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

The PhilRice Corporate Plan 1995-2000

Approved by the Board of Trustees
at its 28th Meeting
16 January 1996 at PhilRice
Maligaya, Muñoz, Nueva Ecija

Chapter 1 Background and Brief History

THE INSTITUTION BUILDING PERIOD

The Initial Framework

The idea for the establishment of the Philippine Rice Research Institute (PhilRice) started within the confines of the University of the Philippines as then UP President Edgardo J. Angara created a committee that explored the possibility of establishing a national rice research institute. The idea of creating PhilRice considered the existence of the International Rice Research Institute (IRRI) on the campus of the University of the Philippines Los Baños (UPLB), and IRRI's powerful influence on Asian rice and rice-based agriculture.

The following statement issued by the then UP President and now Senator Edgardo J. Angara captures the main justification for the establishment of PhilRice:

I think the Philippines took for granted, because IRRI was here, (that there was no) need to do our own research in rice. And that was a mistake. Because in research, especially in rice research, there are two important things: the discoveries on improved varieties and the training of farmers. And if you have no domestic research organization that will receive these findings on improved varieties and also that will receive the technology, then you will not be able to profit from the presence of an international organization like IRRI.

UP President Angara and then Minister of Agriculture and Food, Dr. Salvador H. Escudero III, upon instructions of then President Ferdinand E. Marcos, caused the drafting of the charter for the establishment of PhilRice. This charter became Executive Order No. 1061 dated November 5, 1985, which placed PhilRice as an agency under the Ministry of Agriculture, and within the campus of the University of the Philippines Los Baños. Under its charter, PhilRice shall be responsible in developing a rice research and development program so as to sustain the gains already made in rice production, improve the income and economic conditions of small rice farmers, expand employment opportunities in the rural areas, and ultimately promote the general welfare of the people through self-sufficiency in rice production. On November 7, 1986, then President Corazon C. Aquino issued Executive Order No. 60, which amended Executive Order 1061. The Executive Order further strengthened PhilRice by empowering it to direct and coordinate the rice research and development activities of all agencies working on rice. As contained in Executive Order No. 60, sectoral representations in the PhilRice Board of Trustees also increased.

2 The Institution Building Period

The First Seven Years

While November 5, 1985 was the date of the approval of the charter of PhilRice, the institute commenced its full operation in June 1987. The seven-year period from 1987 to 1994 marked the PhilRice's institution building period. During this period, the country's agricultural science community has witnessed a national rice research institute emerge to rationalize the country's rice research and development efforts. The creation of PhilRice has transformed into reality the desire of the Philippines to carry out a strong national rice research and development program, thus enabling the country to benefit more from the presence of IRRI.

In the first seven years of its existence, PhilRice built a strong organization, developed a critical mass of scientists, researchers, trainors, and administrators, established a world-class research and support infrastructure and facilities, and forged solid national and international research linkages. During the same period, the institute conducted basic and applied researches. PhilRice established and implemented eight major program thrusts for research and development, which contributed to enrich the scientific base of the country's rice research and development system.

Three former secretaries of the Department of Agriculture (DA), namely: Ramon V. Mitra (1986-1987), Carlos G. Dominguez (1987-1989), and Senen C. Bacani (1989-1992), and the incumbent secretary, Roberto S. Sebastian (1992 to present), have already chaired the PhilRice Board of Trustees. They have made significant contributions to the growth of PhilRice during their respective terms.

In March 1986, Hon. Ramon V. Mitra, in consultation with then UP President Angara, constituted the PhilRice Board of Trustees. Three cabinet members, representatives of the science and academic communities, the farmers, the consumers , and the traders composed the board. The board was responsible for approving the implementation of the eight program thrusts prepared by an Executing Committee chaired by now UPLB Chancellor Ruben L. Villareal.

Under the leadership of Hon. Carlos G. Dominguez, PhilRice took over two DA research stations, namely: a) the Midsayap Experiment Station in Midsayap, North Cotabato, and b) the Maligaya Rice Research and Training Center in Muñoz, Nueva Ecija. Dominguez made the crucial decision to establish the Central Experiment Station of PhilRice in Maligaya. Eventually, PhilRice laid down the ground work for the Japan International Cooperation Agency (JICA) grant-aid for the construction of the new laboratories and facilities during the term of Secretary Dominguez.

Under the leadership of Hon. Senen C. Bacani, the modern laboratories and facilities were completed and turned over by JICA to PhilRice on 15 March 1991. Thus, PhilRice has a home of its own. At the same time, PhilRice took over the Cagayan Valley Experiment Station in San Mateo, Isabela.

Hon. Roberto S. Sebastian introduced the key production area (KPA) approach to agricultural development. The Department of Agriculture's banner program to increase rice production, the Grains Production Enhancement Program (GPEP) focuses on key production areas for rice. PhilRice plays a key role in the GPEP, specifically the generation and promotion of technologies in the KPAs.

The important events that took place during the first seven years of PhilRice are as follows:

The Establishment of the Central Experiment Station

The PhilRice Board of Trustees selected Maligaya as the site of the Central Experiment Station. The transfer of the PhilRice headquarters from the UPLB campus to Maligaya was a symbolic decision. The transfer strengthened PhilRice independence by physically moving out under the shadows of IRRI and UPLB. Furthermore, the institute moved closer to a major rice-producing region in the country, the Central Plain of Luzon. The location of the region is strategic to serve other major rice-producing areas in Luzon.

On March 15, 1991, the Japanese Government, through JICA, turned over to PhilRice new office building, laboratory and field service buildings, training dormitory, and canteen. There were improvements carried out on the experimental farms such as the drainage canals, powerhouse, greenhouses and head houses, and farm equipment and supplies. The JICA grant-aid amounted to US $ 15.7 M for the development of the Central Experiment Station in Maligaya.

