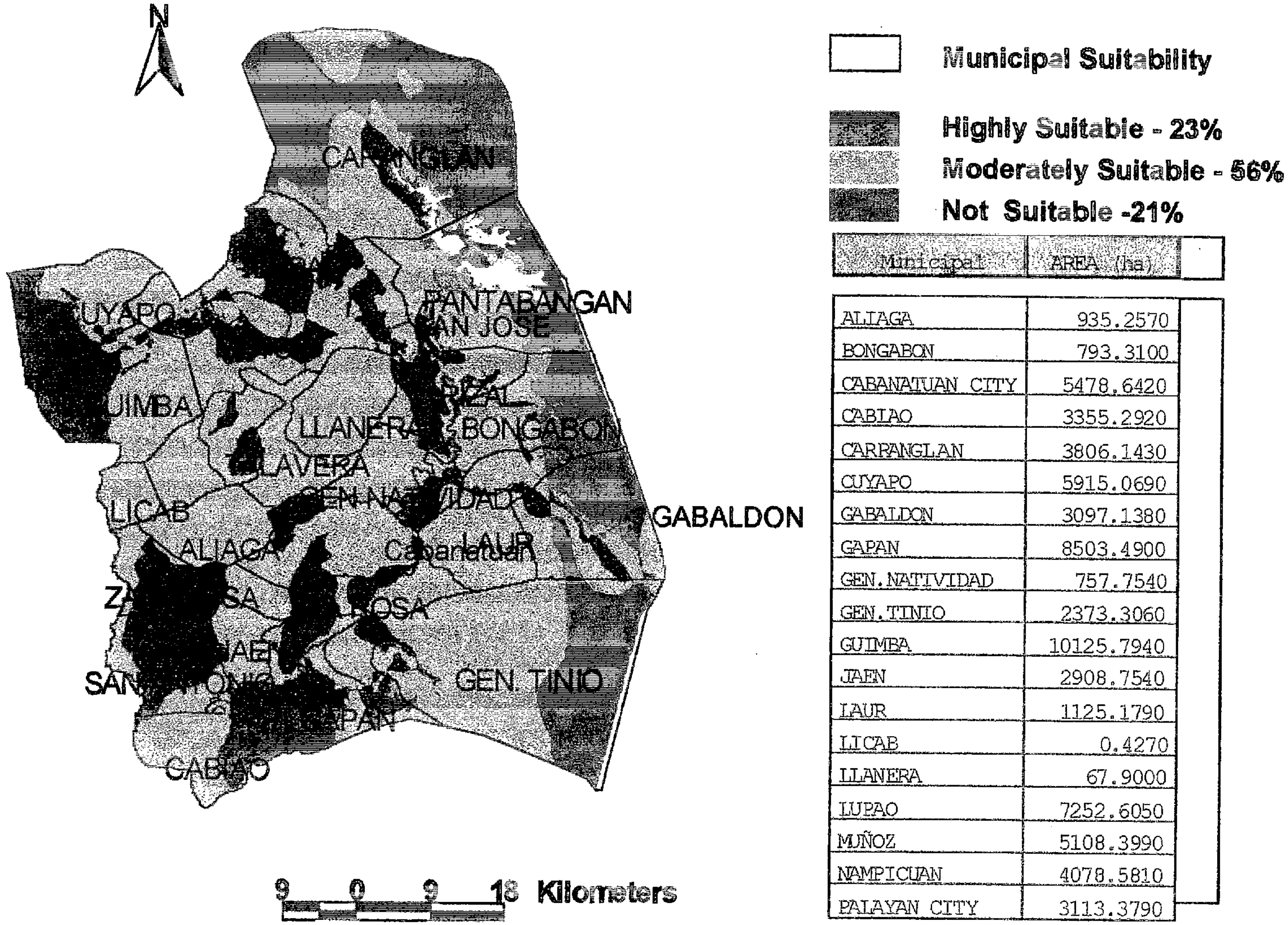
4-7-1. Monitoring and evaluation techniques of rice-based farming systems using Geographic Information System (GIS) technology

Using digitized maps on soil, geomorphology, agroclimatic and slope maps of Nueva Ecija, the project came up with a crop suitability map for the province by performing a series of overlays and reclassifications. It was found that 23% of the province is highly suitable to the rice-corn-mungbean cropping pattern, 56% is moderately suitable, and 21% is not suitable. The unsuitable areas are located near the mountain range of Sierra Madre (Figure 1).

A case study of Barangay Maligaya was also done showing the applications of GIS in farm management analysis and land-use planning. Results showed that some farmers in the area were not maximizing the utilization of their land efficiently and productively. Based on some criteria, land suitability analysis was also applied to assess and delineate areas suitable for vegetable cultivation (Figures 2 to 4).

The same case study site was characterized utilizing the power of GIS. Some of the observations are: farm size ranges from 1 to 1.5 ha; majority of the soils in Mali3gaya are clay loam; variety planted was mostly IR64; 84% of the area is irrigated; and the modal yield is from 4 to 5 t/ha during the WS and 5 to 5.5 t/ha during the DS (Figures 5 to 10).

Figure 1. Suitability Map for Rice-Corn-Mungbean Cropping Pattern in Nueva Ecija



Municipal	AREA (ha)
ALIAGA	935.2570
BONGABON	793.3100
CABANATUAN CITY	5478.6420
CABIAO	3355.2920
CARRANGLAN	3806.1430
CUYAPO	5915.0690
GABALDON	3097.1380
GAPAN	8503.4900
GEN.NATIVIDAD	757.7540
GEN.TINIO	2373.3060
GUIMBA	10125.7940
JAEN	2908.7540
LAUR	1125.1790
LICAB	0.4270
LLANERA	67.9000
LUPAO	7252.6050
MUÑOZ	5108.3990
NAMPICUAN	4078.5810
PALAYAN CITY	3113.3790

Figure 2. Land suitability map: Category A

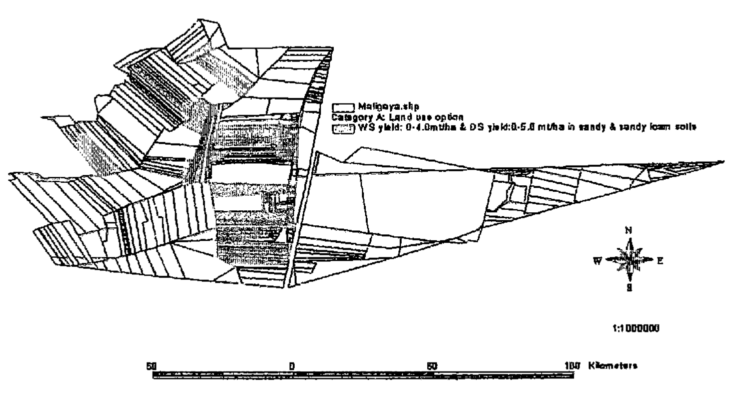


Figure 3. Land suitability map: Category B

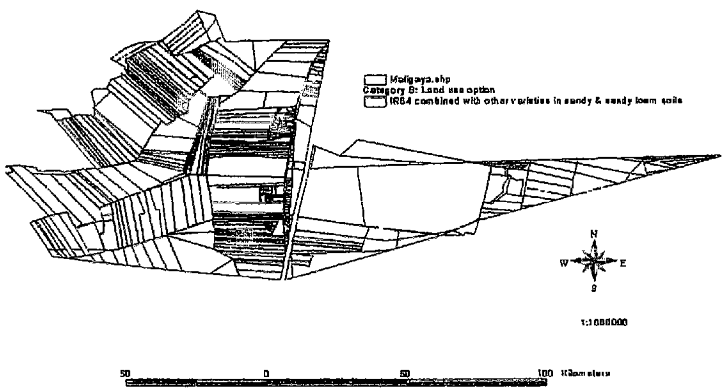


Figure 4. Land suitability map: Category C

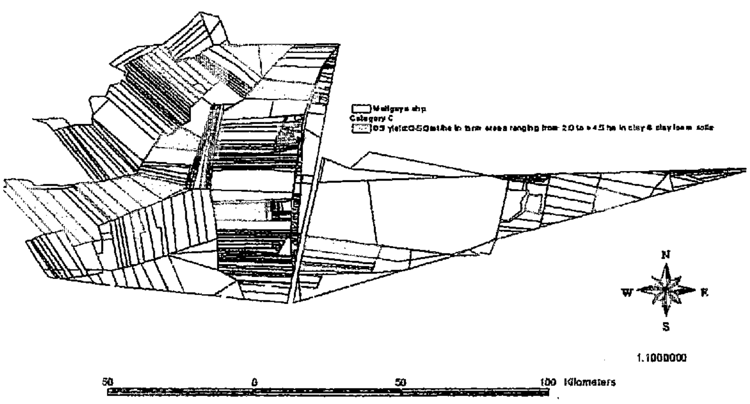


Figure 5. Farm type distribution of lot areas, Maligaya, Munoz, Nueva Ecija

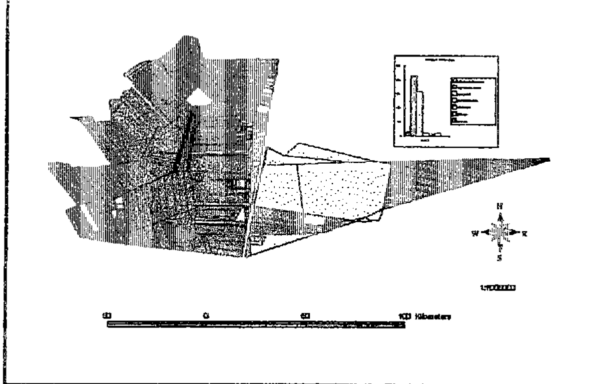


Figure 6. Farm size distribution, Maligaya, Munoz, Nueva Ecija

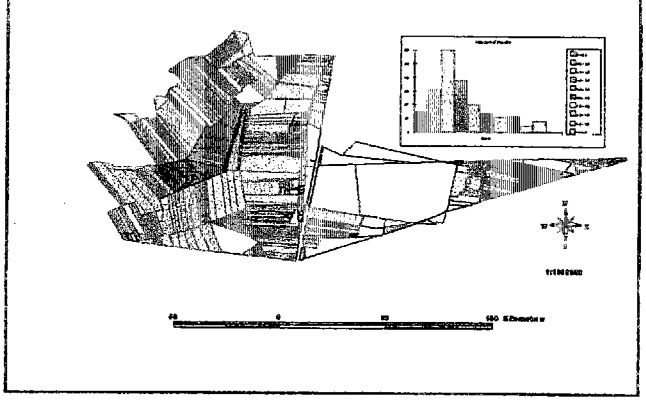


Figure 7. Soil type distribution of farm areas, Maligaya, Munoz, Nueva Ecija

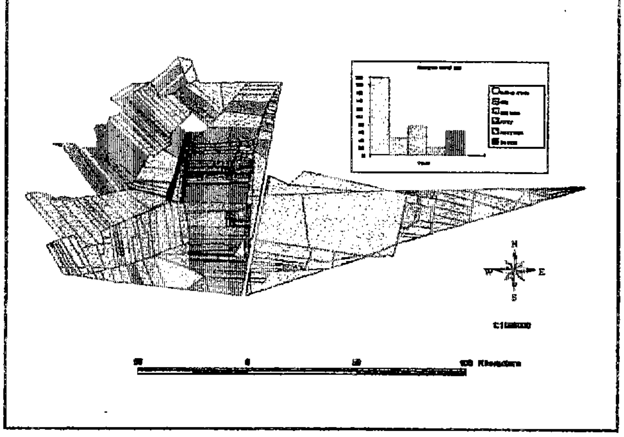


Figure 8. Distribution of variety pattern, Maligaya, Munoz, Nueva Ecija

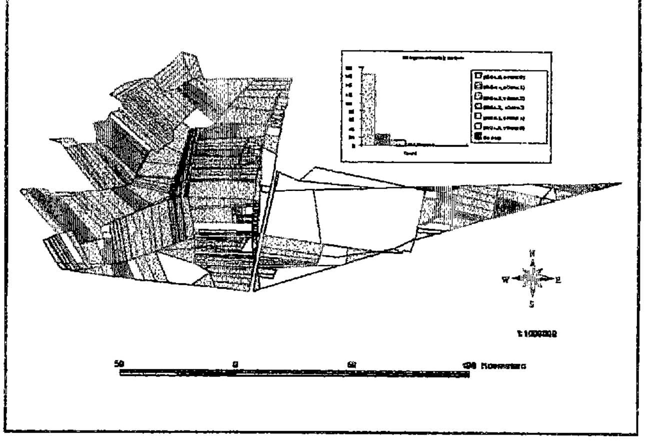


Figure 9. Map distribution of 1998 WS yield (mt/ha), Maligaya, Munoz, Nueva Ecija

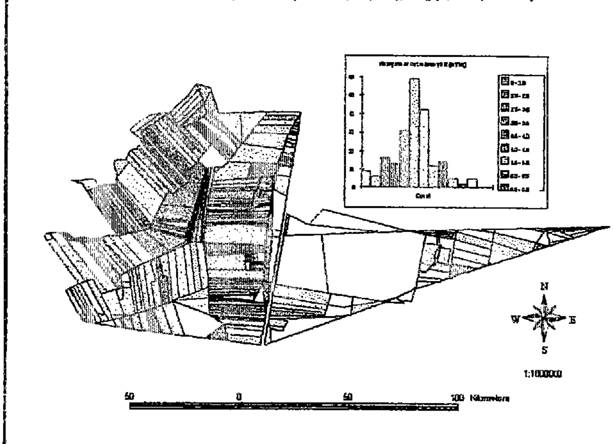
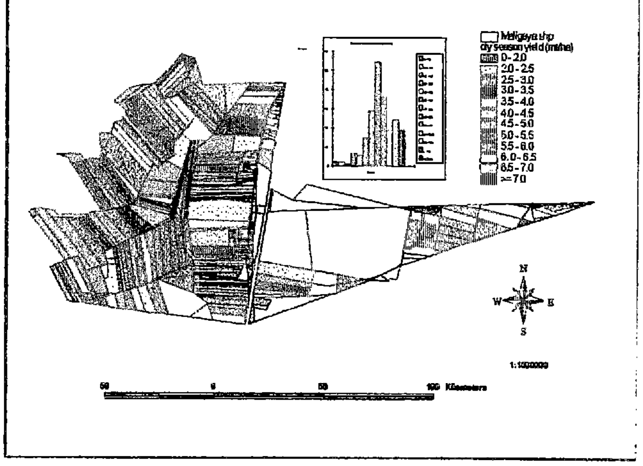


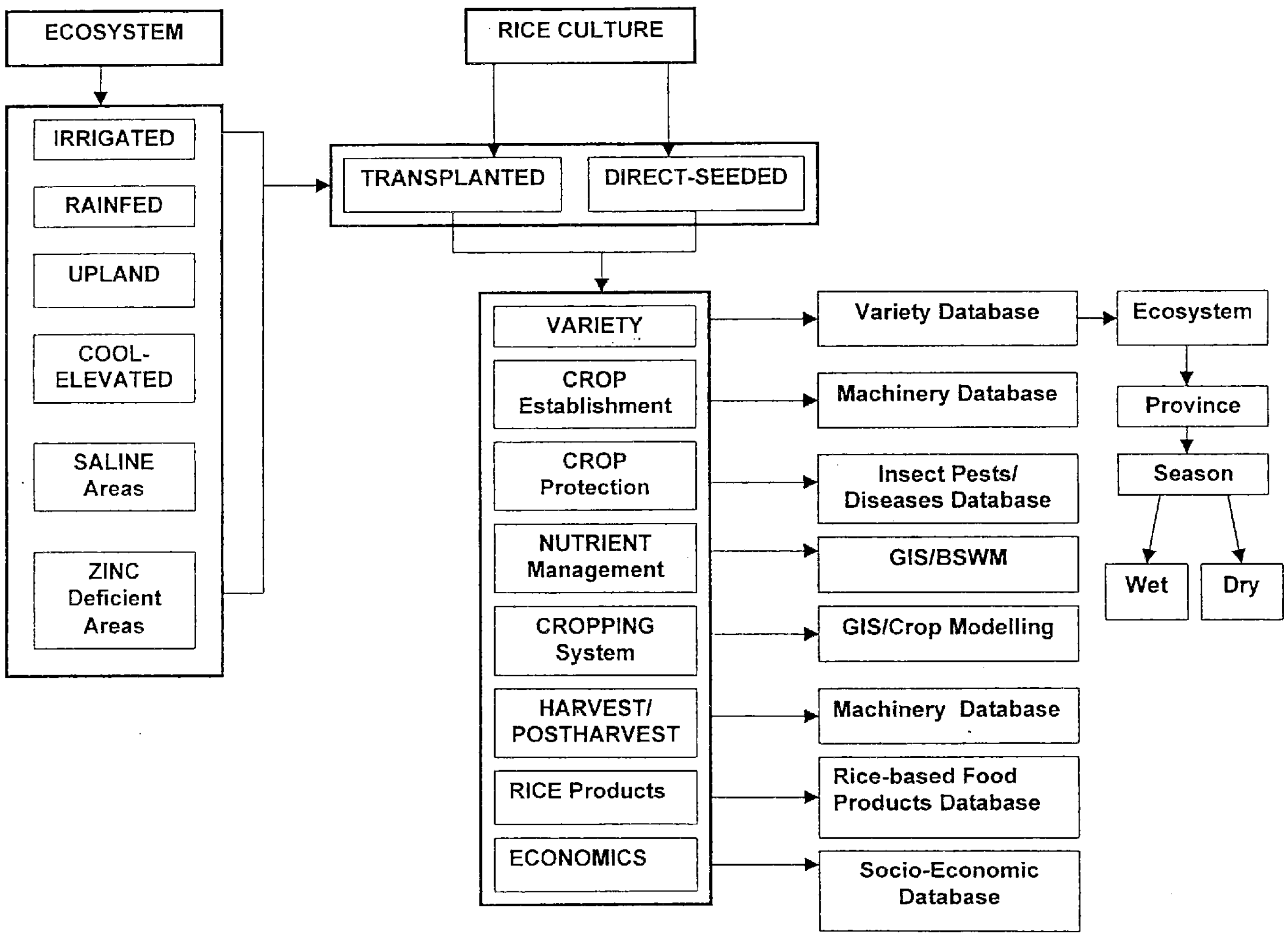
Figure 10. Map distribution of DS yield (mt/ha), Maligaya, Munoz, Nueva Ecija



4-8. Information Systems

4-8-1. Database for better transfer of rice technology information

Structure of rice technology database



When completed, this program will facilitate search and retrieval of all available rice technology information at PhilRice and in the national rice R&D network.

V. APPROACH TO THE ACCOMPLISHMENT INDICATORS OF PROJECT DESIGN MATRIX

V. APPROACH TO THE ACCOMPLISHMENT INDICATORS OF THE PROJECT DESIGN MATRIX (PDM)

1 (a). Existing PDM for Research and Development Project on High Productivity Rice Technology.