Human Resource Capability Buildup

The achievement in human resource capability building was significant. Financial assistance out of regular allocation from the national government and foreign donors supported scholarship and training. PhilRice also recruited high-caliber research staff and research fellows to join the institute. These human resource capability buildup strategies created a high level of professional competence in PhilRice as a research agency of the Department of Agriculture.

National and International Research Linkages

At present, the Philippine Rice Research and Development Network (PRRDN) has 56 member institutions. Research stations of the DA, state colleges and universities, and national research institutions are members of the network. However, the operation of the network requires major restructuring. The creation of a formal structure for the network is an urgent task. PhilRice is exploring to improve the categories of network members, whether branch stations, regional stations, or testing centers. There is a plan to categorize regional and local networks with defined roles to cover the major rice-producing areas.

PhilRice exerted serious efforts for international cooperation. The institute has already existing linkages with international research institutions, foreign universities, and international donor agencies. The institute is further strengthening its linkages with national rice research centers within the Southeast Asian region.

Program Thrusts

PhilRice started by laying down the research and development foundation for eight major program thrusts. These program thrusts are: a) rice varietal improvement, b) planting and fertilizer management, c) integrated pest management, d) rice-based farming systems, e) rice engineering and mechanization, f) rice chemistry and food science, g) social science and policy research, and h) technology promotion. These programs are multidisciplinary. The division leading the program is providing the organizational and administrative support.

Contents

INTRODUCTION

REVIEW OF INSTITUTIONAL PURPOSES AND OBJECTIVES

REVIEW OF THE PhilRice PROGRAMS
- Rice Varietal Improvement Program
- Planting and Fertilizer Management Program
- Integrated Pest Management Program
- Rice-Based Farming Systems Program
- Rice Chemistry and Food Science Program
- Rice Engineering and Mechanization Program
- Social Science and Policy Research Program
- The Technology Transfer Program

Chapter 2 Review of Accomplishments

INTRODUCTION

Before formulating the detailed operational planning framework, it is useful to have a review of the accomplishments of the research and development program thrusts.

Chapter 2 begins by reviewing the goals and objectives contained in the PhilRice charter. Then a detailed review of the accomplishments of the eight program thrusts follows, which covers the period from 1987 to 1994. The review also covers the operational and administrative support to research and development.

REVIEW OF INSTITUTIONAL PURPOSES AND OBJECTIVES

The institutional goal of PhilRice is to contribute to the growth of the country's rice industry through research and development. The purposes of creating PhilRice were as follows: 1) planning and implementing a national rice research and development program, 2) sustaining the gains made in rice production, and 3) solving location-specific problems of the whole rice industry. Furthermore, 4) directing and coordinating the rice research and development activities of all agencies working on rice was added as a purpose of establishing PhilRice.

Within a span of seven years, PhilRice has carried out a strong institutional development agenda on rice research and technology promotion. The institute has initiated the setting up of a national rice research and development program. Similarly, the institute has laid down the framework for a nationally directed and coordinated research and development activities on rice. On the other hand, PhilRice has shown the potentials of becoming a research institution that could play a primary role in sustaining the gains made in rice production. PhilRice has accomplished the right job at the very appropriate time, when a national rice research and development institute is both considered as an economic and a political necessity.

Rice production remains to attain major technological breakthroughs. There are fundamental technological problems concerning the rice industry that PhilRice shall help to resolve. Finding solutions to location-specific problems of the whole rice industry shall be a primary task of PhilRice. The generation and use of location- specific rice production technology shall be the institute's major thrust by the turn of the next century.

For PhilRice, the job has just started. To fulfil the institute's longterm mission, organizational restructuring at this stage is both appropriate and urgent to meet the rapid expansion of research and technology promotion. Although PhilRice has started at the right track, structural reforms in program implementation involving the country's rice research and development system have to take place. PhilRice shall be in the frontline of these much-needed program reforms. A balanced perspective between production-centered goal, and beneficiary-focused research and development agenda shall guide PhilRice in fulfilling its goal.

REVIEW OF THE PHILRICE PROGRAMS

PhilRice was established and is implementing eight major program thrusts. The design of these programs is multidisciplinary. Seven research programs should converge at the technology transfer program. The program thrusts of PhilRice are described as follows:

Rice Varietal Improvement Program

The Rice Varietal Improvement Program strives to improve and stabilize yields of important agro-ecological types of rice through breeding as well as facilitate the production of basic seeds of rice varieties approved by the National Seed Industry Council.

Planting and Fertilizer Management Program

The Planting and Fertilizer Management Program aims to further improve and sustain the productivity of soils planted to rice with cost reducing & highly eficient inputs. It also strives to develop efficient planting methods and water management that can boost high yield rice production.

Integrated Pest Management Program

The Integrated Pest Management Program strives to develop, validate, demonstrate, and fine-tune appropriate location-specific pest management approaches that will improve and sustain rice yields, as well as maintain a high level of environmental stability and public safety.

Rice-Based Farming Systems Program

The Rice-Based Farming Systems Program aims to identify opportunities and solve constraints in the improvement of rice farming systems through research and development strategies. It looks into all the farm components and how cropping pattern, cultural management, and crop-livestock integration can help increase farm productivity and income.

Rice Chemistry and Food Science Program

The Rice Chemistry and Food Science Program strives to improve rice grain quality in support of the Rice Varietal Improvement Program, and to establish grain qualities preferred by various consumer groups and maximizes the use of rice and its by-products.

Rice Engineering and Mechanization Program

The Rice Engineering and Mechanization program aims to increase rice production by improving farm mechanization and the uses of land and water resources. It also strives to develop postharvest technologies for rice and its by-products.

Social Science and Policy Research Program

The Social Science and Policy Research Program strives to hasten and increase the effectiveness of the technology development and adoption processes. It also aims to strengthen the institutional support for rice production and to improve the policy environment effecting the rice farmer.

The Technology Promotion Program

The Technology Promotion Program verifies, packages, and disseminates location-specific rice and rice-based technologies.

Table 2.1 presents the summary of accomplishments.

ACCOMPLISHMENTS, 1987-1995

Rice Varietal Improvement Program

a. Continued conventional breeding strategies supplemented by non-conventional methods such as tissue culture, wide hybridization, mutation breeding, and development of hybrid rice. From 1987-1995, 31 new varieties have been approved by the Philippine Seed Board for commercial release.

Table 2.1 Rice varieties approved by the Philippine Seed Board (1987-95).

Year	Variety	Popular Name	Ecosystem	Average[a] Yield t/ha	Max Yield observed in in Test Locations (t/ha)
1987	IR66	IR66	Irrigated	5.3	5.9
	BPI Ri12	BPI Ri12	Irrigated	4.9	5.8
1988	IR68	IR68	Irrigated	4.5	4.6
	IR70				
	IR72	IR72	Irrigated	5.0	7.1
	IR74	IR74	Irrigated	4.7	5.3
1990	PSB Rc1	Makiling	Upland	2.4	3.9
1991	PSB Rc2	Molawin	Irrigated	4.9	7.1
	PSB Rc4	Nahalin	Irrigated	4.6	6.1
1992	PSB Rc6	Carranglan	Irrigated	5.7	6.9
	PSB Rc8	Talavera	Irrigated	5.4	7.1
	PSb Rc10	Pagsanjan	Irrigated	5.1	7.5
	PSB Rc12	Caliraya	Rainfed Lowland (drought prone)	3.8	4.0
	PSB Rc14	Rio Grande	Rainfed Lowland (drought prone)	3.8	5.1
1993	PSB Rc16	Ennano[b]	Rainfed Dry Seeded (drought prone)	2.7	4.3
1994	PSB Rc 18	Ala	Irrigated Lowland	5.1	6.5
	PSB Rc 20	Chico	Irrigated Lowland	5.2	6.1
	PSb Rc 22	Liliw	Irrigated Lowland	5.0	7.2
	PSb Rc 24	Cagayan	Rainfed Lowland Dry-Seeded	3.1	4.1
	PSB Rc 26H	Magat Hybrid	Irrigated Lowland (particularly Cagayan and Isabela provinces)	5.6	7.6

[a] Irrigated = 10 locations; rainfed = ____ ; upland = ____;
[b] Selected traditional variety

1995	PSB Rc 28	Agno	Irrigated		4.7	9.0
	PSB Rc 30	Agus	Irrigated		4.7	8.0
	PSB Rc 32	Jaro	Irrigated		4.7	8.8
	PSB Rc 34	Burdagol [a]	Irrigated		4.8	10.3
	PSB Rc 36	Ma-ayon [b]	Rainfed	2.7		4.9
	PSB Rc 38	Rinara [b]	Rainfed (transplanting)	3.2		4.4
	PSB Rc 40	Chayong	Rainfed (transplanting)	2.8		4.4
	PSB Rc 42	Baliwag	Rainfed (dry-seeding)	3.2		3.6
	PSb Rc 44	Gohang	Cool elevated	4.2		4.7
	PSB Rc 46	Sunadel	Cool elevated	4.2		4.7
	PSB Rc 48	Hagonoy	Saline prone	2.7		5.5
	PSB Rc 50	Bicol	Saline prone		2.97	4.34

[a] Farmers' selection (HYV),popular in Mindanao & some Visayan Provinces.

b. Continued evaluation of breeding materials in a wide range of targetted environments, and identified other breeding lines such as:

- PRIA — cytoplasmic male sterile line for hybrid rice breeding
- PR23388-104 — excellent grain quality
- PR23388-93 — resistant to bacterial leaf streak, bacterial leaf blight, stemborer deadheart, and glume discoloration
- four new molecular markers tightly linked to green leaf hopper resistance gene and tungro disease

c. Expanded germplasm collection, documentation and preservation. The PhilRice collection now consists of 3,180 accessions

d. Identified varieties and breeding lines for Mt. Pinatubo affected areas

Zone A (≤10 cm ash depth) :	BPI Ri10	PSB Rc2
	IR60	PR23384-13
	PSB Rc4	PR23370-5
	IR72	PR22378 (Promising Line)
Zone B (>15 cm) :	BPI Ri10	IR72
	PSB Rc2	PR23357- (Promising Line)
	PSB Rc6	PR23405-9 (Promising Line)
Zone C (> 30 cm) :	IR68	UPL Ri7
	C22	IR47686-09-4-1 (Promising Line)
	UPL Ri5	

e. Accelerated production of basic seeds for research

PLANTING AND FERTILIZER MANAGEMENT PROGRAM

Improved seedling management and crop establishment practices

For transplanting as mode of establishment, optimum seedling age of transplants (25-30 days old) was identified. A set of cultural management recommendations for old seedlings was generated. The optimum number of seedlings per hill was 2-4. Plant spacing varied with variety and planting season. Closer spacing is recommeded during the dry season (10-15 x 20 cm) and normal spacing (20 x 20 cm) during wet season. *Appropriate combination of variety, plant spacing, and nitrogen fertilizer regime led to* the full expression of varietal yield potential in a given rice growing area.