Cooperation term: August 1, 1997 – July 31, 2002
Drafted by the Consultation Team and PhilRice Team

Implementing organization: PhilRice, Department of Agriculture
Target group: Small-scale rice farmers

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Overall Goal High quality rice is supplied in sufficient quantity and farm management is stabilized through high productivity rice technologies which are sustainable for the conditions in rice growing areas.	• Stabilization of self-sufficiency in rice production • Improvement of farm management	Rice Statistics	Agricultural policies will not drastically change.
Specific Objective High productivity rice technologies for small-scale rice farmers are developed through the project implementation by the Philippine Rice Research Institute.	• Improvement of productivity through high yield and better grain quality	Farm management survey by PhilRice	Small-scale farmers adopt the technology developed by PhilRice.
Outputs of the Project 1) High-yielding and better quality rice varieties which are suitable for mechanization are developed. 2) Farm machinery for small-scale rice farmers are developed. 3) Cultivation techniques for labor-saving and high-yielding rice production are improved. 4) Rice quality evaluation techniques are improved. 5) Mechanized rice-based farm management systems are developed.	1) Twenty promising lines are developed 2) Four prototype machines are developed 3) Labor-saving at 25% in transplanted and 40% in direct-seeded rice; 10% yield increase 4) Faster rice grain quality evaluation techniques (200 samples/day) are developed 5) Two times faster evaluation and delivery of developed technologies are achieved	1) Commercial varieties 2) Prototypes 3) Cultivation techniques 4) Evaluation techniques 5) Adoption survey	Research activities and PhilRice commitment to the project will be maintained.
Activities of the Projects 1-1) To develop high-yielding and better quality promising lines for mechanized farming in irrigated lowlands. 1-2) To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas. 1-3) To evaluate local adaptability of promising lines. 2-1) To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition. 2-2) To develop rice harvesting machinery for small-scale farmers. 3-1) To develop techniques for direct-seeding cultivation. 3-2) To improve fertilizer application techniques for high-yielding and better quality rice. 3-3) To improve techniques for disease and insect pest management. 4-1) To improve techniques for rice grain quality evaluation. 5-1) To develop models of mechanized rice-based farm management. 5-2) To develop an information system for rice and rice-based farming technologies.	**Inputs** (Japanese side) 1. Dispatch of Experts (1) Long-term 1. Team Leader 2. Coordinator 3. Varietal Improvement 4. Farm Mechanization 5. Agronomy (2) Short-term (as needed) 2. Provision of machinery and equipment 3. Acceptance of Philippine counterpart personnel for training in Japan	(Philippine side) 1. Counterpart and administrative personnel 2. Land, buildings and facility 3. Repair or replacement of machinery 4. Maintenance and operating expenses	PhilRice will continue to conduct high quality research. PRE-CONDITION PhilRice will continue as an established rice research center in the Philippines.

1 (b). Revised Project Design Matrix (PDM) for the Research and Development Project on High Productivity Rice Technology (Version 3)

Cooperation term: August 1, 1997 – July 31, 2002
Drafted by the Japanese Advisory Team and Project Team

Implementing organization: PhilRice, Department of Agriculture
Target group: Small-scale rice farmers

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Overall Goal High quality rice is supplied in sufficient quantity and farm management is stabilized through high productivity rice technologies which are sustainable for the conditions in rice growing areas.	Rice self-sufficiency stabilized as a result of improved rice-based farm management practices.	National Statistics report on agriculture information from DA.	1. Agricultural policy on rice production does not change considerably. 2. Abnormal weather patterns do not occur and unexpected diseases and pests do not appear.
Specific Objective High productivity rice technologies for small-scale rice farmers are developed through the project implementation by the Philippine Rice Research Institute.	Rice productivity at the experimental level increased by 10% in both irrigated lowlands and cool-elevated areas. Labor requirements in rice cultivation decreased by 25% in transplanted and 40% in direct-seeded rice resulting from developed agricultural machinery and labor-saving cultivation techniques.	Farm management survey by PhilRice	1. Abnormal weather patterns do not occur and unexpected diseases and pests do not appear. 2. Small-scale farmers adopt the technology developed by PhilRice. 3. The Philippine government maintains a high priority for food security through increased rice production 4. Economic and social conditions remain stable in the Philippines.
Outputs of the Project 6) High-yielding and better quality rice varieties which are suitable for mechanization are developed. 7) Farm machinery for small-scale rice farmers are developed. 8) Cultivation techniques for labor-saving and high-yielding rice production are improved. 9) Rice quality evaluation techniques are improved. 10) Mechanized rice-based farm management systems are developed.	3) Twenty promising lines with: (a) higher yield than and comparable grain quality with IR64 developed for irrigated lowlands; (b) yield of cold-tolerant lines increased 10% higher than that of locally grown varieties. 4) Three prototype machines for plowing, harvesting, and gathering with 25% labor saved in transplanted, and 35% in direct-seeded rice as compared with existing practices. 6) Labor requirements in wet direct-seeded rice cultivation reduced by 5% and yield increased by 10%. 7) Rice grain quality evaluation capacity increased from 100 to 200 samples. 8) Evaluation and impact assessment model for new technologies developed; and a database for more reliable transfer of rice technology information produced.	6) Project record on rice varietal improvement 7) Project record on machinery 8) Project record on rice cultivation 9) Project record on rice grain quality evaluation 10) Project record on Farm management systems	1. Abnormal weather patterns do not occur and unexpected diseases and pests do not appear. 2. Research activities and PhilRice commitment to the Project are maintained. 3. The financial conditions of PhilRice remain stable. 4. The relevant research and experimental facilities of PhilRice are utilized efficiently.

Activities of the Projects 1-4) To develop high-yielding and better quality promising lines for mechanized farming in irrigated lowlands. 1-5) To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas. 1-6) To evaluate local adaptability of promising lines. 2-3) To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition. 2-4) To develop rice harvesting machinery for small-scale farmers. 3-4) To develop techniques for direct-seeding cultivation. 3-5) To improve fertilizer application techniques for high-yielding and better quality rice. 3-6) To improve techniques for disease and insect pest management. 4-2) To improve techniques for rice grain quality evaluation. 5-3) To develop models of mechanized rice-based farm management. 5-4) To develop an information system for rice and rice-based farming technologies.	**Inputs** <PHILIPPINE SIDE> 1. Philippine counterpart personnel 1.1 Project Director 1.2 Project Manager 1.3 Counterpart personnel for Japanese Experts 1.4 Administrative and other staff to support the Project activities 2. Physical facilities 2.1 Building, facilities, experimental fields, and other space for the Project 2.2 Space for the machinery and equipment 2.3 Electricity, water, and communication facilities 2.4 Other land, buildings and facilities necessary for the Project 3. Running expenses 3.1 Travel Cost for Field study and Supervision 3.2 Budget for research and extension activities 3.3 Maintenance and operating expenses 4. Others Management of the Joint Coordination Committee. <JAPANESE SIDE> 4. Japanese Experts Long-term (1.1 Team Leader; 1.2 Coordinator; 1.3 Varietal Improvement; 1.4 Farm Mechanization; 1.5 Agronomy) Short term (if necessary) 5. Technical Training of Philippine counterpart personnel in Japan. 6. Equipment and Machinery 3.1 Agricultural machinery, equipment, and spare parts; 3.2 Teaching materials and communication equipment including audio-visual equipment; 3.3 Technical instrument and equipment; 3.4 Vehicles for Field Survey; 3.5 Other equipment necessary for Project activities	1. The relevant research facilities including experimental fields are improved continuously and administered appropriately by PhilRice. 2. Customs formalities do not hinder the delivery of Equipment. 3. The PhilRice's budget is available for the implementation of the Project. 4. The trained PhilRice's researchers and technician continue to work with the Project. PRE-CONDITION 1. PhilRice continues as an established rice research center in the Philippines. 2. Relevant research institutions such as IRRI, SRDC, etc. and agricultural machinery manufacturers actively participate and support the Project. 3. Small-scale rice farmers in the Philippines agree with the objectives of the Project.

2. **Monitoring of the progress in accomplishments for PDM.**

Outputs of the Project	Objectively Verifiable Indicators	Achieved by the end of 1999	Plans		
			2000	2001	2002
1) High-yielding and better quality rice varieties suitable for mechanization	1) 20 promising lines	10 entry lines included in the National Cooperative Test	3	4	3
2) Farm machinery for small-scale rice farmers	2) 3 prototype machines	Technology options for: 1) tillage equipment, 2) reaper gatherer, and 3) small combine have been evaluated.	1) ——— 2) ——— 3) ———	——— ——— ———	———O ———O ———O
3) Cultivation techniques for labor-saving and high-yielding rice production	3) Labor-saving at 5% in direct-seeded rice; 10% yield increase	Labor-saving cultivation techniques being developed	——— ———	——— ———▶10%	———▶ 5%
4) Rice quality evaluation techniques	4) Faster rice grain quality evaluation techniques (200 samples/day)	200 samples/day (moisture and crude protein contents analyses)	———▶ 200 sam-ples/d		
5) Mechanized rice-based farm management systems	5) Two times faster evaluation and delivery of developed technologies	Information on rice technologies ready for conversion to HTML.	———	———	———▶ 2x faster

3. **Project Cycle Management (PCM) evaluation on the efficiency of input to output in FY 1997, 1998 and 1999.**

Field	Inputs			Situation of Assumptions
	Japanese side	Philippine side	Problems	
1) Varietal Improvement	1. Long-term expert 2. Provision of machinery and equipment 3. Counterpart (C/P) training: 2	1. Counterparts: 4 2. Facilities and experiment fields 3. Field workers 4. Operating expenses and materials	• Short viability of *japonica* rice seeds under tropical condition. • Breeding objectives became difficult to attain due to many emerging related problems • Delayed and poor growth at vegetative stage at the rice terraces	PhilRice activities and performance are not affected despite financial constraints
2) Farm Mechanization	1. Long-term expert 2. Short-term experts: 3 (Reaper & seeder) 3. Provision of machinery and equipment 4. C/P training: 2	1. Counterparts: 6 2. Facilities and experiment fields 3. Fabrication assistants 4. Operating expenses and materials	• Difficulty in good rice establishment	
3) Agronomy	1. Long-term expert 2. Short-term expert 3. Provision of machinery and equipment 4. C/P training: 2	1. Counterparts: 3 2. Facilities and experiment fields 3. Field workers 4. Operating expenses and materials	• Difficulty in good rice establishment	
4) Soil Chemistry	1. Short-term experts: 2 2. Provision of machinery and equipment	1. Counterparts: 3 2. Facilities and experiment fields 3. Field workers 4. Operating expenses and materials	• Difficulty in good rice establishment	

Field	Inputs			Situation of Assumptions
	Japanese side	Philippine side	Problems	
5) Plant Protection	1. Short-term expert: 1 2. Provision of machinery and equipment 3. C/P training: 1	1. Counterparts: 5 2. Facilities and experiment fields 3. Field workers 4. Operating expenses and materials	• Difficulty in good rice establishment	
6) Food Science	1. Short-term experts: 2 2. Provision of machinery and equipment 3. C/P training: 2	1. Counterparts: 3 2. Facilities 3. Operating expenses	• Low correlation between conventional method and NIR measurement was obtained for apparent amylose content	
7) Farm Management	1. Short-term expert: 2. Provision of machinery and equipment 3. C/P training: 1	1. Counterparts: 3 2. Facilities 3. Operating expenses	• Delays in geo-referencing of farmers' fields • Delays in replicating rice-corn-mungbean suitability analysis in other provinces	
8) Information System	1. Short-term expert 2. Provision of machinery and equipment 3. C/P training: 1	1. Counterparts: 3 2. Facilities 3. Operating expenses	• Lack of database program to access information	

4. PCM evaluation on:

1) the effectiveness of the output to object of the project,
2) the impact of the project implementation to the technology, environment, economy, social and policy, etc.
3) the relevance of the output, specific objective and overall goal as the target, and
4) the sustainability of the benefits from the project after termination of the technical cooperation will be done after the third year or fourth year of the implementation of the project.

VI. PLANS OF THE TECHNICAL COOPERATION FOR FY 2000-2002

VI. PLAN OF THE TECHNICAL COOPERATION FOR FY 2000-2002

1. Technical Cooperation Activities (Plan of Operation)

Plan of Operation in latter half for Rice Varietal Improvement
Project Outputs: High-yielding and better quality rice varieties which are suitable for mechanization are developed.

Items/Activities	Targets	Schedule 2000 DS	Schedule 2000 WS	Schedule 2001 DS	Schedule 2001 WS	Schedule 2002 DS	Responsible persons in the project	Inputs	Remarks
(1) Development of high-yielding and better quality promising lines for mechanized farming in irrigated lowland							Long term expert, counterparts, research assistants	Labor, seed storage, greenhouse, cold tolerance screening facility, experimental field	
(a) Development of high-yielding and better quality lines with less shattering and lodging resistance	Select high-yielding and better quality lines with less shattering and lodging resistance from the breeding lines and hybrid populations Screen for lodging resistance Clarify the most favorable degree of shattering resistance								
(b) Development of high-yielding and better quality lines for direct seeding cultivation	Select breeding lines with anaerobic tolerance and root lodging resistance. Pyramid these traits and other favorable traits Intensify mass screening and confirm under field condition								
(2) Development of cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas									

Items/Activities	Targets	Schedule					Responsible persons in the project	Inputs	Remarks
		2000		2001		2002			
		DS	WS	DS	WS	DS			
(a) Development of high-yielding lines with strong cool-temperature tolerance	. Evaluate and select breeding lines in the target sites Evaluate site and compare with the general conditions Improve water and nutrient management technologies Establish practical screening technique for efficient use of the cold tolerance screening facility Establish screening methods for partial or field resistance to blast								
(b) Development of high-yielding lines with cool-temperature tolerance and good grain quality	Implement as in Item (2)(a). Search *japonica* germplasm with resistance to viviparity and long viability under tropical condition								
(3) Evaluation of local adaptability of promising lines									
(a) Evaluation of promising lines in the NCT and other local adaptability tests	Evaluate elite lines across sites and seasons in the NCT trials for yield and other agronomic traits, insect and disease resistance, and grain quality Strengthen monitoring activities								

DS: dry season WS: wet season

Plan of Operation in latter half for Farm Mechanization
Project Outputs: Farm machinery for small scale farmers are developed.

Items/Activities	Targets	Schedule 2000 DS	Schedule 2000 WS	Schedule 2001 DS	Schedule 2001 WS	Schedule 2002 DS	Responsible persons in the project	Inputs	Remarks
(1) Development of machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition							Long term expert, counterparts	Technician, labor, mechanization center, test field	
(a) Development of land preparation equipment for direct-seeding	Develop equipment for plowing the portion of land adjacent to levees								
(b) Improvement of performance of hand-tractor -mounted seeder									accomplished
(c) Development of direct-seeding equipment									cancelled
(2) Development of rice harvesting machinery for small-scale farmers									
(a) Improvement of reaper models	Monitor and improve commercialized models								Extension
(b) Development of crop gathering equipment	Modify rake-type and vertical straw gathering devices								
(c) Development of small combine harvester for rice	Fabricate and improve self-propelled combine harvester model								

DS: dry season WS: wet season

Plan of Operation in latter half for Agronomy, Soils and Fertilizer, Plant Protection
Project Outputs: Cultivation techniques for labor-saving and high-yielding rice production are improved.

Items/Activities	Targets	Schedule					Responsible persons in the project	Inputs	Remarks
		2000		2001		2002			
		DS	WS	DS	WS	DS			
(1) Development of techniques for direct-seeding cultivation							Long term expert, counterparts, research assistants	Labor, fertilizer, crop service building, experimental field	
(a) Search for the ideal plant type for direct seeding	Evaluate more varieties and lines for their suitability for wet-direct seeding Determine lodging resistance and yield performance of these varieties								
(b) Improvement of land preparation for better crop establishment	Study further labor-saving land preparation and pre-germinated seed treatment for best seedling establishment								
(c) Development of direct-seeding cultivation for increased yield	Establish proper nitrogen and water management to attain high yield potential without encountering problem of lodging Study integration of land preparation, water management, and herbicide application for a comprehensive or integrated weed control								

DS: dry season WS: wet season

Items/Activities	Targets	Schedule					Responsible persons in the project	Inputs	Remarks
		2000		2001		2002			
		DS	WS	DS	WS	DS			
(2) Improvement of fertilizer application techniques for higher yielding and better quality rice							Short term expert, counterpart, research assistant	Labor, fertilizer, experimental field, crop service building, laboratory equipment	
(a) Improvement of nutrient-use efficiency	Establish optimal N content of rice plants for high yield of different modern varieties Introduce the N^{15} labelled nitrogen method for the determination of nitrogen fertilizer efficiency								
(3) Improvement of techniques for disease and insect pest management							Short term expert, counterpart, research assistant	Labor, laboratory equipment	
(a) Synthesis and utilization of nationwide historical data on insect pest incidence in the development of location-specific insect pest profiles	Monitor pest using the sticky board								
(b) Development of standard techniques to determine the mechanisms of resistance of rice cultivars to rice blast disease	Conduct preliminary studies to determine the mechanisms of resistance of selected rice cultivars to blast disease Define goals/targets/ methodology for the mechanism of resistance to blast								

DS: dry season WS: wet season

Plan of Operation in latter half for Rice Chemistry and Food Science
Project Outputs: Rice quality evaluation techniques are improved.

Items/Activities	Targets	Schedule					Responsible persons in the project	Inputs	Remarks
		2000		2001		2002			
		DS	WS	DS	WS	DS			
(1) Improvement of techniques for rice grain quality evaluation							Short term expert, counterpart, research assistant	Laboratory equipment	
(a) Highly efficient measurement of moisture and nutrient contents of rice grain by Near-Infrared Reflectance (NIR)	Determine rice grain properties other than moisture, amylose and protein using NIR Identify milled rice samples as authentic or adulterated using NIR spectra profiles								
(b) Establishment of criteria for predicting processing qualities of rice	Identify critical combination of rice properties necessary for the production of high quality products like *tapuy* and rice cakes								

DS: dry season WS: wet season

Plan of Operation in latter half for Farm Management and Information System
Project Outputs: Mechanized rice-based farm management models are developed.

Items/Activities	Targets	Schedule 2000 DS	2000 WS	2001 DS	2001 WS	2002 DS	Responsible persons in the project	Inputs	Remarks
(1) Development of models of mechanized rice-based farm management							Short term expert, counterpart		
(a) Development of farm management models for evaluating mechanized rice-based farming systems	Georeference farmers' fields for monitoring Monitor labor-use and other input-use								
(b) Development of techniques for monitoring and evaluation of rice-based farming systems using Geographic Information System (GIS) technology	Digitize map of rice areas of the Philippines desegregated by province Acquire thematic maps on slope, soil texture, soil type, rainfall, and groundwater								
(2) Development of an information system for rice and rice-based farming technologies							Short term expert, counterpart	Computer facilities	
(a) Development of farm database for better transfer of rice technology information	Convert information to HTML Write in CD-ROM Develop databases								

DS: dry season WS: wet season

2. Dispatch of Japanese Experts in FY 2000

Field	2000									2001		
	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1. Long-term Experts												
1) Team Leader	—	—	—	—	—	—	—	—	—	—	—	—
2) Coordinator	—	—	—	—	—	—	—	—	—	—	—	—
3) Varietal Improvement	—	—	—	—	—	—	—	—	—	—	—	—
4) Farm Mechanization	—	—	—	—	—	—	—	—	—	—	—	—
5) Agronomy	—	—	—	—	—	—	—	—	—	—	—	—
2. Short-term Experts												
1) Farm Management	●		○			—	—					
2) Plant Pathology	●		○				—	—				
3) Soils and Fertilizer	●		○							—	—	

●: Submit A1 Form ○: Agreement ———— : Assignment Period

3. Training of Philippine Personnel in Japan in FY 2000

Field	Name/Position	Training Period	Affiliation/Destination
1) Information System	Mr. Roger F. BARROGA Information Tech Officer III	2000.05 ~ 2000.09	JICA Okinawa International Center
2) Plant Breeding	Dr. Renande O. SOLIS Supvg. Sci. Res. Specialist	2000.05 ~ 2000.11	Tohoku National Agricultural Experiment Station
3) Soils and fertilizers	Mr. Jovino L. DE DIOS Sr. Sci. Res. Specialist	2000.05 ~ 2000.09	National Agriculture Research Center
4) Seed Production	Dr. Frisco M. MALABANAN Chief Sci. Res. Specialist	2000.08 ~ 2000.10	Hokuriku National Agricultural Experiment Station and NARC

4. Provision of Machinery and Equipment

Field/Item	2000									2001		
	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1) Purchased in Japan			O				O	✪	X			
2) Purchased in the Philippines					O			X		O	X	O X
3) Brought by Short-term Expert						O	X			O	X	
							O	X				

O: Purchases Order O: Shipping ✪: Arrival in the Philippines X: Arrival at PhilRice

VII. APPENDICES

RECORDS OF DISCUSSIONS BETWEEN JAPANESE IMPLEMENTATION STUDY TEAM AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF THE PHILIPPINES ON JAPANESE TECHNICAL COOPERATION FOR THE RESEARCH AND DEVELOPMENT PROJECT ON HIGH PRODUCTIVITY RICE TECHNOLOGY

Department of Agriculture
PHILIPPINE RICE RESEARCH INSTITUTE
Maligaya, Muñoz, Nueva Ecija

May 28, 1997

**RECORD OF DISCUSSIONS
BETWEEN JAPANESE IMPLEMENTATION STUDY TEAM
AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF
THE REPUBLIC OF THE PHILIPPINES
ON JAPANESE TECHNICAL COOPERATION
FOR THE RESEARCH AND DEVELOPMENT PROJECT
ON HIGH PRODUCTIVITY RICE TECHNOLOGY**

The Japanese Implementation Study Team (hereinafter referred to as "the Team") organized by the Japan International Cooperation Agency, headed by Mr. Shoji Furuya, visited the Republic of the Philippines from May 20 to 29, 1997 for the purpose of working out the details of the technical cooperation program concerning the Research and Development Project on High Productivity Rice Technology in the Republic of the Philippines.

During its stay in the Republic of the Philippines, the Team exchanged views and had a series of discussions with the Philippine authorities concerned with respect to desirable measures to be taken by both Governments for the successful implementation of the above-mentioned Project.

As a result of the discussions, the Team and the concerned Philippine authorities agreed to recommend to their respective Governments the matters referred to in the document attached hereto.

Manila, 28 May, 1997

Shoji Furuya
Leader
Implementation Study Team
Japan International Cooperation Agency

Santiago R. Obien
Director
Philippine Rice Research Institute
Republic of the Philippines

Confirmed: ______________________
Rodolfo C. Undan
Assistant Secretary
Department of Agriculture
Republic of the Philippines

ATTACHED DOCUMENT

I. COOPERATION BETWEEN BOTH GOVERNMENTS

1. The Government of the Republic of the Philippines will implement the Research and Development Project on High Productivity Rice Technology (hereinafter referred to as "the Project") in cooperation with the Government of Japan.

2. The Project will be implemented in accordance with the Master Plan which is given in Annex I.

II. MEASURES TO BE TAKEN BY THE GOVERNMENT OF JAPAN

In accordance with the laws and regulations in force in Japan, the Government of Japan will take, at its own expense, the following measures through the Japan International Cooperation Agency (hereinafter referred to as "JICA") according to the normal procedures under the Colombo Plan Technical Cooperation Scheme.

1. DISPATCH OF JAPANESE EXPERTS
   The Government of Japan will provide the services of the Japanese experts as listed in Annex II.

2. PROVISION OF MACHINERY AND EQUIPMENT
   The Government of Japan will provide such machinery, equipment, and other materials (hereinafter referred to as "the Equipment") necessary for the implementation of the Project as listed in Annex III. The Equipment will become the property of the Government of the Republic of the Philippines upon being delivered C.I.F. to the concerned Philippine authorities at the port(s) and / or airport(s) of disembarkation.

3. TRAINING OF PHILIPPINE PERSONNEL IN JAPAN
   The Government of Japan will receive Philippine personnel connected with the Project for technical training in Japan.

III. MEASURES TO BE TAKEN BY THE GOVERNMENT OF THE REPUBLIC OF THE PHILIPPINES

1. The Government of the Republic of the Philippines will take necessary measures to ensure a self-reliant operation of the Project during and after the period of Japanese technical cooperation, through the full and active involvement in the Project of all related authorities, beneficiary groups, and institutions.

2. The Government of the Republic of the Philippines will ensure that the technologies and knowledge acquired by the Philippine nationals as a result of Japanese technical cooperation will contribute to the economic and social development of the Republic of the Philippines.

3. The Government of the Republic of the Philippines will grant privileges, exemptions, and benefits to the Japanese experts referred to in II-1 above and their families, which are no less favorable than those accorded to experts of third countries working in the Republic of the Philippines under the Colombo Plan Technical Cooperation Scheme.

4. The Government of the Republic of the Philippines will ensure that the Equipment referred to in II-2 above will be utilized effectively for the implementation of the Project in consultation with the Japanese experts referred to in Annex II.

5. The Government of the Republic of the Philippines will take necessary measures to ensure that the knowledge and experience acquired by the Philippine personnel from technical training in Japan will be utilized effectively in the implementation of the Project.

6. In accordance with the laws and regulations in force in the Republic of the Philippines, the Government of the Republic of the Philippines will take necessary measures to provide, at its own expense, for the project:

   (1) Services of the Philippine counterpart personnel and administrative personnel as listed in Annex IV;

   (2) Land, buildings, and facilities as listed in Annex V;

   (3) Supply or replacement of machinery, equipment, instruments, vehicles, tools, spare parts and any other materials necessary for the implementation of the Project other than the Equipment provided through JICA under II-2 above;

   (4) Means of transport and travel allowances for the Japanese experts for their official travels within the Republic of the Philippines; and

   (5) Suitably furnished accommodations for the Japanese experts and their families.

7. In accordance with the laws and regulations in force in the Republic of the Philippines, the Government of the Republic of the Philippines will take necessary measures to meet the following:

   (1) Expenses necessary for transportation within the Republic of the Philippines of the Equipment referred to in II-2 above as well as for the installation, operation, and

maintenance thereof;

(2) Customs, duties, internal taxes, and any other charges imposed in the Republic of the Philippines on the Equipment referred to in II-2 above; and

(3) Running expenses necessary for the implementation of the Project.

IV. ADMINISTRATION OF THE PROJECT

1. The Secretary of the Department of Agriculture, as the Project Director, will bear overall responsibility for the implementation of the Project.

2. The Director of the Philippine Rice Research Institute, as the Project Manager, will be responsible for the administrative, managerial, and technical matters of the Project.

3. The Japanese Team Leader will provide the necessary recommendations and advice to the Project Manager on technical and administrative matters pertaining to the implementation of the Project.

4. The Japanese experts will give the necessary technical guidance and advice to the Philippine counterpart personnel on technical matters pertaining to the implementation of the Project.

5. For the effective and successful implementation of technical cooperation for the Project, a Joint Coordination Committee will be established whose functions and composition are described in Annex VI.

V. JOINT EVALUATION

Evaluation of the Project will be conducted jointly by the two Governments through JICA and the Philippine authorities concerned, at the middle and during the last six months of the cooperation term in order to examine the level of achievement.

VI. CLAIMS AGAINST JAPANESE EXPERTS

The Government of the Republic of the Philippines shall bear claims, if any arises, against the Japanese experts engaged in technical cooperation for the Project resulting from, occurring in the course of, or otherwise connected with, the discharge of their official functions in the Philippines except for those arising from the willful misconduct or gross negligence of the Japanese experts.

VII. MUTUAL CONSULTATION

There will be mutual consultation between the two Governments on any major issues arising from, or in connection with this Attached Document.

VIII. MEASURES TO PROMOTE UNDERSTANDING OF AND SUPPORT FOR THE PROJECT

For the purpose of promoting support for the Project among the people of the Philippines, the Government of the Republic of the Philippines will take appropriate measures to make the Project widely known.

IX. TERM OF COOPERATION

The duration of technical cooperation for the Project under this Attached Document will be for five (5) years from August 1, 1997.

ANNEX I MASTER PLAN

1. OBJECTIVES OF THE PROJECT

(1) Overall goal

High quality rice is supplied in sufficient quantity and farm management is stabilized through high productivity rice technologies which are sustainable for the conditions in rice growing areas.

(2) Project purpose

High productivity rice technologies for small-scale rice farmers are developed through the Project implementation by the Philippine Rice Research Institute.

2. OUTPUTS OF THE PROJECT

(1) High-yielding and better quality rice varieties which are suitable for mechanization are developed.

(2) Farm machinery for small-scale rice farmers are developed.

(3) Cultivation techniques for labor-saving and high-yielding rice production are improved.

(4) Rice quality evaluation techniques are improved.

(5) Mechanized rice-based farm management systems are developed.

3. ACTIVITIES OF THE PROJECT

1-1) To develop high-yielding and better quality promising lines for mechanized farming in irrigated lowlands.

1-2) To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas.

1-3) To evaluate local adaptability of promising lines.

2-1) To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition.

2-2) To develop rice harvesting machinery for small-scale farmers.

3-1) To develop techniques for direct-seeding cultivation.

3-2) To improve fertilizer application techniques for higher yielding and better quality rice.

3-3) To improve techniques for disease and insect pest management.

4-1) To improve techniques for rice grain quality evaluation.

5-1) To develop models of mechanized rice-based farm management.

5-2) To develop an information system for rice and rice-based farming technologies.

ANNEX II LIST OF JAPANESE EXPERTS

1. Long-term experts

   (1) Team Leader

   (2) Coordinator

   (3) Experts in the fields of:

      1) Varietal Improvement

      2) Farm Mechanization

      3) Agronomy

   Note: The Team Leader may serve concurrently as an expert in one of the fields mentioned above.

2. Short -term expert(s)

   Short-term expert(s) will be dispatched when necessity arises for the smooth implementation of the Project.

ANNEX III LIST OF MACHINERY AND EQUIPMENT

1. Machinery and equipment for activities of varietal improvement
2. Machinery and equipment for activities of farm mechanization
3. Machinery and equipment for activities of agronomy
4. Vehicles and their spare parts
5. Other necessary equipment and materials for the technical cooperation

ANNEX IV LIST OF PHILIPPINE COUNTERPARTS AND OTHER PERSONNEL

1. Project Director
2. Project Manager
3. Necessary number of Counterpart Personnel for long- and short-term experts
4. Administrative Personnel
    (1) Administrative Officers
    (2) Accounting and Budget Officers
    (3) Secretaries
    (4) Drivers

ANNEX V LIST OF LAND, BUILDINGS, AND FACILITIES

1. Buildings, facilities, and office space for the Project
2. Space for the machinery and equipment provided
3. Electricity and communication facilities
4. Other land, buildings, and facilities necessary for the implementation of the Project

ANNEX VI JOINT COORDINATION COMMITTEE

1. Function

The Joint Coordination Committee will meet at least once a year and whenever necessity arises, to:

(1) Formulate the Annual Work Plan of the Project in line with the Tentative Schedule of Implementation to be formulated under the framework of the Record of Discussions;

(2) Review the overall progress of the technical cooperation program as well as the achievements of the above-mentioned Annual Work Plan; and

(3) Review and exchange views on major issues arising from or in connection with the Project.

2. Composition

(1) Chairman: Secretary, Department of Agriculture (DA)

(2) Vice Chairman: Undersecretary for Research, Training and Regional Operations, DA

(3) Members :

a) Director, PhilRice

b) Deputy Director, PhilRice

c) Director, Bureau of Agricultural Research, DA

d) Chief, Project Assistance Division, Special Concerns Office, DA

e) Director, Agriculture Staff, National Economic and Development Authority (NEDA)

f) Director, Project Monitoring Staff, NEDA

g) Deputy Executive Director for Research, Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)

h) Dean, College of Agriculture, University of the Philippines Los Banos

i) Team Leader, JICA

j) Coordinator, JICA

k) Experts, JICA

l) Personnel concerned to be dispatched by JICA, if necessary

m) Resident Representative of JICA Philippine Office

n) Official(s) of the Embassy of Japan, as observer(s)

TENTATIVE SCHEDULE OF IMPLEMENTATION OF JAPANESE TECHNICAL COOPERATION FOR THE RESEARCH AND DEVELOPMENT PROJECT ON HIGH PRODUCTIVITY RICE TECHNOLOGY

The Japanese Implementation Study Team (hereinafter referred to as "the Team") and the authorities concerned of the Republic of the Philippines have jointly formulated the herein Tentative Schedule of Implementation (TSI) of the Research and Development Project on High Productivity Rice Technology (hereinafter referred to as "the Project") as annexed hereto.

This TSI has been formulated in accordance with the Attached Document of the Record of Discussions signed between the Team and the Philippine authorities concerned with the Project on condition that the necessary budget will be allocated by both Governments, and that the schedule is subject to change within the framework of Record of Discussions.

Manila, 28 May, 1997

Shoji Furuya
Leader
Implementation Study Team
Japan International Cooperation Agency

Santiago R. Obien
Director
Philippine Rice Research Institute
Republic of the Philippines

Confirmed:

Rodolfo C. Undan
Assistant Secretary
Department of Agriculture
Republic of the Philippines

5/28/97

1. Activities of the Project

Item / Activity (Year)	Schedule 1997	1998	1999	2000	2001	2002
1. High-yielding and better quality rice varieties which are suitable for mechanization are developed.						
(1) To develop high-yielding and better quality promising lines for mechanized farming in irrigated lowland.						
(2) To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas.						
(3) To evaluate local adaptability of promising lines.						
2. Farm machinery for small-scale rice farmers are developed.						
(1) To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition.						
(2) To develop rice harvesting machinery for small-scale farmers.						
3. Cultivation techniques for labor-saving and high-yielding rice production are improved.						
(1) To develop techniques for direct-seeding cultivation.						
(2) To improve fertilizer application techniques for higher yielding and better quality rice.						
(3) To improve techniques for disease and insect pest management.						
4. Rice quality evaluation techniques are improved.						
(1) To improve techniques for rice grain quality evaluation.						
5. Mechanized rice-based farm management systems are developed.						
(1) To develop models of mechanized rice-based farm management.						
(2) To develop an information system for rice and rice-based farming technologies.						

87 when necessity arises

2. Technical Cooperation Program (Japanese Side)

Item/Activity \ Year	Schedule					
	1997	1998	1999	2000	2001	2002
1. Dispatch of Long-term Experts						
(1) Team Leader*	—	—	—	—	—	—
(2) Coordinator	—	—	—	—	—	—
(3) Varietal Improvement	—	—	—	—	—	—
(4) Farm Mechanization		—	—	—	—	—
(5) Agronomy		—	—	—	—	—
2. Dispatch of Short-term Expert(s) (When necessity arises)	—	—	—	—	—	—
3. Provision of Machinery and Equipment	—	—	—	—	—	—
4. Acceptance of Philippine Counterpart Personnel for training in Japan (A few personnel or meembers per year)	—	—	—	—	—	—
5. Dispatch of Missions (When necessity arises)	—	—	—	—	—	—

* Team Leader may serve concurrently as an expert in one of the fields mentioned above.

3. Technical Cooperation Program (Philippine Side)

Item/Activity \ Year	Schedule					
	1997	1998	1999	2000	2001	2002
1. Counterpart						
(1) Project Director	———	———	———	———	———	———
(2) Project Manager	———	———	———	———	———	———
(3) Counterpart personnel for long-term experts	———	———	———	———	———	———
(4) Counterpart personnel for short-term experts (When necessity arises)	———	———	———	———	———	———
(5) Administrative personnel members	———	———	———	———	———	———
2. Allocation of running cost of the Project	———	———	———	———	———	———
3. Land, Buildings, Facilities, and Equipment	———	———	———	———	———	———

MINUTES OF UNDERSTANDING ON THE RECORD OF DISCUSSIONS BETWEEN JAPANESE IMPLEMENTATION STUDY TEAM AND AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF THE PHILIPPINES ON JAPANESE TECHNICAL COOPERATION FOR THE RESEARCH AND DEVELOPMENT PROJECT ON HIGH PRODUCTIVITY RICE TECHNOLOGY

The Japanese Implementation Study Team (hereinafter referred to as "the Team") and the authorities concerned of the Republic of the Philippines had a series of discussions and signed the Record of Discussions (hereinafter referred to as "R/D") on the Technical Cooperation for the Research and Development Project on high Productivity Rice Technology in the Republic of the Philippines.

The minutes of understanding attached hereto documents the details of the R/D.

Manila, May 28, 1997

Shoji Furuya
Leader
Implementation Study Team
Japan International Cooperation Agency

Santiago R. Obien
Director
Philippine Rice Research Institute
Republic of the Philippines

Confirmed:
Rodolfo C. Undan
Assistant Secretary
Department of Agriculture
Republic of the Philippines

Attached Document

1. List of Philippine Counterparts

Both sides confirmed that the Government of the Republic of the Philippines would assign counterparts (Annex I) for the Japanese experts.

2. Project Preparation

The Government of the Republic of the Philippines will submit the application forms (A1 Form) for five (5) long-term Japanese experts to the Embassy of Japan by the end of June 1997, the form for the provision of machinery and equipment (A4 Form), and the form for technical training of Philippine staff (A2 ,3 Form) as soon as possible after consultation with the Japanese side through the JICA Philippines Office.

3. Project Design Matrix

The Team and the concerned authorities of the Republic of the Philippines agreed that the Project would be implemented in accordance with Project Design Matrix (hereinafter referred to as the "PDM") in Annex II of this minutes and the Master Plan in the Record of Discussions. The PDM describes and summarizes the necessary activities to be implemented. The Government of Japan will assist within the scope of the Master Plan.

4. Farm Mechanization in the Republic of the Philippines

(1) In the Philippines at present, small-sized machines, such as power tiller for land preparation, are mainly used. In the future, labor shortage in the rural areas is forecast owing to migration to urban areas as a result of industrialization. The mechanization of harvesting is also expected for release from heavy labor.

(2) In farm mechanization, the development of both harvesting and post-harvesting machines for high yielding and high quality varieties, and machines for direct-seeding to address labor shortage are desired.

(3) The gradual progress of mechanization does not give serious effect on landless farmers. In the progress of mechanization, it is possible for landless farmer to find a job.

5 Workshop Equipment and Laboratory Test Instruments

The workshop equipment and laboratory test instruments for the development of machinery were requested by the Philippine side.

6. Necessity of GIS for the Development of the Models for the Rice-Based Farm Management

In the development of models for mechanized rice-based farm management, farm level and regional aspects are important. To visualize the results of monitoring and evaluation of land use and effects of mechanization at the village levels, a simple PC-based GIS (Geographic Information System) or mapping system will be useful.

7. Acquisition of Hardware for the Development of the Rice Technology Database

The upgrading and acquisition of computers and computer accessories for the development of the rice technology database shall be provided by PhilRice starting in 1997. Because of insufficient communication infrastructure, CD-R (compact disk rewritable) is considered as one of the most suitable media for the delivery of technology information in the Rice R&D Network.