For direct seeded rice, appropriate seeding rate (60-80 kg/ha) and nitrogen (N) fertilizer management were identified. Technology for anaerobic seeding was formulated and recently verified at farmers' level.

Conducted fertilizer and nutrient (NPK) management studies

Inorganic fertilizer levels, the timing and rate of application for rice cultivars are being conducted to optimize the utilization of applied nutrients. For instance, such as some rice cultivars have low response to N fertilizer (90-100 kg/ha) while other rice cultivars give higher yields at 120-200 kg N/ha during dry season.

Refined nutrient (Nitrogen, Phosphorous, and Potassium) management technology for maximizing yield of current rice cultivars up to 10 t/ha during dry season

Attempts were made to increase the yield of current cultivars through the identification of proper cultural management combinations such as plant spacing, fertilizer levels, management regimes, and other practices. Recent results showed that the yield potential of the Philippine rice cultivars could be raised from 6 to 9 t/ha during the dry season and 4 to 5 t/ha during wet season.

Explored utilization of green manures and organic fertilizers to reduce dependence on inorganic fertilizers

Green manures such as *Sesbania rostrata, Aeschynomene afraspera*, mungbean, and *Indigofera tinctoria* were found to be effective green manures in intensive rice and rice-based cropping schemes. Depending on the soil fertility or factors that favor the growth of these green manures, they serve as supplemental fertilizers that can substi*tute inorganic fertilizer use from 1/5 to 1/2 of the recommended levels.*

Continued long-term fertility studies as indicators of sustainability of intensive rice cropping systems

A long-term fertility experiment in intensive rice systems was established in 1968 by IRRI. The experiment serves as yield monitoring setup at PhilRice. The declining yields, *coupled with decreasing soil quality over time, was observed. Soil fertility management* options based on nutrient input/output balances, importance of yield target, straw recycling, and other fertilizer management recommendations were generated in this

experiment. Over the years, the long term experiment has seved as basis of relevant basic research related to nutrient sustainability or carrying capacity of intensively cropped soils. Research protocols were also generated out of experiences in the long term fertility studies.

Conducted major exploratory collaborative research on:

- **Systems analysis and simulation**
  To enable members to quantitatively relate rice varietal yields to management and climatic conditions, predict rice yields in different environments, and do yield gap analysis.

- **Inter-regional research on methane emission**
  The effect of current and advanced technologies on methane emissions from irrigated rice fields was studied at PhilRice as part of regional research in methane emission. Initial results showed that methane emissions are highly variable but have a distinct seasonal pattern, with peaks in early growth stage, panicle initiation, flowering, and ripening periods of the rice plant.

- **Management of ash-laden soils in Central Luzon**
  In areas with 10-15 cm ashfall, rice (PSB Rc2, PSB Rc4 and PR 23383-28) grain yields could be increased from 1.4 to 4.5 t/ha as nitrogen (N) applied increased from 60 to 120 kg/ha. Incorporation of green manure (*Aeschynomese afraspera*) with each N rate 45 days after seeding increased yield by 0.4 to 0.9 t/ha.

- **Reversing trends of declining productivity in intensive rice systems**
  A collaborative work with IRRI, the project aims to provide baseline data set on soil quality and productivity levels achieved by rice farmers in the five intensive rice-growing domains of tropical Asia (Nueva Ecija for the Philippines). This data will be used to evaluate the relationship between productivity and soil quality, to develop improved soil fertility management strategies, and to quantify trends in productivity and soil quantity over time.

  A novel approach is employed which involves monitoring of soil quality indices, crop management practices, and economic performance in farmers' fields; and comparing on-farm performance with results from a long-term fertility experiment at a nearby station (PhilRice for the Philippines) In summary, progress to date exceeds expectation and more activities are scheduled at Philippine site.

- **Integrated nutrient management of different cropping sequences in rainfed lowland condition (Rainfed Lowland Rice Research Consortium)**
  This collaborative project with IRRI focuses on the characterization, replicability or radiation, and sustainability of rice-upland crops cropping sequence in a rainfed ecosystem. The site in Batac, Ilocos Norte, having the most intensive cropping scheme of this type. Strategic research involving on-station and farmers' field experimental setups are ongoing to evaluate the potential radiation of these cropping systems to other areas, their productivity, sustainability (carrying capacities of soil, water, climate, etc.) for a long-term intensive production.

INTEGRATED PEST MANAGEMENT PROGRAM

Participated in varietal improvement program that led to the identification and recommendation of the following varieties:

- PSBRc18 ——— intermediate resistance to stemborer and GLH
- PSBRc20 ——— intermediate resistance to stemborer and GLH
- PSBRc22 ——— intermediate resistance to stemborer and GLH; resistant to BPH 1 and BPH 2
- PSBRc24 ——— intermediate resistance to stemborer and GLH; resistant to BPH 1 and BPH 2
- Magat Hybrid — intermediate resistance to BPH3

Validated strategies for stemborer management without the use of insecticides

- crop establishment during regular planting time in the area
- synchronized planting
- use of early-maturing varieties
- use of moderately resistant varieties
- proper water management
- proper fertilizer management

Established a farmer-based pesticide reduction strategy of no spraying at least 30 days after transplanting or 40 days after direct-seeding

In collaboration with farmers and scientists from IRRI, FAO, and DA, it was established that, in irrigated areas with distinct dry and wet seasons and where planting is synchronized, pests (mainly leaf feeders) pose no serious threat to rice plants within the first 30 (transplanted) or 40 (direct-seeded) days and thus require no chemical control. From 1993 to the present, farming barangays which adopted this technology reduced their pesticide inputs by as much as 90%.

Completed a comprehensive insect pest and disease profile for Mindanao for use in strategic research planning and technology deployment

Rice tungro virus and white stemborers are the most serious disease and insect problems, respectively, in Mindanao rice areas. Asynchronous planting and the use of susceptible varieties are the main causes of pest and disease outbreaks. Currently, the black bug is the major rice pest in Region IX and ARMM, and poses a serious threat to rice production in Mindanao.

Developed appropriate cultural management for rice tungro utilizing resistant rice varieties and proper planting time

Observance of proper planting time and use of varieties (IR56 nad IR62) moderately resistant to green leafhopper have significantly reduced damage due to rice tungro.

RICE-BASED FARMING SYSTEMS PROGRAM

Established profitable rice-based cropping systems

In rainfed rice farming systems research, the program has established the profitability of the following dry season crops after rice:

- Wet seeded rice - Sweet potato
- Transplanted rice - mungbean
- Upland rice + Cowpea - Yellow corn
- Upland fancy rice - Corn

Developed contour hedgerow techniques for sloping upland areas

The establishment of contour hedgerows using forage grasses effectively controlled erosion and increased soil organic matter in sloping upland areas. Based on a two-year observation, double strips (50 cm apart) of forage species *Desmanthus virgatus, Desmodium rensonii* and *Flemingia macrophylla* drilled along contour furrows reduced erosion by 50-75%. When these contour plants were cut every 45-60 days and spread as mulch/organic fertilizer along the alleyways, organic matter increased to 3.05%, compared to only 1.59% in alleys with no hedgerow.

RICE ENGINEERING AND MECHANIZATION PROGRAM

Maligaya Rice Hull Stove

This stove has been commercialized since 1993, with an estimated 6,000 to 10,000 users/adoptors as a result of aggressive promotion through training, communication media, and inter-agency collaboration. It is a technology designed for women — it is simple and easy to use and make, low-cost, and utilizes a waste product in the rice farming system, thus minimizing the use of wood-based or oil-based fuel and promoting environmental preservation.

Maligaya Flat-bed Dryer

The Maligaya flat-bed dryer is the simplest technology on grain drying so far developed. As a modification of previous designs introduced in the 1970s by UPLB and IRRI and adaptation from Vietnam, the dryer is expected to correct the limitations of the past designs. It has high capacity; it can be assembled by farmers themselves (with minimum metal parts); it is highly efficient as it does not require manual mixing of the grains during drying; drying cost is lower because it utilizes rice hull for heating the drying air; it is versatile as it can be used for both seed and commercial paddy purposes; and its operation is simple enough for farmers. Five units have been set up in 1994 and at least 10 units are targetted to be set up this year.

Rice Stripper Harvester

Developed at IRRI and refined by PhilRice for local conditions, the rice stripper offers an efficient method of harvesting and threshing the paddy (with a separate machine) on the same day, thereby minimizing losses from the operations and from in-field handling. PhilRice, in collaboration with IRRI and GTZ, has trained one manufacturer in Isabela for mass production of the design; 33 units have been sold so far in Isabela, Cagayan, Ilocos, Pangasinan, and Nueva Ecija and another 10 units were sold by a manufacturer in Los Banos being assisted by IRRI . Two manufacturers in Bicol are presently being trained and accredited, while two from Iloilo and another from Mindanao are programmed for technical assistance this year.

Rototiller

Designed as an additional attachment of the power tiller to facilitate faster and better puddling of wet fields than the conventional comb harrow and tiller cagewheels, the rototiller is a simple and ingenious rotovator utilizing the chain and sprocket assembly. It is simple and can easily be fabricated by small shops. The design is now included in the GPEP Techno Adaptation for testing in different conditions of the country.

Rice Drum Seeder

Designed to allow direct seeding and for farmers to save on seeds, the PhilRice-modified drum seeder is also being adopted by farmers in Nueva Ecija, Isabela, and Cotabato. It enables farmers who are broadcasting to save at least P1,000 per ha. Several manufacturers in the area have been trained and an estimated 50 units have been slowly sold by cooperating manufacturers in these areas.

Rice Micromill

Designed for village-type operation in remote areas, the micromill is being manufactured in Ilocos Norte, in Leyte, and in Bicol. Two models have been designed: the household model which is popular in Ilocos and Leyte, and the village model in Bicol. It has a better performance, i.e., milling and head rice recoveries, than the kiskisan. It also can be used for grinding and milling legumes and corn.

Improved Rice Flour Mill

The rice flour mill is a locally developed machine that can turn dry rice into rice flour, which is suitable for cooking into traditional rice food products (such as rice cakes) and even modern products (such as chiffon cakes, brownies, and waffles). The mill produces fine dry flour with longer shelf life than the traditionally wet-ground rice paste used for native rice products.

RICE CHEMISTRY AND FOOD SCIENCE PROGRAM

Conducted grain quality improvement research in support for the rice varietal improvement program

- Established grain quality preferences of consumers
- Evaluated acceptability of grain quality of promising rice lines

Explored rice food product development and improvement on:

- Baked food products (cake, brownies, waffles) from rice flour
- Improvement of bihon quality
- Improvement of traditional rice-based food products
- Utilization of low quality rice and rice by-products into rice wine and vinegar

Initiated development and improvement of rice food processing equipment

- Survey and documentation of traditional processing equipment
- Evaluation and improvement of traditional processing equipment

SOCIAL SCIENCE AND POLICY RESEARCH PROGRAM

Regular monitoring of rice farming households and establishment of the social taxonomy of rice farmers

These two projects established the database for the Social Science and Policy Research Program of PhilRice. The regular monitoring of the same rice farm households was done to have a continuing, in-depth, and reliable basic information on the socio-economic status of rice farmers and their households, rice production and distribution, prices, credit, employment, and other relevant information. On the other hand, the social profile provided a comprehensive context for the entry, spread, and use of rice technology. The social characterization serves as benchmark data against which change may be gauged in the future.