ANNEX I List of Philippine Counterparts

Management	
Santiago R. Obien	Director
Ronilo A. Beronio	Deputy Director
Coordination	
Eulito U. Bautista	Scientist I
Nestor C. Martin	Division Chief for Finance
Teodora L. Briones	Science Research Specialist II
Varietal Improvement	
Hilario C. dela Cruz	Chief Science Research Specialist
Leocadio S. Sebastian	Supervising Science Research Specialist
Rodante E. Tabien	Senior Science Research Specialist
Thelma F. Padolina	Senior Science Research Specialist
Emily R. Corpuz	Science Research Specialist II
Farm Mechanization	
Eulito U. Bautista	Scientist I
Manuel Jose C. Regalado	Senior Science Research Specialist
Ricardo F. Orge	Senior Science Research Specialist
Eden C. Gagelonia	Senior Science Research Specialist
Rizaldo E. Aldas	Senior Science Research Specialist
Joselito A. Damian	Science Research Specialist II
Agronomy	
Rolando T. Cruz	Chief Science Research Specialist
Teodula M. Corton	Supervising Science Research Specialist
Edna Marie S. Punzalan	Supervising Science Research Specialist
Evelyn F. Javier	Senior Science Research Specialist
Madonna C. Casimero	Senior Science Research Specialist
Fernando D. Garcia	Science Research Specialist II
Hilario D. Justo Jr.	Chief Science Research Specialist
Leandro M. Sanchez	Supervising Science Research Specialist
Alejandra B. Estoy	Supervising Science Research Specialist
Gerardo F. Estoy Jr.	Senior Science Research Specialist
Rice Chemistry & Food Science	
James A. Patindol	Senior Science Research Specialist
Juma Novie B. Ayap	Senior Science Research Specialist
Marissa V. Romero	Senior Science Research Specialist
Nanette V. Zulueta	Science Research Specialist II
Evelyn M. Herrera	Science Research Specialist I
Farm Management	
Segfredo R. Serrano	Chief Science Research Specialist
Sergio R. Francisco	Supervising Science Research Specialist
Rogelio D. Cosio	Senior Science Research Specialist
Irene R. Tanzo	Science Research Specialist II
Cheryll B. Casiwan	Science Research Specialist I
Alice M. Briones	Science Research Specialist I

Technology Promotion	
Leo C. Javier	Chief Science Research Specialist
Roger F. Barroga	Supervising Science Research Specialist
Ruben C. Miranda	Senior Science Research Specialist
Paterno I. Rebuelta	Senior Science Research Specialist
Olive Rose O. Matchoc	Science Research Specialist II

Annex II Project Design Matrix (Tentative)

The Research and Development Project on High Productivity Rice Technology

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS*	MEANS OF VERIFICATION*	IMPORTANT ASSUMPTIONS*
Overall goal High quality rice is supplied in sufficient quantity and farm management is stabilized through high-productivity rice technologies which are sustainable for the conditions in rice growing areas	• Stabilization of self-sufficiency in rice production • Improvement of farm management	Survey and other means	Agricultural policy will not be drastically changed
Specific Objective High productivity rice technologies for small-scale rice farmers are developed at the Philippine Rice Research Institute	• Improvement of productivity through high and better grain quality	Survey and other means	Small-scale farmer adopted the technology developed at PhilRice
Output of the Project 1) High-yielding and better quality rice lines which are sustainable for mechanization are developed 2) Farm machinery for small-scale rice farmers is developed 3) Cultivation techniques for labor-saving and high-yielding rice production are improved 4) Rice quality evaluation techniques are improved 5) mechanized rice-based farm management systems are developed	1) Several promising lines are developed 2) A few prototype machinery are developed 3) Labor-saving of 25% in transplanted, 40% in direct seeded rice, 10% yield increase 4) Faster and more accurate rice quality evaluation techniques are mastered 5) Faster evaluation and delivery of developed technology	1) Commercial release of varieties 2) Prototypes 3) Publication of cultivation techniques 4) Techniques for evaluation 5) Survey for adoption	Research activity and management of PhilRice will be maintained
Activities 1-1) To develop high-yielding and better-quality promising lines for mechanized farming in irrigated lowlands 1-2) To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas 1-3) To evaluate local adaptability of promising lines 2-1) To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition 2-2) To develop rice harvesting machinery for small-scale farmers 3-1) To develop techniques for direct seeding cultivation 3-2) To improve fertilizer application techniques for higher-yielding and better quality rice 3-3) To improve techniques for disease and insect pest management 4-1) To improve techniques for rice grain quality evaluation 5-1) To develop models for mechanized rice-based farm management 5-2) To develop an information system for rice and rice-based farming technologies	Inputs (Japanese side) 1. Dispatch of Experts (1) Long-term 1. Team Leader 2. Coordinator 3. Varietal Improvement 4. Farm Mechanization 5. Agronomy (2) Short-term (as needed) 2. Provision of machinery and equipment 3. Acceptance of Philippine counterpart personnel members for training in Japan (a few personnel members per year)	(Philippine side) 1. Counterpart and administrative personnel 2. Land, buildings and facilities 3. Repair or replacement of machinery 4. Maintenance and operating expenses	PhilRice staff will continue high quality research **PRECONDITION** PhilRice is a established rice research center in the Philippines

* INDICATORS, MEANS OF VERIFICATION and ASSUMPTIONS are to be further discussed upon commencement of the Project

Annex III List of the Team Members

(1) Mr. Shoji FURUYA (Leader)
Deputy Director General,
Tohoku National Agricultural Experiment Station (N.A.E.S),
Ministry of Agriculture, Forestry and Fisheries (MAFF)

(2) Dr. Koichiro OKAZAKI (Farm Mechanization)
Team Leader, Research Project Team 1,
Department of Integrated Research for Agriculture,
Chugoku N.A.E.S, MAFF

(3) Dr. Teruaki NANSEKI (Agricultural Management)
Chief, Division of Socio-Economic Analysis,
Department of Integrated Research,
Tohoku N.A.E.S, MAFF

(4) Mr. Takanobu NAWASHIRO (Technical Cooperation)
Special Technical Advisor,
Japan International Cooperation Center

MEMORANDUM

Detailed Activities of the Project

1. Varietal Improvement

1-1) To develop high-yielding varieties and better quality promising lines for mechanized farming in irrigated lowlands

A. Development of high-yielding and better-quality lines with less shattering and lodging resistance

B. Development of high-yielding and better-quality lines for direct seeding cultivation

1-2) To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas

A. Development of high-yielding lines with cool-temperature tolerance

B. Development of high-yielding lines with good grain quality

1-3) To evaluate local adaptability of promising lines

2. Farm Mechanization

2-1) To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition

A. Development and improvement of machinery suitable for land preparation for direct-seeding

B. Development and improvement of seeding implements for direct- seeding

C. Field and laboratory tests of prototypes for commercial release

2-2) To develop rice harvesting machinery for small-scale farmers

A. Adaptability tests of existing and promising prototypes

B. Improvement and refinement of the prototype harvesting machines

C. Design and fabrication of a prototype rice combine

3. Agronomy, Soils and Fertilizers, and Crop Protection

3-1) To develop techniques for direct-seeding cultivation

A. Search for ideal plant types for direct- seeding cultivation

B. Improvement of land preparation and weed control for better crop establishment

C. Development of high-yielding direct- seeding cultivation

3-2) To improve fertilizer application techniques for higher yielding and better quality rice

A. Improvement of nutrient use efficiency and soil properties by the use of organic and inorganic fertilizers under various soil conditions

3-3) To improve techniques for disease and insect pest management

A. Synthesizing and packaging of historical data on pest incidence to develop IPM (Integrated Pest Management) decision-making strategies

B. Development of techniques to study the mechanism of resistance of rice cultivars to major diseases

4. Rice Chemistry and Food Science

4-1) To improve techniques for rice grain quality evaluation

A. Highly efficient estimation of moisture, amylose, protein, and lipid contents by the use of NIR (Near Infra-Red) analysis

B. Establishment of criteria for predicting processing qualities of rice

5. Farm Management and Technology Transfer

5-1) To develop models for mechanized rice-based farm management

A. Development of a farm management model for evaluating mechanized rice-based farming

B. Development of a simple PC-based GIS (Geographic Information System) or mapping system for improved monitoring and evaluation of rice-based farming at the village level

5-2) To develop an information system for rice and rice-based farming technologies

A. Development of a multimedia database for better transfer of rice technology information to the Rice R&D Network .

Schedule

May 20	Arrival at MANILA
	Courtesy call to JICA Office
	Courtesy call to Embassy of Japan
May 21	Visit NEDA (PIS, AS)
	Courtesy call to DA Assistant Secretary
	Leave for PhilRice
	Arrive at PhilRice, Courtesy call to the Director
May 22	Welcome Remarks
	PhilRice Story
	Video on JICA Project
	Facility and Field Tour
	Discussion with PhilRice staff
May 23	Continuation of Discussions
	Mission's Meeting
May 24	Visit rice farmers and machinery shop
May 25	Mission's Meeting
May 26	Continuation of Discussions
May 27	Preparation of Minutes
	Leave for Manila
May 28	Exchange of Minutes at DA with Assistant Secretary
	Report to NEDA
	Report to the Embassy of Japan
	Report to JICA Office
May 29	Leave for Japan

List of Personnel Met

Philippine Rice Research Institute (PhilRice)

Dr. Santiago R. Obien	Director
Mr. Ronilo A. Beronio	Deputy Director
Mr. Hilario C. dela Cruz	Head, Plant Breeding and Biotechnology Division (PBBD)
Dr. Leocado S. Sebastian	Supervising Science Research Specialist, PBBD
Dr. Rolando T. Cruz	Head, Agronomy and Soils Division (ASD)
Dr. Teodula M. Corton	Program Leader, Planting and Fertilizer Management
Dr. Hilario D. Justo	Head, Crop Protection Division (CPD)
Dr. Alejandra B. Estoy	Supervising Science Research Specialist, CPD
Engr. Manuel Jose C. Regalado	Head, Rice Engineering and Mechanization Division (REMD)
Engr. Eden C. Gagelonia	Senior Science Research Specialist, REMD
Mr. James A. Patindol	Head, Rice Chemistry and Food Science Division (RCFSD)
Ms. Juma Novie B. Ayap	Senior Science Research Specialist, RCFSD
Dr. Segfredo R. Serrano	Head, Social Science and Policy Research Division (SSPR)
Dr. Sergio R. Francisco	Supervising Science Research Specialist, SSPR
Mr. Roger F. Barroga	Head, Communication Division
Ms. Karen Eloisa T. Barroga	Senior Science Research Specialist, Communication Division
Ms. Zyla C. Macasieb	Head, Training Division
Engr. Leo Javier	Head, Technology Promotion Division
Dr. Frisco M. Malabanan	Chief, Seed Production and Health Division
Arch. Renato B. Bajit	Chief, Physical Plant Division
Mr. Nestor C. Martin	Chief, Finance Division
Mr. Eduardo D. Bacolod	Senior Science Research Specialist, PCPO
Mr. Luis Alejandre I. Tamani	Science Research Specialist II, PCPO

Experts in PhilRice

Dr. Hitoshi Takahashi	Leader, JICA Expert Team
Mr. Masaru Imamura	Coordinator
Mr. Toshio Ito	Varietal Improvement
Mr. Teruhisa Motomatsu	Soils and Fertilizers
Mr. Hideo Matsuhashi	Short-term Expert on Agricultural Extension Service

National Economic Development Authority

Ms. Cristina C. Santiago	Economic Development Specialist, Public Investment Staff
Ms. Susan S. Cruz	Senior Economic Development Specialist, Agriculture Staff

Department of Agriculture

Dr. Rodolfo C. Undan	Assistant Secretary
Ms. Luz Brenda Valebrea	Project Development Officer II, Research and Project Development Division
Ms. Susana de Guzman	Project Development Officer II, International Agricultural Development Cooperation Office

Embassy of Japan

Mr. Toru Okuda	First Secretary (Agriculture)

Japan International Cooperation Agency, Philippines Office

Mr. Hiroshi Goto	Resident Representative
Mr. Akira Nakamura	Assistant Resident Representative

MINUTES OF UNDERSTANDING BETWEEN THE JAPANESE CONSULTATION TEAM AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF THE REPUBLIC OF THE PHILIPPINES ON JAPANESE TECHNICAL COOPERATION FOR THE RESEARCH AND DEVELOPMENT PROJECT ON HIGH PRODUCTIVITY RICE TECHNOLOGY

Department of Agriculture
PHILIPPINE RICE RESEARCH INSTITUTE
Maligaya, Muñoz, Nueva Ecija

March 25, 1998

MINUTES OF UNDERSTANDING
BETWEEN THE JAPANESE CONSULTATION TEAM
AND THE AUTHORITIES CONCERNED OF THE GOVERNMENT OF
THE REPUBLIC OF THE PHILIPPINES
ON JAPANESE TECHNICAL COOPERATION
FOR THE RESEARCH AND DEVELOPMENT PROJECT
ON HIGH PRODUCTIVITY RICE TECHNOLOGY

The Japanese Consultation Team (hereinafter referred to as "the Team") organized by Japan International Cooperation Agency (hereinafter referred to as "JICA") and headed by Dr. Tsugufumi Ogawa visited the Republic of the Philippines from March 17 to 27, 1998 for the purpose of formulating the detailed Tentative Schedule of Implementation for the Research and Development Project on High Productivity Rice Technology (hereinafter referred to as "the Project") as well as discussing the major issues related to the implementation of the Project.

During its stay in the Republic of the Philippines, the Team exchanged views and had a series of discussions with the authorities concerned of the Government of the Philippines in respect of various issues for sharing common understanding on the Project.

Understanding between the Team and the authorities concerned of the Government of the Philippines is recorded as shown in the document attached hereto.

Manila, March 25, 1998

Tsugufumi Ogawa	Santiago R. Obien
Leader	Exective Director
Consultation Team	Philippine Rice Research Institute
Japan International Cooperation Agency	Department of Agriculture

Confirmed: ____________________

SALVADOR H. ESCUDERO III
Secretary
Department of Agriculture
The Republic of the Philippines

ATTACHED DOCUMENT

1. Purpose of the Project

The Team and the Philippine side confirmed the purpose of the Project that was mentioned in the master plan of the Record of Discussions signed in Manila on May 28, 1997.

2. Inputs of the technical cooperation program

2-1. Japanese inputs

2-1-1. Long-term experts

Four long-term experts have been dispatched as Team leader, Coordinator, and Experts in the fields of Varietal Improvement and Farm Mechanization. The expert in the field of Agronomy will be dispatched on April 16, 1998.

2-1-2. Short-term experts

Three short-term experts have been dispatched in the fields of farm mechanization (one expert each for rice reaper and rice seeder), and agronomy during the FY 1997.

2-1-3. Acceptance of the Philippine counterpart personnel for training in Japan

Two counterparts are being trained in Japan on farm mechanization and agricultural extension; and two others are scheduled in the fields of food science and information processing within the FY 1997.

2-1-4. Provision of equipment, machinery, and materials

Vehicles and equipment for the implementation of the project activities will be provided.

2-2. Philippine inputs

2-2-1. Assignment of counterpart personnel and administrative staff

A project director, a project manager, five counterparts in varietal improvement, four each in farm mechanization and agronomy have been assigned to work with Japanese experts.

Sixteen staff members in rice chemistry and food science, farm management, and technology transfer have been assigned as counterparts, and are ready to work with Japanese experts.

2-2-2. Provision of land, buildings, and other necessary facilities

Facilities and equipment for this project were provided under the Japanese grant-aid program in 1991. Office space for Japanese experts, laboratories, experiment fields, and other necessary buildings and facilities have been provided.

2-2-3. Allocation of current budget for the Project

Budget for office equipment, consumables, telephone, fax, and electricity have been allocated.

3. Outputs and progress of project activities

3-1. Varietal Improvement

3-1-1. To develop high-yielding and better quality promising lines for mechanized farming in irrigated lowlands.

To determine genetic potential, 174 parents were assembled and will be used for hybridization.

Materials selected from previous 1997 wet season were presently planted for evaluation of traits relevant to direct seeding cultivation.

3-1-2. To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool elevated areas.

Eight highly cool-temperature tolerant germplasm were selected under the natural condition in Benguet based on fertility, maturity, and shattering. On-site selection generated 43 breeding lines from Benguet, and 166 in Banaue for the reproductive cool-temperature tolerance while 36 were re-evaluated for tolerance at the seedling stage.

3-1-3. To evaluate local adaptability of promising lines.

Three promising lines were tested in the National Cooperative Test (NCT); PJ2 was evaluated as tolerant to cool-temperature and is a candidate for pre-release.

3-2. Farm Mechanization

3-2-1. To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition.

Leveling equipment and hand tractor mounted seeder were already developed, but plowing machine would be developed for tilling non-tilled portion along levees.

3-2-2. To develop rice harvesting machinery for small-scale farmers.

The PhilRice rotary reaper was already developed and field trial demonstrated its satisfactory performance. However, durability studies for the equipment will be conducted.

3-3. Agronomy, Soils and Fertilizers, and Crop Protection

3-3-1. To develop techniques for direct-seeding cultivation.

The problems in wet direct seeding rice cultivation were identified, and the research and development strategies for improving its productivity were formulated.

3-3-2. To improve fertilizer application techniques for higher yielding and better quality rice.

This was not implemented during the FY 1997. It will be started during the FY 1998.

3-3-3. To improve techniques for disease and insect pest management.

There was no plan for carrying out this item within the first implementation year. It will be started in the second implementation year.

3-4. Rice Chemistry and Food Science

3-4-1. To improve techniques for rice grain quality evaluation.

There was no plan for carrying out this item within the first implementation year. It will be started in the second implementation year.

3-5. Farm Management and Technology Transfer

3-5-1. To develop models of mechanized rice-based farm management.

There was no plan for carrying out this item within the first implementation year. It will be started in the second implementation year.

3-5-2. To develop an information system for rice and rice-based farming technologies.

There was no plan for carrying out this item within the first implementation year. It will be started in the second implementation year.

9

4. Tentative Schedule of Implementation (TSI)

The Team and the Philippine side refined the tentative schedule of implementation signed in Manila on May 28, 1997 as shown in the Annex I.

This schedule shows detailed project activities based on the TSI. There is no substantial difference between the two schedules.

4-1. Varietal Improvement

4-1-1. To develop high-yielding and better quality promising lines for mechanized farming in irrigated lowlands.

A. Development of high-yielding and better quality lines with less shattering and lodging resistance.

Further improvement of the less shattering, lodging resistant, and excellent grain quality of the indica/japonica lines developed for transplanting during the preceding project.

B. Development of high-yielding and better quality lines for direct seeding cultivation.

Establishment of screening methods for germplasm tolerant to anaerobic conditions. Introduction of the direct seeding suitable traits such as root lodging resistance and seedling vigor by backcrossing into the leading varieties and promising lines.

4-1-2. To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas.

A. Development of high-yielding lines with strong cool-temperature tolerance.

Development of artificial screening methods for cool-temperature tolerance. Screening of the cool-temperature tolerant germplasm as potential donor parents.

On-site breeding for the development of very early maturing, high-yielding lines with strong tolerance to cool-temperature and suitable for high elevation areas.

B. Development of high-yielding lines with cool-temperature tolerance and good grain quality.

Development of early maturing high yielding lines with cool-temperature tolerance and good grain quality suitable for medium elevation areas.

4-1-3. To evaluate local adaptability of promising lines.

A. Evaluation of promising lines in the NCT and other local adaptability tests.

Identification of outstanding lines for general or location-specific recommendations. Further improvement of breeding through information obtained from local adaptability tests.

4-2. Farm Mechanization

4-2-1. To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition.

A. Development of land preparation equipment for direct seeding.

Improvement of performance of equipment for tillage.

B. Improvement of performance of hand tractor mounted seeder.

Refinement for commercial release.