Bibliography of social science research related to rice and handbook on Philippine rice statistics

This project serves as a research map to help gain insight and directions from past and current lines of inquiry in the social science aspects of rice farming. It also reveals the less covered research areas that need to be further pursued in the light of PhilRice objectives. Likewise, the statistics on rice farming will serve as a quick reference for people who may be interested in the Philippine rice situation.

Rice Policies of the Philippines: A Historico-critical Perspective

This project is a comprehensive review and analysis of various policies that have bearing on the rice industry since the administration of Pres. Manuel Roxas. It examined the impact of these policies on the rice economy as well as the efficacy of these political dispensations in addressing the problems of the industry. Furthermore, it contains recommendations on how the goverment can ammeliorate, if not solve, the perennial problem of rice shortage in the country.

Regional Rice Statistics Handbook

The publication of this handbook was an answer to the perceived problem of lack of historical information on rice. With this handbook, researchers, planners, and policy makers can well proceed in developing more responsive program for the Filipino rice farmers.

Analysis of Wholesale Price Adjustments to Rising and Falling Phases of Farm Price Changes

An analysis of the production costs and price margins from 1985 to 1992 showed that the glaring income disparity between traders and farmers is due to the big difference in their volume of business, and cannot be attributed to market power of traders. Figure 3 decomposes the retail price into major cost items: cost of production (33.03%), farmer margin (39.33%), wholesaler margin (18.25%), and retailer margin (9.39%).

TECHNOLOGY PROMOTION PROGRAM

On-farm Technology Demonstration

Under the Production Technology Component of the DA's Grains Production Enhancement Program (GPEP), a massive technology demonstration project exhibited the technology of producing about 5.0 t/ha of paddy rice. Yields in the demonstration sites exceeded provincial averages by 23-271%.

To control losses due to rice black bug in Palawan, the program identified the IR 13149-71-3-2 rice line and spearheaded its mass production and dispersal in Palawan.

The program also developed a post-training support project on "Sustainable Rice Production Program for NGOs in the Philippines" and piloted the location-specific technologies for rainfed areas and other adverse environments.

Training

The Season-long Rice Specialists' Training Course on Integrated Pest Management (RSTC-IPM) has contributed the following significant impacts:

- developed capability of local IPM trainers in implementing their provincial rice IPM programs.
- advocated the judicious use of insecticides, planting of resistant varieties, efficient application of organic and inorganic fertilizers, water management, and the conservation of natural enemies to manage pest populations
- reduced cost of rice production by as much as P1,000/ha through the IPM technology.
- reduced insecticide application by farmers from as much as 10 times per season to only 2 or 3 times, and sometimes even zero insecticide application.

The Training Program also institutionalized a network of rice trainers from the Department of Agriculture, state universities and colleges, local government units (LGUs), and non-government organizations (NGOs) which can readily respond to needs of farmers' cooperatives, and farmers' organizations in the regions/provinces.

The program dispersed superior varieties to local seed growers and farmers. Trained and informed farmers have learned to produce their seeds in their own farms through roguing and have become independent seed growers who are capable of producing the seed requirements of their fellow farmers in their area. PhilRice-trained and assisted NGOs, cooperatives, and farmers' cooperatives have increased their rice production by about 25 percent to as much as 100 percent.

Table 2.2 Participants of training programs, conferences, workshops, and technical briefings conducted from 1987-1995

TRAINING PARTICIPANTS	NUMBER
1. Trainors from the PhilRice R&D Network	1,411
2. Farmer-members of NGOs, Coops, & Organizations	48,342
3. Seed growers	2,625
4. Techo-demo farm cooperators and supervising technicians	2,033
5. Researchers, administrators, & extension officers of GOs and NGOs	2,080
6. IPM Trainors on study tour to PhilRice	350
7. FFS-IPM Participants on study tour to PhilRice	961
8. Season-long rice Specialists Training Course on IPM (RSTC-IPM) participants	141
9. Season-long RSTC-FFS IPM farmer participants	875
10. Training participants of specialized training courses	45
11. Researchers, extension officers and officials from foreign R&D organizations	360
12. GPEP program implementors	66
13. Researchers and agri. engineers in the GPEP Rice R&D Projects	1,429
14. Farmer-leaders and LGu officials on study tour to PhilRice	97
15. PhilRice field workers	
TOTAL	61,062

Development Communication

The Program assembled, synthesized, packaged, and distributed all available rice production technologies from PhilRice and various research institutions, and produced various media formats and prototypes. The "extension kit" prototype was also produced, and media materials were distributed to promote improved technologies

The development communication group also launched information and educational campaigns on rice production and initiated the publication of institutional scientific information.

Table 2.3 PhilRice publications (1990-95).