C. Development of direct seeding equipment.

Development of broadcast seeders. Performance evaluation of developed models for extension.

4-2-2. To develop rice harvesting machinery for small-scale farmers.

A. Improvement of reaper models.

Refinement for commercial release.

B. Development of crop gathering equipment.

Development of a reaper model equipped with gathering function.

C. Development of small combine harvesters for rice.

Development of prototype combine harvesters.

4-3. Agronomy, Soils and Fertilizers, and Crop Protection

4-3-1. To develop techniques for direct-seeding cultivation.

A. Search for the ideal plant type for direct-seeding.

Analysis of seedling establishment, plant and crop growth characteristics, lodging resistance, and yield components.

B. Improvement of land preparation for better crop establishment.

Improvement of labor-saving land preparation and seeding methods for crop establishment and weed control.

C. Development of direct-seeding cultivation for increased yield.

Development of high-yielding and labor-saving wet direct seeding cultivation techniques considering land preparation, seeding rate, and fertilizer and water management.

4-3-2. To improve fertilizer application techniques for higher yielding and better quality rice.

A. Improvement of nutrient use efficiency.

Improvement of soil fertility condition and nutrient use efficiency through the combined use of organic and inorganic fertilizers.

4-3-3. To improve techniques for disease and insect pest management.

A. Synthesis and utilization of nationwide historical data on insect pest incidence in the development of location-specific insect pest profiles.

Generation of database on nationwide insect pest incidence and development of location-specific insect pest profiles.

B. Development of standard techniques to determine the mechanisms of resistance of rice cultivars to rice blast disease.

Determination of physiological, morphological, and cytological mechanisms of resistance of rice varieties to rice blast disease.

4-4. Rice Chemistry and Food Science

4-4-1. To improve techniques for rice grain quality evaluation.

A. Highly efficient measurement of moisture and nutrient contents of rice grain by Near-Infrared Reflectance (NIR).

Improvement of NIR techniques for fast and accurate measurement of moisture, amylose, protein, and lipid contents.

B. Establishment of criteria for predicting processing qualities of rice.

Establishment of criteria suitable for evaluating rice grain quality for product processing.

4-5. Farm Management and Technology Transfer

4-5-1. To develop models of mechanized rice-based farm management.

A. Development of farm management models for evaluating mechanized rice-based farming systems.

Development of farm models to evaluate mechanized rice-based farming systems in terms of management, economy, and technical efficiency.

B. Development of techniques for monitoring and evaluation of rice based farming systems using Geographic Information System (GIS) technology.

Development of a PC-based GIS in monitoring and evaluation of rice-based farming systems at the village level.

4-5-2. To develop an information system for rice and rice-based farming technologies.

A. Development of database for better transfer of rice technology information.

Development of a multi-media database of rice technologies developed by PhilRice and the national rice research and development network for better transfer of information nationwide.

5. Project Design Matrix (PDM)

The Team and the Philippine side modified the PDM through their discussions as shown in the Annex II. Particularly, indicators and assumptions were well examined.

6. Project management

The Team and the Philippine side confirmed that to make the implementation of the project activities smooth, both sides will continuously exert their best efforts.

Annex I Tentative Schedule of Implementation

Item	Year of implementation				
	1	2	3	4	5
1.Development of high yielding and better quality rice varieties which are suitable for mechanization.					
1-1.Development of high-yielding varieties and better quality promising lines for mechanized farming in irrigated lowlands.					
a.Development of high-yielding and better quality lines with less shattering and lodging resistance.					
b.Development of high-yielding and better quality lines for direct seeding cultivation.					
1-2.Development of cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas.					
a.Development of high-yielding lines with strong cool-temperature tolerance.					
b.Development of high-yielding lines with cool-temperature tolerance and good grain quality.					
1-3.Evaluation of local adaptability of promising lines.					
a.Evaluation of promising lines in the NCT and other local adaptability tests.					
2.Development of farm machinery for small-scale rice farmers.					
2-1.Development of machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition.					
a.Development of land preparation equipment for direct seeding.					
b.Improvement of performance of hand tractor mounted seeder.					
c.Development of direct seeding equipment.					

Item	Year of implementation				
	1	2	3	4	5
2-2.Development of rice harvesting machinery for small-scale farmers:					
a.Improvement of reaper models.	—	—			
b.Development of crop gathering equipment.		—	—	—	—
c.Development of small combine harvesters for rice.		—	—	—	—
3.Improvement of cultivation techniques for labor-saving and high yielding rice production.					
3-1.Development of techniques for direct-seeding cultivation.					
a.Search for the ideal plant type for direct-seeding.	—	—	—	—	—
b.Improvement of land preparation for better crop establishment.	—	—	—	—	—
c.Development of direct-seeding cultivation for increased yield.	—	—	—	—	—
3-2.Improvement of fertilizer application techniques for higher yielding and better quality rice.					
a.Improvement of nutrient use efficiency.		- -	- -	- -	- -
3-3.Improvement of techniques for disease and insect pest management.					
a.Synthesis and utilization of nationwide historical data on insect pest incidence in the development of location-specific insect pest profiles.		- -	- -	- -	- -
b.Development of standard techniques to determine the mechanisms of resistance of rice cultivars to rice blast disease.		- -	- -	- -	- -

Item	Year of implementation				
	1	2	3	4	5
4.Improvement of rice quality evaluation techniques.					
4-1. Improvement of techniques for rice grain quality evaluation.					
a.Highly efficient measurement of moisture and nutrient contents of rice grain by Near-Infrared Reflectance (NIR).		----	----	----	----
b.Establishment of criteria for predicting processing qualities of rice.		----	----	----	----
5.Development of mechanized rice-based farm management system.					
5-1. Development of models of mechanized rice-based farm management.					
a.Development of farm management models for evaluating mechanized rice-based farming system.		----	----	----	----
b.Development of techniques for monitoring and evaluation of rice-based farming systems using Geographic Information System (GIS) technology.		----	----	----	----
5-2.Development of an information system for rice and rice-based farming technologies.					
a.Development of database for better transfer of rice technology information.		----	----	----	----

----when necessity arises

Annex II PROJECT DESIGN MATRIX (PDM) FOR RESEARCH AND DEVELOPMENT PROJECT ON HIGH PRODUCTIVITY RICE TECHNOLOGY

Cooperation term:August 1,1997 - July 31, 2002 Implementing organization: PhilRice, Department of Agriculture
Drafted by the Consultation Team and PhilRice Team Target group: Small-scale rice farmers

NARRATIVE SUMMARY	OBJECTIVELY VERIFIABLE INDICATORS	MEANS OF VERIFICATION	IMPORTANT ASSUMPTIONS
Overall goal High quality rice is supplied in sufficient quantity and farm management is stabilized through high productivity rice technologies which are sustainable for the conditions in rice growing areas.	· Stabilization of self-sufficiency in rice production · Improvement of farm management	Rice Statistics	Agricultural policies will not drastically change.
Specific Objective High productivity rice technologies for small-scale rice farmers are developed through the project implementation by the Philippine Rice Research Institute.	· Improvement of productivity through high yield and better grain quality	Farm management survey by PhilRice	Small-scale farmers adopt the technology developed by PhilRice.
Outputs of the Project 1) High-yielding and better quality rice varieties which are suitable for mechanization are developed. 2) Farm machinery for small-scale rice farmers are developed. 3) Cultivation techniques for labor-saving and high-yielding rice production are improved. 4) Rice quality evaluation techniques are improved. 5) Mechanized rice-based farm management systems are developed.	1) Twenty promising lines are developed 2) Four prototype machinery are developed 3) Labor-saving of 25% in transplanted and 40% in direct-seeded rice; 10% yield increase 4) Faster rice grain quality evaluation techniques (200 samples/day) are developed 5) Two times faster evaluation and delivery of developed technologies are achieved	1) Commercial varieties 2) Prototypes 3) Cultivation techniques 4) Evaluation techniques 5) Adoption survey	Research activities and PhilRice commitment to the project will be maintained.
Activities of the Project	**Inputs**		PhilRice will continue to conduct high quality research.
1-1) To develop high-yielding and better quality promising lines for mechanized farming in irrigated lowlands. 1-2) To develop cool-temperature tolerant and high-yielding promising lines with good grain quality suitable for cool-elevated areas. 1-3) To evaluate local adaptability of promising lines. 2-1) To develop machinery for plowing, leveling, and seeding for direct-seeding rice cultivation under irrigated lowland paddy condition. 2-2) To develop rice harvesting machinery for small-scale farmers. 3-1) To develop techniques for direct-seeding cultivation. 3-2) To improve fertilizer application techniques for high-yielding and better quality rice. 3-3) To improve techniques for disease and insect pest management. 4-1) To improve techniques for rice grain quality evaluation. 5-1) To develop models of mechanized rice-based farm management. 5-2) To develop an information system for rice and rice-based farming technologies.	(Japanese side) 1. Dispatch of Experts (1)Long-term 1.Team Leader 2.Coordinator 3.Varietal Improvement 4.Farm Mechanization 5.Agronomy (2)Short-term (as needed) 2. Provision of machinery and equipment 3.Acceptance of Philippine counterpart personnel for training in Japan	(Philippine side) 1. Counterpart and administrative personnel 2. Land, buildings and facility 3. Repair or replacement of machinery 4. Maintenance and operating expenses	**PRE-CONDITION** PhilRice will continue as an established rice research center in the Philippines.

Japanese Experts and their Filipino Counterparts in the Technical Cooperation Project

Japanese Experts and Their Filipino Counterparts in the Technical Cooperation Project

FIELD OF EXPERTISE	JAPANESE EXPERT	FILIPINO COUNTERPARTS
A. Long-term		
Management	Dr. Hitoshi Takahashi	Dr. Santiago R. Obien Executive Director Dr. Leocadio S. Sebastian Deputy Executive Director for R&D Mr. Ronilo A. Beronio Deputy Executive Director for Administration
Coordination	Mr. Takanobu Nawashiro	Ms. Teodora L. Briones Development Management Officer III , Planning & Collab. Programs Office (PCPO)
Varietal Improvement	Mr. Takehiko Sasaki	Mr. Hilario C. dela Cruz, Jr. Chief Science Research Specialist (SRS), Plant Breeding and Biotechnology Division (PBBD) Dr. Rodante E. Tabien Chief SRS, PBBD Ms. Thelma F. Padolina Supervising SRS, PBBD Ms. Emily R. Corpuz Senior SRS, PBBD Mr. Jonathan M. Niones SRS, PBBD
Farm Mechanization	Engr. Shuji Ishihara	Engr. Ricardo F. Orge Senior SRS, Rice Engineering and Mechanization Division (REMD) Engr. Eulito U. Bautista Chief Science Res. Specialist, REMD Engr. Caesar Joventino M. Tado Supervising SRS, REMD Engr. Manuel Jose C. Regalado Supervising SRS, REMD
Agronomy	Mr. Shoji Furuya	Ms. Evelyn F. Javier Senior Science Research Specialist (SRS), Soils and Plant Physiology Division (ASPPD) Mr. Fernando D. Garcia Science Research Specialist II, ASPPD Mr. Wilfredo B. Collado Senior SRS, ASPPD

FIELD OF EXPERTISE	JAPANESE EXPERT	FILIPINO COUNTERPARTS
B. Short-term		
Farm Mechanization (Rice Reaper)	Engr. Kunihiko Maeoka	Engr. Manuel Jose C. Regalado Supervising SRS REMD Engr. Eulito U. Bautista Chief Sci. Research Specialist, REMD Engr. Arnold S. Juliano Science Research Analyst, REMD
Farm Mechanization (Rice Reaper)	Mr. Koji Inooku	Engr. Rizaldo E. Aldas Senior SRS REMD Engr. Arnold S. Juliano Science Research Analyst, REMD
Farm Mechanization (Paddy Seeder)	Dr. Ryuji Otani	Engr. Joselito A. Damian SRS, REMD Engr. Ricardo F. Orge Senior SRS, REMD Engr. Eden C. Gagelonia Senior SRS, REMD
Agronomy	Mr. Shoji Furuya	Dr. Rolando T. Cruz Chief SRS, ASPPD Dr. Teodula M. Corton Chief Science Research Specialist, ASPPD Mr. Fernando D. Garcia SRS, ASPPD Ms. Evelyn F. Javier Senior SRS, ASPPD
Weed Science	Mr. Yoshiaki Kawana	Ms. Madonna C. Casimero Supervising SRS, ASPPD Ms. Evelyn F. Javier Senior SRS, ASPPD
Soil Chemistry	Mr. Shigeru Takahashi	Dr. Teodula M. Corton Chief Science Research Specialist, ASPPD Ms. Myrna U. Malabayabas Sr. Science Research Specialist, ASPPD Mr. Jovino L. de Dios Sr. Science Research Specialist, ASPPD

FIELD OF EXPERTISE	JAPANESE EXPERT	FILIPINO COUNTERPARTS
Soils and Fertilizers	Mr. Nizuhiko Nishida	Dr. Teodula M. Corton Chief SRS, ASPPD Ms. Myrna U. Malabayabas Senior SRS, ASPPD Mr. Jovino L. de Dios Senior SRS, ASPPD
Entomology	Dr. Shingo Oya	Dr. Alejandra B. Estoy Supervising SRS, Crop Protection Division (CPD) Ms. Lina B. Flor Senior SRS, CPD
Food Science	Dr. Tetsuo Sato	Mr. James A. Patindol Supervising SRS, Rice Chemistry and Food Science (RCFSD) Ms. Juma Novie A. Ayap Sr. Science Research Specialist, RCFSD Ms. Nanette V. Zulueta Sr. Science Research Specialist, RCFSD
Food Science	Mr. Hiroshi Okadome	Ms. Marissa V. Romero Senior SRS, RCFSD Ms. Juma Novie A. Ayap Sr. Science Research Specialist, RCFSD Ms. Nanette V. Zulueta Sr. Science Research Specialist, RCFSD
Farm Management	Mr. Jinzo Saito	Dr. Sergio R. Francisco Chief SRS, Socio-Economics Division (SED) Ms. Girlie Nora A. Abrigo Senior SRS, SED Ms. Alice M. Briones Senior SRS , SED Ms. Cheryll B. Casiwan Senior SRS , SED
Information Systems	Mr. Tarayuki Aihara	Mr. Roger F. Barroga Information Tech Officer III, Management Information Systems Division (MISD) Ms. Karen Eloisa T. Barroga Senior SRS, Communication Division Mr. Carlo G. Dacumos Computer Operator, Comm. Division Ms. Consolacion D. Domingo Information Systems Analyst, MISD

Facilities, Equipment and Supplies under the Technical Cooperation Project

THE JICA PROJECT-TYPE TECHNICAL COOPERATION ON "RESEARCH AND DEVELOPMENT PROJECT ON HIGH PRODUCTIVITY RICE TECHNOLOGY". *LIST OF FACILITIES, EQUIPMENT AND MATERIALS, FY 1997-1999.*

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
I. FY 1997						
A. Locally Purchased						
1.1	Microscope lamp, 6630-H09, Leica general purpose, valuable for stereomicroscopy, wide aperture with heat-reflecting coating, 3-link arm, ventilated housing includes 6V halogen-cycle lamp, 3-wire and plug for 120V, 50 or 60 Hz	2	42,780	85,560	June 23, 1998	PBBD
	with Lamp Bulb, 6630-H24, 20W	2 (pk of 10)	16,760	33,520	June 23, 1998	PBBD
1.2	CO_2 Injector System for LI-COR LI-6400 photosynthesis analyzer, LI-6400-01 with CO_2 source assembly, CO_2 controller; and 3 packs (25/packs) 12 g CO_2 cylinders	1	268,290	268,290	June 23, 1998	ASD
1.3	Leaf Area Meter LI-3100, LI-COR, laboratory model, includes both 0.1 and 1.0 mm^2 resolution, interface connection for 3000A-01 & dust cover with: - 3100 fluorescent lamps (2 pcs) - 3100 lower & upper transparent belts (1 unit each)	1	544,500	544,500	July 9, 1998	ASD
	- 3100 TBL lower transparent belt	4	2,904	11,616	July 9, 1998	ASD
	- 3100 TBU upper transparent belt	4	2,904	11,616	July 9, 1998	ASD
1.4	Desktop Computer, Compaq DeskPro 2000, 5200 MMX, M2100/Intel Pentium 200 MMX processor, 128 MB RAM, 1.44 MB floppy drive	1	76,370	76,370	March 26, 1998	SSPR
	- COMPAQ 21" color monitor	1	81,330	81,330	March 26, 1998	SSPR
1.5	Printer/Plotter, HP DesignJet 750 C plus color Inkjet printer, 72 MB RAM (to be used for mapping of rice varieties, insect pests & diseases, soil fertility, production, technologies, etc)	1	327,300	327,300	March 26, 1998	SSPR

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
1.6	Digitizer, CALCOMP drawing board III, 36"x48"	1	122,000	122,000	May 26, 1998	SSPR
1.7	PC Based GIS Software, ARCView ver 3.0 for Windows 95, CD	1	87,720	87,720	May 18, 1998	SSPR
	- installation & delivery		1,000	1,000	May 18, 1998	SSPR
	- training on Introduction to ARCView 3.0 for 3 days	1 pax	9,000	9,000	June 24, 1998	SSPR
1.8	Computer, note-type, COMPAQ Armada 1510	1	54,950	54,950	Dec. 21, 1997	JICA
1.9	Cabinet, mini-multi purpose, SC-MM	1	6,000	6,000	Jan. 26, 1998	PBBD
1.10	Cabinet, steel, SC-SL	1	7,100	7,100	Jan. 26, 1998	PBBD
1.11	Cabinet, filing, FC-SP	1	5,950	5,950	Jan. 26, 1998	PBBD
1.12	Seed keeping chiller, KORIN KRS-130AF	2	23,800	47,600	Feb. 27, 1998	PBBD
			Sub-total	***1,781,422***		
B. Shipped from Japan						
1.13	UV Transilluminator Workstation with the following:	1	930,857.68	930,858	Oct. 16, 1998	PBBD
	- desktop computer, IBM PC300GL; monitor, ATTIC; keyboard, IBM; and mouse					
	- circuit board, camera controller, ARCHIVE, 120V drawing 135-175					
	- circuit board, display, ARCHIVE, drawing 135-176					
	- circuit board, VFD4					
	- PCI frame grabber/video card					
	- printer, SONY digital graphic printer UP-D890					
	- convertible transilluminator, FOTODYNE, 220V					
	- UV clear, removable eclipse, slide					
	- CCD camera, 75CE for VII eclipse with mounting bracket, Foto/Analyst					
	- CCTV lens, 48mm, Foto/Eclipse w/ XC75 version II eclipse					
	- Foto/Analyst investigator, 220V Ver II Eclipse, FOTODYNE					
	- Foto/Analyst Foto/Eclipse benchtop darkroom FOTODYNE					
	- filter, interference, fluor grn					

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
	- filter, Ethidium bromide 60-2030, eclipse Ver II					
	- filter, COOMASSIE blue 60-2031, eclipse Ver II					
	- software, PC Image CD ROM only					
	- software, GELPRO 3.0 for Windows					
	- cables and manuals					
1.14	Nitrogen Analyzer, QDS-12M, Mitamura Riken Kogyo, AC220V with the following:	1 lot	764,621	764,621	Mar. 23, 1999	ASD
	- digestion controller, MRK					
	- AVR stavol, Matsunaga, Model SVC 22364					
	- digestion tube rack with 12 holes					
	- vapor still, Kjeldahl-Auto DS-4S					
	- automatic buret, Model APB-410 and accessories					
	- diaphragm vacuum pump MZ-2C					
	- tubes and other accessories					
1.15	Spot Welder DAIDO, SN-31137 with accessory and consumables, manual	1	128,719	128,719	Oct. 16, 1998	REM
1.16	Cone Penetrometer, SPAD DIK-5520 with spare parts, consumables, case (color: orange) and manual	1	91,045	91,045	Oct. 16, 1998	REM
1.17	Floor Stand with 2 pcs middle board (color: avocado green)	1	12,558	12,558	Oct. 16, 1998	REM
1.18	Electronic force balance with tray, AND HP-22K, SN-13007223	1	20,721	20,721	Oct. 16, 1998	REM
1.19	Electronic force balance (SN-D421301817) with tray and adaptor (SN-017390), SHIMADZU BL-220H	1	51,488	51,488	Oct. 16, 1998	REM
1.20	Swing rotor HITACHI, P28S-999, Part No. 9022800 swing bucket rotor, 6x40 ml., 28,000 rpm for Himac SCP 85 H2 Ultracentrifuge with: balance H050, bucket stand, bucket tubes (6 pcs), centrifuge tubes 40PA (150 pcs) and manual	1	587,084	587,084	Oct. 16, 1998	CPD

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
1.21	Centrifuge, TOMY Seiko MX-160 with rotor TMA-24 (1 pc); tube holder (24 pcs); microcentrifuge tubes 2.2 ml (500 pcs), 1.5 ml (500 pcs), 0.75 ml (100 pcs); lock; fuse; allen wrench; fix crew; and manual	1	257,438	257,438	Oct. 16, 1998	CPD
1.22	Sonic Sifter Separator, SEISHIN L-200P with fine collector holder, circuit board (spare), transformer (Toyuzumi, 500 W), cord, brush, spatula, stainless steel sieves 38, 75 and 150 microns and manual	1	882,196	882,196	Oct. 16, 1998	CPD
1.23	Vacuum pump, MILLIPORE CP8 DM-3836 with 50 m tygon tubing RE3603, transformer SE600 Maruman and manual	1	50,232	50,232	Oct. 16, 1998	CPD
1.24	Low temperature incubator HITACHI CR-32C, SN-289984; temp. range: -10 to 50°C; sensitivity: ±0.2°C; 100 VAC with transformer, keys, extra tray and manual	1	138,137	138,137	Oct. 16, 1998	CPD
1.25	Thermal Cycler, BIORAD Gene Cycler 170-6701, 200 V with cord and manual	1	116,161	116,161	Oct. 16, 1998	CPD
1.26	Roller mill, BRABENDER Quadrumat Junior with 70 mesh sieve (34 pcs); transformer BRABENDER with cord; cleaning brush (5 pcs), paint/flat brush 16"; and allen wrench (1 set-10 pcs)	1	1,158,471	1,158,471	Oct. 16, 1998	RCFS
1.27	Multi-media LCD Projector, EIKI LC-6200, SN-07401119 with case, cables VGA & MAC II, screen #032274, cover, remote control, and manual	1	222,903	222,903	Oct. 16, 1998	TPD
1.28	Multi-media LCD Projector, EIKI LC-4300, SN-G7401700 with case, cables VGA & MAC II, screen #032283, cover, remote control, and manual	1	131,859	131,859	Oct. 16, 1998	PCPO
1.29	Cutting Plotter, MIMAKI Pro Series Model CG-61 Type E-2IIC, SN-72807898 with accessories	1	109,882	109,882	Oct. 16, 1998	TPD
1.30	Color scanner for film and print, SHARP JX-350, SN-85105575, 600 dpi with cord and film scanner SHARP JX-35F6, SN-8C100466, adaptor WINSTAR NF-100, 100 W UK reg#2043635	1	39,244	39,244	Oct. 16, 1998	PCPO

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
1.31	Milling machine, universal type, Model" TK-US3N-LH with layout table and spare parts	1	2,933,361	2,933,361	Apr. 21, 1999	REM
1.32	Slotter machine, Model MY-160S with slotter chuck, round bites of different sizes and spare parts	1	718,689	718,689	Apr. 21, 1999	REM
1.33	Foot shearing machine, Model: A4-620 with spare parts	1	1,593,868	1,593,868	Apr. 21, 1999	REM
1.34	Bending roll machine, Model: 6 type 2000-3.2 with splashes of mud apparatus and spare parts	1	672,966	672,966	Apr. 21, 1999	REM
1.35	TIG ARC welding machine, Model: 500P with standard and special accessories, and spare parts:	1	408,288	408,288	Apr. 21, 1999	REM
	- power supply for welder, AVP-500					
	- Welding torch, AW-18					
	- Cable hose, BMRH-500H					
	- Gas flow regulator, AR-2F					
	- Remote controller, K5042B					
	- Cable, 6m					
	- Welding bar steel, 2.44mm, 3.2 mm					
	- Cool water circulation, PU-301					
	- spare parts					
1.36	Press brake, model APM-8020	1	1,693,686	1,693,686	Apr. 21, 1999	REM
	- metal patterns (lower and upper)					
	- holder, IVDH					
	- spare parts					
1.37	Electric dynamometer, Model DWE-7/20-P and spare parts	1	2,337,673	2,337,673	Apr. 21, 1999	REM
1.38	Flow meter, Model: FP-2140H with signal cable 5m FP-011 and spare parts	1	214,448	214,448	Apr. 21, 1999	REM
1.39	Indicator, Model: DF-2410	1	137,491	137,491	Apr. 21, 1999	REM
1.40	Mini-elf, Mitsubishi "cargo truck double cabin" and accessories	1	1,401,921	1,401,921	Oct. 9, 1998	Research
1.41	Light truck, Mitsubishi Pajero, high roof wagon and accessories	1	755,818	755,818	Oct. 9, 1998	Research

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
1.42	Books, 14 volumes	1 lot	58,516	58,516	Aug. 19, 1998	Library
1.43	Journals	1 lot	1,279,753	1,279,753	(estimate)	Library
			Sub-total	***19,900,093***		
C. Brought by Experts						
1.44	Balance, electric with adaptor, SB 800	1	32,662.58	32,663	Aug. 30, 1997	PBBD/T. Sasaki
1.45	Balance, electric with adaptor, PB 5001	1	27,413.24	27,413	Aug. 30, 1997	PBBD/T. Sasaki
1.46	Balance, auto-B-type	1	16,214.64	16,215	Aug. 30, 1997	PBBD/T. Sasaki
1.47	Dish, grain quality testing, S-100B	300	74.07	22,222	Aug. 30, 1997	PBBD/T. Sasaki
1.48	Meter, grain moisture, PM-700	1	37,095.36	37,095	Aug. 30, 1997	PBBD/T. Sasaki
1.50	Recorder, portable, WR 7400	1	87,489.06	87,489	Oct. 23, 1997	REM/K. Maeoka
1.51	Computer, desktop, COMPAQ Presario 4190	1	83,610.38	83,610	Nov. 14, 1997	JICA/T. Nawashiro
1.52	Software, MS Office 97 ST (Japanese)	1	14,144.07	14,144	Nov. 14, 1997	JICA/T. Nawashiro
1.53	Printer, color BJ 455J with adaptor, cable and ink cartridge	1	43,753.28	43,753	Nov. 14, 1997	JICA/T. Nawashiro
1.54	Transformer, SVC-1000ND	1	7,144.94	7,145	Nov. 14, 1997	JICA/T. Nawashiro
1.55	Dictionary	1	4,433.65	4,434	Nov. 14, 1997	JICA/T. Nawashiro
1.56	Computer, Power Macintosh 7600/200 with monitor, keyboard, modem and interface cable	1	112,131.82	112,132	Jan. 12, `1998	REM/S. Ishihara
1.57	Printer, Color, LaserJet 6L	1	17,468.65	17,469	Jan. 12, `1998	REM/S. Ishihara
1.58	Scanner, JX-250 M3	1	11,023.62	11,024	Jan. 12, `1998	REM/S. Ishihara
1.59	Transformer, SVC-1000ND	1	6,707.49	6,707	Jan. 12, `1998	REM/S. Ishihara
1.50	Software, MS Office Ver 4.2	1	14,523.18	14,523	Jan. 12, `1998	REM/S. Ishihara
1.61	Software, Excel	1	8,748.91	8,749	Jan. 12, `1998	REM/S. Ishihara
1.62	Video camera, digital DCR-PC10 SONY and accessories	1	70,399.53	70,400	Feb. 5, 1998	REM/R. Otani
1.63	Chapter board, DVBK-W2000 SONY	1	14,873.14	14,873	Feb. 5, 1998	REM/R. Otani
1.64	Thermo-hygrometer, Quartz 3-3121 ISUZU with cartridge pen	4	18,664.33	74,657	Mar. 10, 1998	ASD/S. Furuya
			Sub-total	***706,717***		
			TOTAL (FY 1997)	***22,388,232***		

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
II. FY 1998						
A. Locally Purchased						
2.1	Cold tolerance testing device (design and construction)	1 lot	1,450,000	1,450,000	June 30, 1999	PBBD
2.2	Generator, 35 KVA diesel generator set Perkins (USA), 27KW, 3-phase, 220V60Hz, 1800 rpm, driven by a radiator cooled Perkins diesel engine model 3.1524, 3-cylinders in line type coupled to a brushless alternator and installation	1 set	400,000	400,000	June 30, 1999	PBBD
2.3	Pump, Service Submersible sewage pump, 300 LPM x 7m TDH EBARRA Brand Model 50DL6.75S	1	34,000	34,000	June 30, 1999	PBBD
2.4	Computer, HP Brio PC Intel Pentium II-333 MHz	1	77,500	77,500	March 8, 1999	PBBD
2.5	Inkjet Printer, HP Deskject 890C	1	17,500	17,500	March 8, 1999	PBBD
2.6	Refrigerator, SANYO 28-OD, 2-door, 8 cu. ft.	1	14,000	14,000	March 8, 1999	PBBD
2.7	Incubator, programmable, illuminated, -10 to 50°C, temperature range: ±0.2°C sensitivity, 220VAC. 348 lbs, Cole Parmer 95-96/Cat. No. H-39350-15	1	493,700	493,700		PBBD
2.8	Showcase refrigerator, CHEE PUCK, with 3-door, adjustable sheet shelves, cooling system air-cooled defrost circulation, 182Wx79Dx206H cm, 60 cu. ft. capacity, 220V 60 cycle	1	137,000	137,000	March 29, 1999	RCFS
2.9	Network printer, HP Laserjet 4V	1	71,000	71,000	March 8, 1999	PCPO
2.10	Tape Recorder, SONY TCM 353	5	1,650	8,250	March 8, 1999	SED
2.11	RISOgraph Digital Duplicator GR3770, Super digital printer with digital scanner, 600 dpi resolution, 60-120 copies per minute (plus delivery)	1	374,500	374,500	March 4, 1999	TPD
	- color drum (green and yellow)	2	37,000	74,000		
2.12	Computer parts, motherboard & hard disk for COMPAQ Presario 4190	1	43,184	43,184	June 29, 1998	JICA
2.13	Zip drive, Iomega , RAMJ27B3VW	1	7,000	7,000	Sept. 5, 1998	REM
2.14	Modulator, PX SA-65	1	7,800	7,800	Dec. 15, 1998	JICA
2.15	Note-type computer, IBM Think Pad 310-CD and printer	1	80,280	80,280	Feb. 7, 1999	REM
2.16	Seed keeping Chiller, KORIN KRS-130AF	2	23,310	46,620	Feb. 7, 1999	PBBD

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
2.17	Digitizer stand, power lift manual	1	60,000	60,000	Feb. 18, 1999	SED
2.18	Hard disk, Seagate 9.1 GB, SCSI drive	1	23,000	23,000	Feb. 18, 1999	PCPO
2.19	Software, Windows95	1	8,338	8,338	Jan. 25, 1999	REM
2.20	Hi-Lux Double Cab 4x4 TOYOTA, 3L straight diesel engine 2800 cc, 4 cylinder in-line, OHC 8 valves & 5-speed manual transmission, power steering, power windows, power door locks, front suspension	1	858,000	858,000	March 4, 1999	PPD
2.21	Hi-Ace Commuter Van, 2L straight diesel engine 2446 cc, 4 cylinder in-line, OHC 8 valves & 5-speed manual transmission	1	609,000	609,000	March 4, 1999	PPD
			Sub-total	*4,894,672*		
B. Shipped from Japan						
2.22	Temperature Cycler, Robocycler, Strategene Cat. No. 400982 with: 96, and 40 well interchageable blocks; hot top assembly	1	851,608	851,608	Feb. 3, 2000	PBBD
2.23	Power supply, Power Pac3000 electrophoresis, BIORAD with: power output: 1-400 watts; current output: 1-400 milli amperes; temperature probe adopter	1	112,548	112,548	Feb. 3, 2000	PBBD
2.24	Nucleic acid eletrophoresis cell system, BIORAD Sequi-Gen GT with accessories: 4 extra outer glass plates, 1 syringe-140 cc, vinyl spacers and comb, extra caster base, 2 caster gasket	2	49,870	99,740	Feb. 3, 2000	PBBD
2.25.	Centrifuge, high speed Himac CF15R Hitachi, max. speed 15,000 rpm with angle rotor T15A23, swing rotor T15S21, and bucket	1	410,611	410,611	Feb. 3, 2000	PBBD
2.26	Mini-vertical electrophoresis system, P28551-00	1	19,076	19,076	Feb. 3, 2000	PBBD
2.27	Sampling thresher, R-7	2	119,225	238,450	Feb. 3, 2000	PBBD
2.28	Seed counter, Waver Model IC-1, Index Co. with turn table	2	374,707	749,415	Feb. 3, 2000	PBBD
2.29	Altimeter, No. 3263 Sato Keiryoki	1	6,132	6,132	Feb. 3, 2000	PBBD

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
2.30	Clean bench, Hitachi, PCV-1305BNG3, stand height: over 70cm, width: 130cm, depth: 75 cm, right illumination: 40W x over 3	1	300,447	300,447	Feb. 3, 2000	PBBD
2.31	Autoclave, KT-30 LD, Tokyo Thermo Tec, max temp.: 120°C, inner diameter: over 30 cm, depth: 45 cm, plus drainage hose and 3 baskets	1	142,184	142,184	Feb. 3, 2000	PBBD
2.32	Incubator, TDH-120S # 119, temperature and humidity control type, temp. range: water temp. +3~ 40°C, volume: 1000 liter, temp. control system: water cooling	1	572,280	572,280	Feb. 3, 2000	PBBD
2.33	Incubator, CR41LC Hitachi, with transformer SE600 and spare lamps	3	233,681	701,043	Feb. 3, 2000	PBBD, CPD
2.34	Dissolved oxygen meter, MO128-2M with weight for sensor and spare parts	1	71,024	71,024	Feb. 3, 2000	PBBD
2.35	Sterilize drying oven. SP 450 with base	1	78,348	78,348	Feb. 3, 2000	PBBD
2.36	Seed moisture meter,. SP-1D2, Kett Electric	2	29,295	58,591	Feb. 3, 2000	PBBD
2.37	Seed blower, Cat HF-1, Model 757, Fujiwara	2	218,012	436,023	Feb. 3, 2000	PBBD
2.38	Plant canopy image analyzer CI-110, CID, Inc. with system and accessories (laptop computer, softwares, power supply, etc.)	1	347,456	347,456	Feb. 3, 2000	ASD
2.39	Ion meter, Hitachi, C-141(NO3), C-131 (K+), C-122 (Na+) and standard solutions Y026, Y025, Y024	3	8,857	26,570	Feb. 3, 2000	ASD
2.40	Hollow Cathode Lamps for atomic absorption spectrophotometer (AAS) HITACHI, Ca HLA4s, Mg HLA4s, K HLA4s, Zn HLA4s, Fe HLA4s, Cu HLA4s, Mn HLA4s (1 each)	1 set	92,314	92,314	Feb. 3, 2000	ASD
2.41	Computer Image analysis system, CI-400 with personal computer, transformer, digital camera C-830L CA media	1 lot	664,254	664,254	Feb. 3, 2000	ASD
2.42	Partition plate	200 roll	238	47,690	Feb. 3, 2000	ASD
2.43	Platform balance, Ohaus P-01006-42, capacity-200kg; readability-0.1kg; Platform size; 20.5"L x 15.75"W x 2.75"H; 220 VAC, 60 Hz with AC adapter	1	20,439	20,439	Feb. 3, 2000	REM

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
2.45	Soil Moisture measurement unit, CR-10X Campbell Scientific with power supply, rechargeable battery, softwares, etc.	1	113,093	113,093	Feb. 3, 2000	REM
2.46	Printer/Plotter, HP DesignJet 750/C Plus, prints in D/A1-size black or color plots in less than 4 minutes	1	352,225	352,225	Feb. 3, 2000	REM
2.47	Ultrasonic thickness gauge, takes non-destructive measurements of most metals and non-metals, Cole Parmer 97-98, Cat. No. E-59785-00	1	68,469	68,469	Feb. 3, 2000	REM
2.48	Portable digital pressure gauge, measures pressure with +- 0.15% accuracy, Cole Parmer 97-98, Cat. No. E-68970-10	1	20,950	20,950	Feb. 3, 2000	REM
2.49	Digital counter, digital counter for batch counting and control, coil winding and wire cutting, Cole Parmer 97-98, Cat. No. E-08614-30	1	6,813	6,813	Feb. 3, 2000	REM
2.50	Eppendorf Reference Pipettor w/ tip-rack, Adjustable-volume pipettors, E-24505-60 with 100-1000μl volume, fixed and adjustable-volume pipettors with 1000μl volume	2	13,966	27,933	Feb. 3, 2000	CPD
2.51	Eppendorf Reference Pipettor w/ tip-rack, positive displacement pipettor, E-24551-00, 1 to 20μl, pipettor tips, E-24551-50, 1 to 20μl	2	16,351	32,702	Feb. 3, 2000	CPD
2.52	Stereomicroscope, Meiji P-48402-00, 7 to 45 x magnification compatible with photo systems with replacement bulb, P-48402-50	1	70,683	70,683	Feb. 3, 2000	CPD
2.53	Microscope, Olympos BX40F4 with photographic system, Camera PM-C35DX	1	312,540	312,540	Feb. 3, 2000	CPD
2.54	Rice sample tester for milling, McGill No. 3 Miller, No. 3M/C with 3 HP motor, standard wiring, 220 V, 60Hz, complete with automatic timer and starter	1	367,894	367,894	Feb. 3, 2000	RCFS
2.55	Grain shape tester, Model MK-100, Kett Electric	1	6,813	6,813	Feb. 3, 2000	RCFS