MATERIAL	TITLE	STATUS	TARGET BENEFICIARIES
Technoguides	Rice Production Technoguide	3,000	farmers/technicians
	Gabay sa Produksyon ng Palay	3,000	farmers/technicians
	Panagpatanur Ti Pagay*	3,000	farmers/technicians
Learning Manuals	Storyvideo Technique	1,000	researchers/trainers
	Storymaps Technique	1,000	researchers/trainers
	Photo-documentation	1,000	researchers/trainers
RiceTechnology Bulletins	Pagpaparami ng Purong Binhi sa Sariling Bukid	3,000	farmers/seedgrowers
	Released Rice Varieties	3,000	farmers/seedgrowers
	Paggawa ng Maligaya Rice Hull Stove	3,000	farmers/manufacturers
	PhilRice Drumseeder	3,000	farmers/manufacturers
	PhilRice Rototiller	3,000	farmers/manufacturers
	PhilRice Flourmill	3,000	farmers/cooperatives
	Rice-Food Products	3,000	farmers/cooperatives
	PhilRice-UAF Batch Dryer	3,000	farmers/cooperatives
	PhilRice Micromill	3,000	farmers/cooperatives
Books/Scientific Publications	Towards People Empowerment: GO-NGO Collaboration	1,500	policy makers
	Wild Rices in the Philippines	2,000	researchers/students
	Manual on Rice Genetic Resources, Conservation, and Genebank Management	2,000	researchers/students
	Manual on Paddy Fields Weeds of Rice in the Philippines	for printing	researchers/students
	Research Highlights '93	3,000	researchers/scientist
	Improving Rice Producitivity in the Philippines to Achieve Self-Sufficiency and Beyond:Issues, Challenges and Strategies	camera-ready	Policymakers

Institutional/ Promotional	PhilRice Newsletter (quarterly) PhilRice Annual Reports Workshop and annual review proceedings, PhilRice brochures, supplements, backgrounder, calendars, media releases, press kits

12.0 SUPPORT TO PROGRAM IMPLEMENTATION

12.1 Seed Production Support

The Seed Production group maintained, produced, processed, and distributed breeder and foundation seeds of all recommended and special quality rice varieties in the country.

Table 2.4 Quality seeds produced (tons), 1989-1995.

YEAR	BREEDER	FOUNDATION
1989	-	44.06
1990	-	118.64
1991	3.46	167.78
1992	3.76	190.36
1993	17.53	111.01
1994	17.10	119.38
1995 (Dry Season only)	14.06	56.91

The National Seed Production Network was organized, coordinated, and mobilized to produce enough foundation and registered seeds in all strategic rice areas of the country. PhilRice provided the seeds and initial cost of seed production amounting to P12,500 per hectare.

Table 2.5 Composition of the National Rice Seed Production Network.

MEMBERS	AREA (ha)	
Luzon	25	59
Visayas	19	43
Mindanao	16	39
Total	60	141

Established national and international linkages

- Organized the National Rice R&D Network
- Strengthened R&D capability of the network through research grants, laboratory and field equipment, support to station development, training/scholarships, and technical assistance
- Conducted collaborative cross-country programs with other international research and donor institutions

Planning and Monitoring

- Installed monthly and quarterly oral and written reporting system
- Conducted yearly National Rice R&D review and planning workshop involving all researchers and technology promotion specialists of the country.

Support Services

- Upgraded R&D capability through intensive PhilRice Staff Development Program
- Improved and mechanized management of experimental farms
- Improved dministrative and financial services support
- Infrastructure development
  - Construction of laboratory building, training dormitory and canteen, headhouse and screenhouses, field service building and drainage canals with a grant from the Japan International Cooperation Agency (JICA)
  - Construction of 20 3-bedroom housing units and 16 2-bedroom apartment units
  - Improvement of administration building in Midsayap Branch Station
  - Improvement of experimental farm and seed production building in San Mateo Branch Station
  - Improvement of research facilities of Los Banos Office
  - Renovation of Seed Processing Building and Motor Pool Building
  - Renovation of 25 existing housing units
  - Construction of perimeter fencing and irrigation canals

Contents

INTRODUCTION

PROBLEMS OF THE RICE INDUSTRY
- Declining rice yield and area planted to rice
- Problem soils and declining soil fertility
- Declining incentives in rice production
- Thin world market, volatile prices, and declining exportable surplus from traditional exporting countries
- Abnormal price increases penalize low income rural households more

AREAS THAT PHILRICE SHALL GIVE ATTENTION TO AS AN INSTITUTION
- Improved interdisciplinary collaboration
- Improved functional mechanisms to promote the generated technology

PROBLEMS ON RESEARCH AND TECHNOLOGY PROMOTION
- Inadequate database
- Unsatisfactory research and extension linkage
- Insufficient-specific technology transfer programs

POTENTIALS AND OPPORTUNITIES
- Self-sufficiency is politically desirable, economically viable, and technologically attainable
- Competitive advantage in favor of domestic production under general agreement on tariffs and trade

RECOMMENDED STRATEGIES
- Target group focused research and development
- Logically structured program goals and project objectives
- Strengthening policy advocacy

Chapter 3 Problems That Remain and Potentials and Opportunities

INTRODUCTION

Chapter 3 is about the problems that concern rice research and technology promotion. The chapter starts by discussing the problems of the rice industry before looking at the more detailed problems on rice research and technology promotion in the Philippines. The chapter ends by discussing the potentials and opportunities of the country's rice industry.

PROBLEMS OF THE RICE INDUSTRY

Declining rice yield and area planted to rice

Rice production somewhat declined after the mid-80s owing to the continued emergence of biological and socioeconomic problems. For instance, new strains and biotypes of rice pests have developed. Palay prices failed to catch up with the soaring cost of production. Regular occurrences of natural calamities such as floods and droughts compounded these problems. Reduced hectarage, poor maintenance of irrigation facilities, urbanization, and post harvest losses contributed to this decline (PhilRice, 1993).

Problem soils and declining soil fertility

There are 1.2 million hectares, about one-half of the national rice hectarage, are classified as problem soils. Of this total hectarage of problem soils, 600,000 hectares have adverse water and nutrient conditions, 100,000 hectares are saline-prone, 10,000 hectares are alkaline, 15,000 hectares have peat soil, and 500,00 have acid sulfate soil (PhilRice, 1993).