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
2.56	Electrophoresis kit with mini electrophoresis cell, power supply and accessories, Vertical electrophoresis cell (P-28551-00); standard power supply (P-28401-05), Cole Parmer 97-98	1	61,316	61,316	Feb. 3, 2000	RCFS
2.57	CamCorder, SONY, UVM-100BF with video deck, color monitor, tripod & other accessories	1	1,027,379	1,027,379	Feb. 3, 2000	TPD
2.58	Video scan Converter, SCAN DO Ultra; converts computer graphics to video; up to 1600 x 1280 pixel input; analog output/NTSC, PAL, S-video, CAV; flicker filter; autosync	1	241,857	241,857	Feb. 3, 2000	TPD
2.59	Camera back for Polaroid Dgital Palette CI 5000S, Camera back for 35 mm slides for digital palette color film recorder	1	26,570	26,570	Feb. 3, 2000	PCPO
			Sub-total	***8,783,480***		
C. Brought by Experts						
2.60	Plasma cutter, FB-50 McMaster	1	132,409	132,409	May 8, 1998	REM/H. Takahashi
2.61	Vacuum cleaner, JE-520 JET	1	69,357	69,357	May 8, 1998	REM/H. Takahashi
2.62	Rice Grain inspect, KETT	1	599	599	May 8, 1998	REM/H. Takahashi
2.63	Strain gage, DPM-601A KYOWA	1	53,279	53,279	May 8, 1998	REM/H. Takahashi
2.64	Note type computer and mouse, PC-LV16CWSDAF1 NEC	1	120,113	120,113	May 8, 1998	ASD/S. Furuya
2.65	Printer and accessory, BJC-80V CANON	1	18,033	18,033	May 8, 1998	ASD/S. Furuya
2.66	Soil Hardness tester, Fujihara	1	17,339	17,339	June 8, 1998	ASD/H. Takahashi
2.67	Logging meter, DIK-7400	2	17,654	35,309	June 8, 1998	ASD/H. Takahashi
2.68	Gravity meter	1	12,610	12,610	June 8, 1998	ASD/H. Takahashi
2.69	Gas rice cocker, PR-100 DF	10	4,224	42,245	June 17, 1998	PBBD/H. Takahashi
2.70	Plate and Adhesives for Insects collection	1	29,319	29,319	Nov. 30, 1998	CPD/S. Oya
2.71	Standard leaf color note, FUJIHARA	1	5,485	5,485	Jan. 13, 1999	ASD/H. Takahashi
2.72	Chrorophyll meter"SPAD-502", MINOLTA	2	31,661	63,323	Jan. 13, 1999	ASD/H. Takahashi
2.73	Rubber Boots, Tsukiboshi	1	1,072	1,072	Jan. 13, 1999	ASD/H. Takahashi
2.74	Pipette, NICHIRYO NP-5000, 1000, 200, 100, 20	5	7,881	39,405	Feb. 24, 1999	RCFS/T. Sato
2.75	Pipette tip and standard chemical, NICHIRYO/SIGMA	1	14,849	14,849	Feb. 24, 1999	RCFS/T. Sato

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
2.76	Strain gage, KYOWA	1	4,035	4,035	March 15, 1999	REM/H. Takahashi
2.77	Bridge box and connection cable, KYOWA	1	8,449	8,449	March 15, 1999	REM/H. Takahashi
2.78	Rubber Boots	12	1,261	15,132	March 15, 1999	PBBD/ASD/
2.79	Scoot meter, YSI 85-10	1	111,917	111,917	March 15, 1999	ASD/Takahashi
2.80	Resistant meter cap gauge, DAIKI 7400/9505A	3	42,245	126,735	March 15, 1999	ASD/Takahashi
2.81	GIS Software, Map Info Professional	1	69,357	69,357	March 15, 1999	SED/J. Saito
2.82	Thermometer, standard, Nihon-Keiryoki, 8387, 8388	2	15,038	30,076	March 29, 1999	PBBD/H. Takahashi
2.83	Thermometer, standard, Nihon-Keiryoki, 9011, 9012	2	7,661	15,322	March 29, 1999	PBBD/H. Takahashi
2.84	Stapler, H-NF, HL-19, HL-16, Sekisui	3		35,151	March 29, 1999	PBBD/H. Takahashi
2.85	Paper cutter, DN31, Kokuyo	1	4,981	4,981	March 29, 1999	PBBD/H. Takahashi
2.86	Electronic punch, PNE150 with transformer, spare blade PNE150A, plate PNE150B	1	37,415	37,415	March 29, 1999	PBBD/H. Takahashi
2.87	Measuring tape, 100m, GR12-1H	2	3,689	7,378	March 29, 1999	PBBD/H. Takahashi
2.88	Measuring tape, 50m, CL-G50	2	1,797	3,594	March 29, 1999	PBBD/H. Takahashi
2.89	Counter	2	3,405	6,810	March 29, 1999	PBBD/H. Takahashi
2.90	Color printer, BJC-F600 Canon	1	20,177	20,177	March 29, 1999	PBBD/H. Takahashi
2.91	Ink cartridge, BC-30 (black), BC31 (color)	25		32,913	March 29, 1999	PBBD/H. Takahashi
2.92	Revolution attachment, RJ05	1	3,247	3,247	April 9, 1999	REM/K. Inooku
2.93	Ball joint, TU12	2	1,166	2,333	April 9, 1999	REM/K. Inooku
2.94	Flying rings, TR05C	1	3,878	3,878	April 9, 1999	REM/K. Inooku
2.95	Hook, TH-05C	1	5,139	5,139	April 9, 1999	REM/K. Inooku
2.96	Infrared REY moisture meter, FD-600	1	46,595	46,595	April 9, 1999	REM/K. Inooku
2.97	Digital video tape, Mini DV60	10	293	2,930	April 9, 1999	REM/K. Inooku
2.98	Spare lamp, 185W/220V	1	946	946	April 9, 1999	REM/K. Inooku
			Sub-total	***1,249,256***		
			TOTAL (FY 1998)	***14,927,408***		

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
III. FY 1999						
A. For local purchase						
3.1	Airconditioner, National, 60 Hz, h hp (29,960 kj/hr)	1 unit	91,180	91,180		
3.2	Portable glass cutter, HONDA UMK431 with mowing unit (blade & disc)	5	15,500	77,500		
3.3	Nursery thresher, large vogel type stationery plot thresher, Seedburo #SLVPT-OS/G	1	1,446,293	1,446,293		
3.4	Water purification system (distilling apparatus), ELGA OSF option 7	1	180,000	180,000		
3.5	Microscope, binocular, Model: AS-BH/Asahi, 4x, 10x, 40x, 100x	1	42,500	42,500		
3.6	Storage cabinet, ZR7-624-Zefil, 1,800x750x800 mm	2	16,000	32,000		
3.7	Work bench, ZRWB-1668-Zefil, 1,500x750x740mm	3	32,000	96,000		
3.8	Scintillation vials, Cole parmer P-08918-62, polyethelyne linerless, 20 ml	2	11,500	23,000		
3.9	Separatory funnel, 3-piece, PYREX, 125 ml	10	2,640	26,400		
3.10	Beaker, NALGENE, polypropylene, 1000 ml	5	855	4,275		
3.11	Volumetric flask, NALGENE, polypropylene, 100 ml	10	674	6,743		
3.12	pH/conductivity meter, Cole Parmer P-190-70-20, waterproof, portable	1	34,295	34,295		
3.13	Electronic balance, Sartorius BP3100S, toploading	1	71,533	71,533		
3.14	Balance printer, Sartorius YDP03-OCE	1	47,231	47,231		
3.15	Industrial balance, A&D HP-40K, 41 kg	1	210,000	210,000		
3.16	Hot plate, Snijder Model 34531E, alluminun alloy hotplate 455x345 mm	1	61,844	61,844		
3.17	Fume hood, YAMATO FHS-150SBZ	1	695,720	695,720		
3.18	Sound measurement monitor, Cole Parmer P-01549-10	1	50,119	50,119		
3.19	Combustion gas analyzer, Cole Parmer P-05500-22, deluxe analyzer with built-in data logger	1	302,772	302,772		
3.20	Digital manometer, Cole Parmer P-10400-25	1	53,238	53,238		

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
3.21	Digital proctractor, Cole Parmer P-972-30-00	1	18,161	18,161		
3.22	Watt meter, Cole Parmer P-26844-00, hand-held	1	15,488	15,488		
3.23	Shaker-incubator, lab-line bench-top , 40-400 rpm	1	303,100	303,100		
3.24	Hot plate stirrer, Corning, PC420, top plate dimension 5"x7"	1	17,000	17,000		
3.25	Culture test tubes and cap	1	31,717	31,717		
3.26	Constant temperature oven, MEMMERT universal oven, Model UM-400	1	52,464	52,464		
3.27	Digital micropipettor, SOCOREX Calibra	3	10,654	31,962		
3.28	Pippetor, 50 ul, 100 ul, 1000 ul with tips and rack	1 lot	13,510	13,510		
3.29	Pippetor, 8-multi channel, adjustable transferpette	1	18,480	18,480		
3.30	Fraction collector, FOXY Jr.	1	298,710	298,710		
3.31	Centrifuge, UNICEN 15DR, HEROLAB	1	644,250	644,250		
3.32	Glossmeter, Cole Parmer P-59600-05, digitral, 3-digit L	1	59,400	59,400		
3.33	Global positioning system, GEOEXPLORER II, trimble	2	218,000	436,000		
3.34	Uninterruptible power supply, APC Smart 3000i	5	57,900	289,500		
3.35	Information switching system, KX-T500, Panasonic digital system, 16 trunks x 150 locals	1	871,694	871,694		
3.36	Software, Adobe priemire 5.1 A version (windows)	1	35,000	35,000		
3.37	Hardisk, Seagate 9.1 GB with controller card (SCSI)	1	22,957	22,957		
3.38	Color printer, HP color laser Jet 4500	1	146,970	146,970		
3.39	Vehicle, KIA Sportage grand wagon 4WD, 2000 model	1	830,000	830,000		
3.40	Weather instruments (temperature, rainfall, relative humidity, sunshine duration, pan evaporation)	5	265,300	1,326,500		Additional budget
3.41	Air conditioning system	1	1,341,500	1,341,500		Additional budget
3.42	Near-Infrared Reflectance, Infratec 1229 Grain analyzer	1	1,702,458	1,702,458		Additional budget
3.44	Electric line for cold tolerance screening facility	1	467,000	467,000		Special budget
3.45	National Rice Engineering & Mechanization Center	1	11,050,000	11,050,000		Special budget
			Sub-total	***23,576,464***		
B. Shipped from Japan			***(estimate)***	***(estimate)***		
3.46	Accessories for milling machine, TAKEDA TK-US3N-LH	1 lot	520,000	520,000		Additional budget

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
3.47	Gtain shattering tester	1		91,425		
3.48	Portable weed cutter	2	-	-		
3.49	Thresher	2	-	-		
3.50	Quadrat sampling slot sieving grader	1	198,613	198,613		
3.51	Digital film printer	1	481,652	481,652		
3.52	Seed counter	2	535,940	1,071,879		
3.53	Nitrogen meter	1		-		
3.54	Environment condition meter	1		-		
3.55	Digital camera	1		-		
3.56	Centrifuge, high-speed	1	180,013	180,013		
3.57	Heating rod	2	27,743	55,485		
3.58	Seal tubes with space caps and racks	10	34,187	341,866		
3.59	Swinging backet rotor for ultra centrifuge	1	467,844	467,844		
3.60	High efficiency particulate filter for clean bench	6	48,550	291,299		
3.61	Digital SLR camera and accessories	1	1,249,559	1,249,559		
3.62	Camcorder	1	127,364	127,364		
3.63	DPS Spark Firewire	1	40,353	40,353		
3.64	Books and journals	1 lot	945,776	945,776		
			Sub-total	***6,063,127***		
C. Brought by Experts						
3.65	Personal computer, DynaBook 4050X CDTA with printer, and other accessories	1 lot	149,489	149,489	November 1999	JICA/H. Takahashi
3.66	Grain moisture balance, MGMT-1	2	37,412	74,824	Feb. 22, 2000	ASD/ Y. Kawana
3.67	Sprayer, BH565B	4	1,379	5,517	Feb. 22, 2000	ASD/ Y. Kawana
3.68	Sprayer, BH568	2	2,254	4,507	Feb. 22, 2000	ASD/ Y. Kawana
3.69	Dry cell, #3	20	25	505	Feb. 22, 2000	ASD/ Y. Kawana
3.70	Dry cell, #1	20	64	1,282	Feb. 22, 2000	ASD/ Y. Kawana
3.71	Micropippette, PG 20, PG200, PG1000 (1 pc each)	1 set	16,317	16,317	Feb. 22, 2000	ASD/ Y. Kawana
3.72	Disposable tip for micropippette	2 bxs	2,409	4,817	Feb. 22, 2000	ASD/ Y. Kawana
3.73	Label	20 pks	200	6,993	Feb. 22, 2000	ASD/ Y. Kawana

ITEM NO.	ITEM/DESCRIPTION	QTY	UNIT COST (in Pesos)	TOTAL COST (in Pesos)	DATE DELIVERED	LOCATION
3.74	Envelope	77 sets	78	5,983	Feb. 22, 2000	ASD/ Y. Kawana
3.75	Wrapping paper	2 packs	233	466	Feb. 22, 2000	ASD/ Y. Kawana
3.76	Book	1	13,319	13,319	Feb. 22, 2000	ASD/ Y. Kawana
3.77	Softwares (SPSS), Zip drive & disk, RAM board, 63 MB, scanner Canon FB630P, tweezers, aluminum cup	1 lot	113,583	113,583	March 2000	RCFS/H. Okadome
3.78	Isotope maker for urea (N^{15})	110 g	97,100	97,100	March 2000	ASD/M. Nishida
3.79	Accessories for AAS	1 lot	22,982	22,982	March 2000	ASD/M. Nishida
3.80	Softwares (Oracle 8i workgroup server for windows NT R8.1.5 (5 users) and additional 2 users	1 lot	84,521	84,521	March 14, 2000	MIS/T. Aibara
3.80	Softwares (Oracle 8i workgroup server for windows NT R8.1.5 (5 users) and additional 2 users	1 lot	59,048	59,048	March 14, 2000	MIS/T. Aibara
			Sub-total	***661,252***		
			TOTAL (FY 1999)	***30,300,843***		

Note: Converstion rate: 1 Peso = 3.429 Yen (FY 1997)
1 Peso=3.172 Yen (FY 1998)
1 Peso=3.172 Yen (FY 1999)

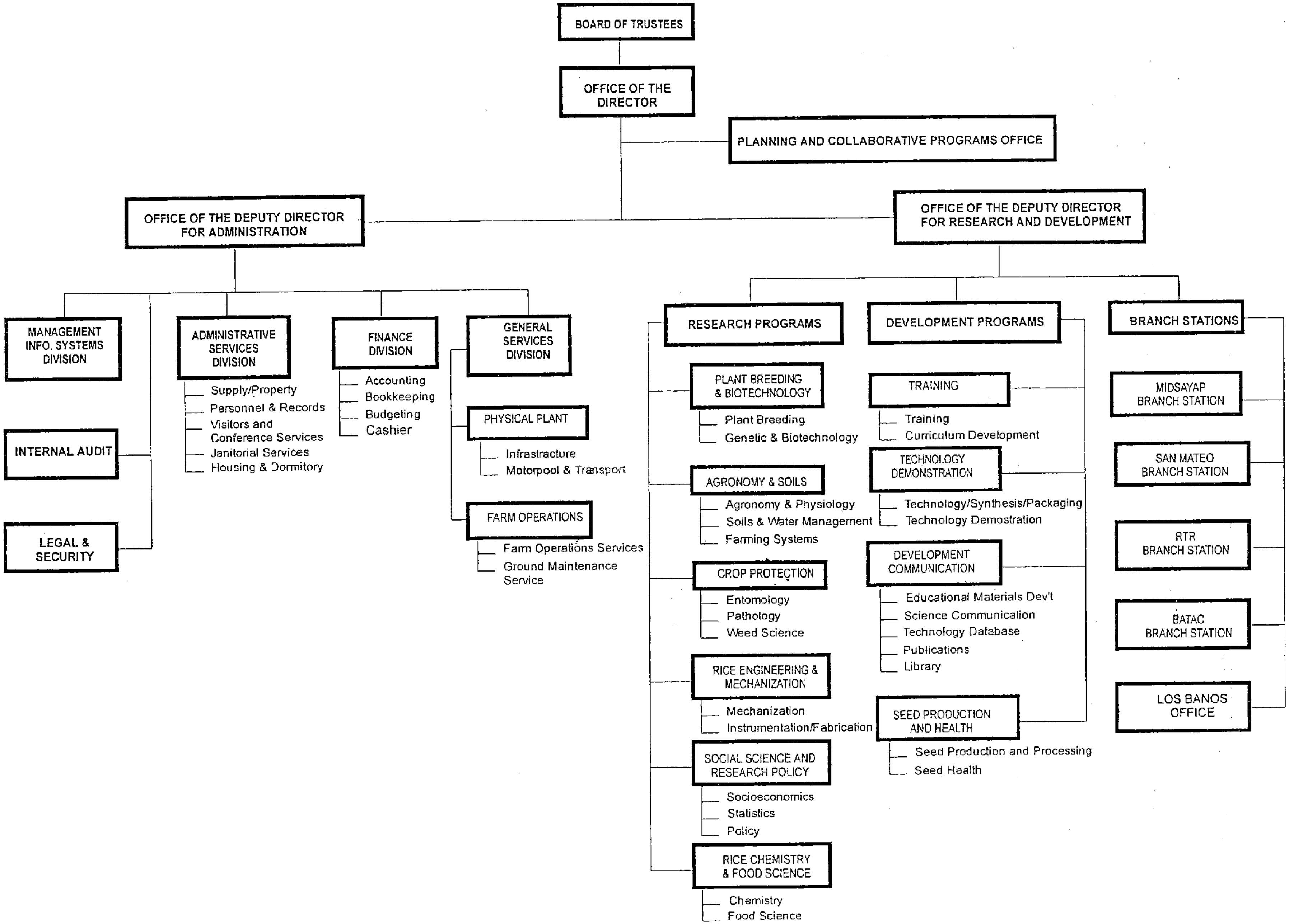
file:teody/jica2/equipt97-99.xls/sheet:equipt

Philippine Rice Research Institute, Corporate Operating Budget, FY 1997-2000.

PARTICULARS	AMOUNT (₱'000)			
	1997	1998	1999	2000 a/
A. General Administration and Support Services	38,649	43,417	48,825	47,189
B. Support to R&D Operations				
1. Seed Production & Health	13,075	7,445	12,787	13,410
2. Farm Operations	4,380	2,212	3,197	3,167
Sub-total	*17,455*	*9,657*	*15,984*	*16,577*
C. R&D Operations				
Research	66,480	63,673	65,737	66,252
Technology Transfer	20,333	11,463	12,677	15,863
Sub-total	*86,813*	*75,136*	*78,414*	*82,115*
Support to the Network	10,000	7,500	6,000	3,500
Rice Research Extension for Mindanao	24,000 b/	10,000	7,500	17,500
Impact Project on High Yield Rice Production for Selected Provinces		7,500	6,000	4,000
Rice Seed Production for Municipalities		2,500	2,000	-
TOTAL	**176,917**	**155,710**	**164,724**	**170,882**

a/ Estimate
b/ Congressional initiative (net of 20 reserve)

PHILIPPINE RICE RESEARCH INSTITUTE ORGANIZATIONAL STRUCTURE



DA-Philippine Rice Research Institute (DA-PhilRice)

DA-PhilRice, an attached agency of the Department of Agriculture (DA), was created through Executive Order No. 1061 on November 5, 1985 to develop and implement a national rice research and development program, sustain the gains made in rice production, and solve location-specific problems of the whole rice industry.

On November 7, 1986, PhilRice's mandate was further strengthened by EO No. 60, empowering it to direct and coordinate rice R&D activities of all agencies working on rice. PhilRice's ultimate objective is to improve the economic condition of the small farmers.

Starting in 1999, DA-PhilRice implements the following programs: (1) direct-seeded irrigated lowland rice (2) transplanted irrigated lowland rice (3) hybrid rice (4) rice for adverse environments, (5) rice-based farming systems (6) rice and rice-based products (7) technology promotion and development and (8) policy research and advocacy. With this new structure, PhilRice aims to solve specific problems in different locations and hopes to sustain the gains it has attained in the past years.

Project-Type Technical Cooperation for DA-PhilRice

On June 22, 1988, the Philippine government requested a grant-in-aid assistance from the Government of Japan through the Japan International Cooperation Agency (JICA). The request was formally granted on December 21, 1989. The grant consisted of a laboratory, dormitory and field service buildings, headhouses, greenhouses, a 2-km drainage canal for the experimental farm, equipment, vehicles, and other facilities for research and training.

To further strengthen the rice R&D programs and manpower capability of PhilRice, a second assistance in the form of a Project-Type Technical Cooperation (T/C) was granted. The T/C started on August 1, 1992 and ended on July 31, 1997.

In May 1997, the governments of Japan and the Philippines agreed to have another project-type T/C entitled "Research and Development Project on High Productivity Rice Technology". Similar to the previous T/C, the project has three components namely: 1) dispatch of Japanese experts who will collaborate with their Filipino counterparts on specific fields; 2) training of Filipino scientists in Japan; and 3) provision of equipment and materials needed in the conduct of rice R&D activities. This project started on August 1, 1997 and will end on July 31, 2002.

PhilRice 12-02
以下10頁

Third Meeting of the Joint Coordination Committee
for the implementation of the JICA Project-Type Technical Cooperation on Research and Development Project on High Productivity Rice Technology
27 March 2000, PhilRice CES, Maligaya, Munoz, Nueva Ecija

MINUTES

Message

Hon. Cristino M. Collado
Undersecretary
Department of Agriculture

(Greetings)

In behalf of Secretary Angara and the top management officials of the Department of Agriculture, please allow me to greet you all this afternoon, especially the members of the Advisory Team who are here today. Please accept our warm welcome. Please allow me to express our deepest appreciation to all members of the technical experts (both the long- and short-term experts), and most especially to the office of the Resident Representative of JICA for their continuing support to our efforts to boost our national productivity in terms of rice production.

As we gather here today, we are about to review the performance of the project for the last two years; what it intends to do this year; and what to expect in the remaining years of the project. I understand this is a five-year project and therefore, we can look forward to three years more of productive collaboration between our teams. Before I go on, allow me to take this opportunity to appreciate JICA for its many contributions to the Department of Agriculture in particular, more particular to PhilRice, and to Philippine agriculture, in general.

We are aware that you have helped us develop our soils research center at the Bureau of Soils and Water Management. We also recognize the nice project going on at APC Bohol which I have seen, and I may say that this is a concrete example of what we can do together; for helping us in detecting pesticide residue at the Bureau of Plant Industry; and developing our manpower through your assistance to the DA-Agricultural Training Institute. In kind, yearly, we have been a fortunate recipient of the generous grant under KR2. This year, we have received the first batch which we hope will enable us to finance our other projects in agriculture. More importantly, you have been helping us in developing our technical manpower. For PhilRice alone, as earlier shown in the video, you have been helping us develop our technical capability in different areas under Monbusho and Ronpaku scholarships, and long-term and short-term training. For this, Mr. Ono, please accept our profound gratitude and we hope that you will continue to support our continuing effort in upgrading our manpower at DA.

We at the Department of Agriculture, in return, hereby commit our unending support to all our endeavors, and specifically to this project. To the extent that we can, both in terms of programs and manpower, and our limited resources, we will continue to provide support to this project we are reviewing today.

I know that there are more projects in the pipeline. This morning we saw and I have witnessed what we have done so far – the rice lines that we are developing - are very promising and once given to farmers for multiplication, these will boost our rice production.

As we plan our programs today, let me inject some of my personal thoughts on what we can do more to enhance this project. While we focus our attention on the improvement in yield as the bottom line of success of this project, I would like to encourage the Team to look at the training component not necessarily for the farmers themselves; I am referring to the housewives and children. In the Philippines, as many of us are aware, we have plenty of idle manpower in the farmers' families. If we can educate the farmer, wife and the children, I think this will enhance their understanding of the different technologies we are introducing to them. Therefore, in our future training programs, the Team should develop a special training aimed specifically to enhance the understanding of the rice farmer family of rice production techniques.

Also, we saw how PhilRice is developing the management information system (MIS). But to me, the bottom line here is how much of this information can we bring to the farmers. We can put all this information in the internet, but if farmers themselves do not have access to this information, the meaning will not be totally appreciated. Therefore, aside from improving the MIS via the information highway, I would also encourage the Team to develop printed materials that the farmers can read in their own language. These materials can be distributed in the countryside, so that not only the farmers but also the wife and the children will understand the technology we bring to them.

I can say that we at DA are very happy on what the projects have accomplished so far. If what I saw this morning will be the basis of what we can do more, I am very optimistic that indeed this project can bring a lot of benefits, not only to PhilRice and Philippine agriculture but more specifically to Filipino farmers.

And so this afternoon, once again we will continue to strengthen our bilateral relations – professionally and technically. I know we can do a lot more. The professional experts who are here, led by Dr. Takahashi, really mean a lot to us. In terms of what they have done for us, we cannot put quantity on it. We really appreciate your dedication and commitment, and you may not know it, you have already been teaching the Japanese way of conducting research in the most effective and productive way. For that we are very thankful to the Japanese team that has been helping us; to JICA for continuing to be our partner in our national effort to satisfy our national food requirement. And last but not the least, our sincere appreciation to the ladies and gentlemen of PhilRice who translate our programs and policies into meaningful action so that in the end the farmer will be benefited toward our common goal of attaining our food security program.

Good afternoon to all.

Discussion (Comments & Suggestions):

Technology transfer

- There has to be a mechanism in the dissemination of technologies as also mentioned by the Advisory Team -- a) collaborate with the existing institutions in the extension activities, b) participation of the local government units (LGUs), non-government organizations (NGOs), and some of the private sector agencies working with farmers in the rural areas, and c) link up with the existing programs of DA especially the Rice program of the government – *Agrikulturang MakaMASA* (agriculture for the masses) Program on Rice so that farmers would really adopt these technologies being generated by the project.

  If these technologies will be transferred/disseminated properly and adopted at the farmer's level, the attainment of rice self-sufficiency is not far.

- The JICA project at PhilRice should interface with the JICA Project at Bohol APC in its second part to address institutional issues in technology transfer as PhilRice focuses on technology generation; APC Bohol on technology transfer. It was strongly suggested to link up these two agencies to accelerate technology transfer, and to receive feedback from farmers then to PhilRice. To that extent, BAR is very much willing to support.

- In as much as technology transfer is no longer part of the project, the Philippine side - the Department of Agriculture - will be very active in technology promotion. At present, the department is massively promoting the use of certified seeds.

Farm mechanization

- It was suggested that in the introduction of technologies, especially machines, these should be properly evaluated in terms of needs, i.e. average farm size - landholding in the Philippines is less than 2 ha per farmer, hence the efficiency of these machines will be underutilized in small areas. These machines should be promoted therefore in contiguous rice farms so that utility of these machines could be optimized.

  On the other hand, it was explained that the project is small farm-based, high-yield modernization as the international event –liberalization will go on – we have to evolve these small farms into something - to be competitive in the world market. In Japan, these small farms are consolidated if not by ownership, by market forces – as hastened by modernization to increase efficiency. At DA, a similar land utilization and rationalization program is being studied that could further help in modernizing what is currently small farm agriculture. Because evidently modern agriculture has to graduate from walking tractors and water buffalos.

- The other consideration – labor displacement. There is abundant labor force in the rural areas and even the limited employment opportunities in the rice industry sector. The introduction of these machines should be studied such that this will not unduly displace labor in the rural areas.

  It was pointed out that the target areas of the project are those areas where there are labor deficits. Most of the major rice-producing areas even in Mindanao have labor deficits during critical stages - crop establishment and harvesting. These technologies precisely and accurately address these concerns, and if these can be extended to farmers/farmers' organizations, labor deficits will be alleviated.

- In farm mechanization, it is not always the question of the design but the problem on the reliability of the machine – as it relates to the problem of metal parts procured locally. Therefore, the suitability of metal parts should be studied. The farmers would want a reliable and durable product that would not require much maintenance because of the problem of servicing. But this type of research is very important and should be pursued.

Varietal improvement

- The project includes development of high quality rice which is also very important. The major problem in some of the rice-producing areas is profitability, and one way to increase profitability is through the production of better quality rice.

- For the second part of the project, the production of glutinous rice which is very important in Filipino food especially during special functions; the development of a high-yielding variety with better quality, and insect pest- and disease-resistant rice variety should be pursued.

- It was suggested that the Philippine side should widen the horizons of the applicability of the technologies being generated. For the cold-tolerant lines being developed, for example, these are also suited in some areas in Mindanao.

General comment

- The committee was impressed with the results of the project, and with what it has accomplished so far. Both the Japan and Philippine sides will continue to provide support in increasing rice production and in the attainment of the rice self-sufficiency program of the Philippines.

Closing Remarks

Dr. Santiago R. Obien
Executive Director, PhilRice

Ladies and Gentlemen:

All is well that ends well. That, to my mind, is the summary of our weeklong activity that we are ending today with this Joint Coordination Committee Meeting. This became possible because we have done the right things right ever since we started this cooperation. The consultative nature of our work likewise contributed to the smooth conduct of each of the activities we have gone through since last week.

I would like therefore to thank everyone involved in this successful undertaking. First and foremost: the Japanese Advisory Team, led by Dr. Akihiro Gondoh, and his members – Dr. Okamoto, and Messers Sawamura, Matsumura, and Kaneko. You have all come at a most crucial time when the implementation of our technical cooperation is beyond halfway through. And you have come at this time as we approach the inevitable and welcome change of top PhilRice leadership.

But before everything else, I am very happy to learn that our JICA friends who visited our country for the first time enjoyed their brief sojourn in the Philippines. I refer to their trip to the world-famous Ifugao rice terraces in Banaue. It is one place in our country which is known far and wide, it being considered as the "eighth wonder of the ancient world" and has declared as a cultural heritage by no less than the UNESCO.

At this time we wish to express our gratitude to the top leadership of the Philippine Department of Agriculture, represented today by Undersecretary Cristino Collado, Assistant Secretary Segfredo Serrano, and Dr. Eliseo Ponce. We are indebted as well to the other members of the Joint Committee, consisting of other DA officials, JICA, the NEDA, PCARRD, and UP Los Banos.

We wish to reiterate our conviction that our technical cooperation project is being implemented properly by both the Japanese and Philippine sides, just as it was planned properly by the concerned parties. Our outputs so far are highly satisfactory, and all indications suggest that we will successfully attain our overall goal. All of these are happening as a result of our deliberate efforts to make the project succeed at a most mutually efficient and effective manner.

Indeed, the past seven years or so have been productive and self-fulfilling years for JICA and Philippine scientists and researchers. First, they have struck a close fraternal bond fired by the common goal of providing more and better food, particularly rice, for the ever-growing population of our planet. They learned from each other in many aspects – work ethics, culture, personal relationship, way of life. And nothing can be more heartwarming than seeing two peoples earnestly working for the good of humankind.

We are very thankful for the full cooperation of our JICA experts here who have made certain that the role and responsibilities of the Japanese government in the technical cooperation are carried out. In return, we here at PhilRice, in behalf of our government, have done everything possible, perhaps pushing ourselves close to the limit at times, just to meet the expectations of our counterparts. It has been a pleasure to work with them, no matter how challenging the expectations had been.

Particularly, we wish to thank JICA team leader Dr. Hitoshi Takahashi for working hard to have everything ready for the construction of the National Rice Engineering and Mechanization Center. Our construction workers started this March, and will finish the center by June of this year. Being the third infrastructure project fully funded by JICA, the Center will spearhead R&D on rice engineering and mechanization in the Philippines.

Earlier in July 1999, the Cold Tolerance Screening Facility, the second JICA-fully funded infrastructure project, was completed, and experiments to test the physical and mechanical aspects of the facility were immediately done two months later in September 1999.

As we recognize and take pride in everything that the technical cooperation project has done thus far, we likewise reconfirm our resolve to implement the unfinished portion of the project in a similar manner, perhaps even much better. Change in leadership will not be a concern here in as much as the commitment of both sides had been always evident and proven. The project is likewise supportive of the Medium-Term Philippine Development Plan that the incumbent Philippine presidency is currently pursuing.

In all these years that we have been joining hands in our scientific pursuit of new rice technologies, one man stands out as a shining light in the JICA-PhilRice professional relationship. I refer to Dr. Hitoshi Takahashi, the profound, scholarly, ever-smiling, and approachable team leader of JICA at PhilRice. The institute, in particular, and the Filipino people, in general, owe this great Japanese scientist so much. Our great friends, Dr. Takahashi, did — and has done his best - and for that PhilRice is eternally grateful.

The JICA experts who have served at PhilRice over the past seven years under the TCP also deserve the superlative degree of our admiration. To paraphrase a great Roman general of old: They came, they saw, they conquered.

I also take pride in the accomplishments of their PhilRice counterparts. They are young, vigorous, among the best in the local research world, and full of enthusiasm to serve their country and people.

Indeed, we cannot ask for more from the Japanese and PhilRice scientists.

By the time that the Joint Coordination Committee meeting will be held in the year 2001, I will no longer be the Executive Director of PhilRice. I assure you, however, that I will remain proud of what this technical cooperation project has done and will do. With the continuing cooperation and commitment of both sides, this cooperation project is headed for a much brighter and more successful tomorrow.

And years from now, when we gather in the long rainy evenings to talk of the years when we were working hand in hand to come out with the best rice technologies, varieties, and practices, certainly we will think of the Japanese and PhilRice scientists who gave their all to help shape a better tomorrow for our increasing population.

For my real closing remarks now, let me say that it has been a profound honor and privilege to work with all of you. As early as now, I am saying that one of my most cherished accomplishments as PhilRice Executive Director is having helped to establish and keep this fruitful partnership with JICA, representing the government of Japan.

Thank you very much, and let me now begin to say goodbye.

PARTICIPANTS

Joint Coordination Committee

1.	Hon. Cristino M. Collado *Vice Chairman*		Undersecretary, DA
	Members:		
2.	Dr. Santiago R. Obien		Executive Director, PhilRice
3.	Dr. Leocadio S. Sebastian		Dep. Exec. Director for R & D, PhilRice
4.	Mr. Ronilo A. Beronio		Dep. Exec. Director for Admin., PhilRice
5.	Dr. Hitoshi Takahashi		Leader, JICA Expert Team
6.	Mr. Takanobu Nawashiro		Coordinator, JICA
7.	Mr. Takehiko Sasaki		Plant Breeding Expert, JICA
8.	Engr. Shuji Ishihara		Farm Mechanization Expert, JICA
9.	Mr. Shoji Furuya		Agronomy Expert, JICA
10.	Mr. Mizuhiko Nishida		Soils and Fertilizers Expert, JICA
11.	Mr. Hiroshi Okadome		Food Science Expert, JICA
12.	Mr. Takayuki Aihara		Information System Expert, JICA
13.	Mr. Hideo Ono		Resident Representative of JICA, Philippine Office
14.	Dr. Eliseo R. Ponce		Director, DA-Bureau of Agricultural Research
15.	Ms. Adamar Estrada Project Development Officer III	(for)	Mr. Francisco A. Ramos III Chief, Project Coordination & Management Division, DA
16.	Mr. Jose Bernardo OIC, Crops Division	(for)	Mr. Felizardo Vertucio Jr. Director, Agriculture Staff, NEDA
17.	Ms. Rosalina G. Almendral Sr. Economic Dev't Specialist	(for)	Mr. Rolando G. Tungpalan Director, Project Monitoring Staff, NEDA
18.	Mr. Andrew Valdevilla		Dr. Patricio S. Faylon Executive Director, PCARRD
19.	Dr. Akihiro Gondo		Leader, Japanese Advisory Team
20.	Dr. Masahiro Okamoto		Member (Rice Varietal Improvement), Japanese Advisory Team
21.	Mr. Nobuyuki Sawamura		Member (Farm Mechanization), Japanese Advisory Team
22.	Mr. Osamu Matumura		Member (Agronomy), Japanese Advisory Team
23.	Mr. Kenji Kaneko		Member (Technical Cooperation), Japanese Advisory Team

Observers and Technical Support

JICA Philippine Office

24.	Mr. Tetsuji Iida	Deputy Resident Representative
25.	Mr. Takahiro Ota	JICA Expert, DA

DA

26.	Dr. Segfredo R. Serrano	Assistant Secretary
27.	Ms. Marilyn T. Maestrado	Project Development Officer III

DA

28. Mr. Jonathan Ponce
29. Mr. Mario Ramos
30. Mr. Marford Ponce

PhilRice Board of Trustees

31.	Mr. Rustico A. Pinli	Member

Local Machine Manufacturers

32.	Mr. Bonifacio Isidro	Manager, C&B Crafts
33.	Mr. Lawrence Morallo	Manager, Morallo Iron Works

PhilRice

34.	Mr. Hermenegildo C. Gines	Head, Agronomy & Soils Div. (ASD)
35.	Dr. Alejandra B. Estoy	Head, Crop Protection Div. (CPD)
36.	Engr. Ricardo F. Orge	Head, Rice Eng'g & Mechanization (REM)
37.	Ms. Marissa V. Romero	Head, Rice Chemistry & Food Science (RCFS)
38.	Ms. Irene R. Tanzo	Head, Socioeconomics Division (SED)
39.	Ms. Karen Eloisa T. Barroga	Head, Communication Division
40.	Mr. Paterno I. Rebuelta	Head, Training Division
41.	Mr. Roger F. Barroga	Head, Management Information System (MIS)
42.	Dr. Renando O. Solis	Program Leader (PL), Direct-Seeded Irrigated Lowland Rice

43.	Dr. Teodula M. Corton	PL, Rice for Adverse Environments
44.	Dr. Sergio R. Francisco	PL, Rice-Based Farming Systems
45.	Mr. Hilario C. dela Cruz, Jr.	Chief Science Research Spec (SRS), PBD
46.	Ms. Evelyn F. Javier	Senior SRS, ASD
47.	Ms. Myrna U. Malabayabas	Senior SRS, ASD
48.	Mr. Wilfredo B. Collado	Senior SRS, ASD
49.	Mr. Fernando D. Garcia	SRS, ASD
50.	Engr. Eulito U. Bautista	Chief SRS, REM
51.	Engr. Rizaldo E. Aldas	Senior SRS, REM
52.	Ms. Lina B. Flor	Senior SRS, CPD
53.	Dr. Fe A. dela Peña	Senior SRS, CPD
54.	Ms. Jennifer J. Tagubase	SRS, CPD
55.	Ms. Juma Novie A. Ayap	Senior SRS, RCFS
56.	Ms. Nanette V. Zulueta	SRS, RCFS
57.	Ms. Cheryll B. Casiwan	Science Research Specialist, SED
58.	Ms. Alice M. Briones	Senior SRS, SED
59.	Ms. Teodora L. Briones	Dev't. Mgt. Officer III, PCPO
60.	Mr. Consolacion D. Domingo	Information Systems Analyst, MIS
61.	Ms. Evangeline B. Sibayan	Administrative Officer V, Visitors and Conferences Services Office (VCSO)
62.	Ms. Beti Merilou Redoña	Public Relations Officer II, VCSO
63.	Mr. Johny S. Villanueva	Audio Visual Equipment Operator III
64.	Mr. Carlito N. Bibal	Creative Arts Specialist, Comm Division
65.	Mr. Gaudencio del Rosario	Photogtrapher
66.	Mr. Rodolfo Fernandez	Consultant
67.	Dr. Miguel L. Aragon	Research Fellow