Declining incentives in rice production

Although nominal protection of domestic rice production has improved from 8 percent in 1980-1984 to 11 percent in 1985-1989 and 25 percent in 1990-1994, net effective protection has been eroded due to higher protection on tradeable inputs and overvaluation of exchange rate. This declining incentive implies bias against the rice sector in macro level resource allocation, and loss of benefits to farmers in the micro level.

Also, with the inability to defend the support price in the farm level, and lack of access to credit, processing, and storage facilities, farmers are pressed to sell their marketable surplus during harvest months when prices are low.

Thin world market, volatile prices, and declining exportable surplus from traditional exporting countries

The international rice market is very thin, with only less than 5 percent of production traded in the world market. One consequence of the thin market is volatile prices, particularly when countries enter the world market in the same side, either as an importer or exporter. Also, traditional exporters are facing their own population pressures, fast conversion of agricultural land into industrial uses, and competing non-agricultural uses of water, thus reducing their abilities to produce exportable surplus.

Abnormal price increases penalize low income rural households more

Breakdown in the monitoring system often results to inadequate and untimely importation that leads to abnormal price increase during the lean months. It does not benefit small farmers, grants abnormal profits to private traders, and penalizes low income rural households more. A one percent increase in the price of rice imposes a maximum equivalent tax of 0.17

AREAS THAT PHILRICE SHALL GIVE ATTENTION TO AS AN INSTITUTION

Improved interdisciplinary collaboration

Ecosystem-specific technology is different from location-specific technology. While ecosystem refers to rice-growing environment characterized by water regime (IRRI, 1990), location refers to a geographically defined area that is politically divided into municipalities, provinces, and regions. There are instances when a location is an area cutting across provincial and regional boundaries.

The Key Production Areas (KPAs) of the DA's Medium Term Agricultural Development Plan (MTADP) shall be considered as the primary target locations for technology generation in the medium term. Research in the suitability of generated technologies for the irrigated lowlands or KPAs shall be given emphasis.

Improved functional mechanisms to promote the generated technology

It is always assumed that a technology or a set of technologies should be mature to be ready for promotion for mass utilization. A functional mechanism is necessary to promote the technology on a practical application. A weak functional mechanism for technology promotion affects the technology generation and utilization process. For instance, the lack of vital information necessary to promote the technology for mass utilization will certainly affect the promotion of that technology.

PROBLEMS ON RESEARCH AND TECHNOLOGY PROMOTION

Inadequate database

An accurate database shall serve as the basis for planning and monitoring of research projects. The present data aggregation on rice is not adequate for research and technology promotion purposes. For instance, basic data on rice production are aggregated on a provincial and regional basis. This aggregation appears to be artificial, and is still inadequate for research planning and management, and policy formulation.

Inspite of several studies conducted on rice, there is no serious effort to compile and analyze all these studies that are essential to augment and strengthen the existing database. There is a need to establish long-term databases for rice research and development planning.

Unsatisfactory research and extension linkage

The primary mandate of PhilRice is to undertake research and development on rice. Extension that involves the promotion of technology through training and mass communication is the primary concern of the local government units, as provided for in the Local Government Code. Under this research and extension linkage, huge structural adjustments are still necessary. PhilRice shall improve its linkage with extension as a way of improving research performance. Extension shall give the necessary feedback to research to improve the system of generating technology.

Insufficient location-specific technology transfer programs

PhilRice shall define the priority rice-producing area that its research and technology promotion programs shall focus on. Projects shall be formulated to solve location-specific problems. Thus, generation and promotion of technologies are generally slow and inadequate at this time.

POTENTIALS AND OPPORTUNITIES

Self-sufficiency is politically desirable, economically viable, and technologically attainable

Being a staple food of practically all the 68 million Filipinos and main source of income of 11.5 million farmers and family dependents, self-sufficiency in rice is politically desirable. Being the main "wage-good" accounting for 13 percent weight in the Comic Price Index (CPI) and its backward and forward linkages in rural economies, self-sufficiency in rice is economically viable. The strongest argument for self-sufficiency in rice, however, is that it is achievable given the production potential of available production technology.

Competitive advantage in favor of domestic production under general agreement on tariffs and trade

It is projected that world price of rice will rise by 8 percent under the GATT. As a consequence, throughout 1995 to 2004, the domestic producer price of rice will be lower than the border or landed price of imported rice at 50 percent to the lowest income quartile in rural households but only 0.04 percent to the highest income quartile in urban households.

RECOMMENDED STRATEGIES

Target group focused research and development

PhilRice shall formulate its research projects and programs to serve specific target groups. PhilRice's mandate is not merely to increase production. The institute shall serve the Filipino rice farmers, most of whom belong to the low income and poverty group. On this basis, research projects shall serve the purpose of providing benefits to specific target groups.

Target groups shall be fully identified. For instance, they should not be merely identified as lowland rainfed farmers and upland rice farmers. Target groups could be located, their numbers could be identified, and they could be demographically characterized. The framework of the research projects, will be designed for specific group.

Logically structured program goals and project objectives

One way of ensuring a multidisciplinary collaboration is to impose corrective measures in the formulation of program goals and project objectives. Programs and projects shall be carefully planned and their relationship with one another shall be structured in a logical perspective.

Strengthening policy advocacy

The country's rice industry requires policy reforms. PhilRice contribution to the much-needed policy reforms shall be strengthened.

Contents

INTRODUCTION

VISION

MISSION

MANDATE

GOAL AND OBJECTIVES
- Goal
- Immediate Objectives
- Results
- Projects

CORPORATE STRATEGIES
- Institutional
- Program Strategy
- Operational Strategy

INDICATORS OF CORPORATE ACHIEVEMENT

IMPORTANT ASSUMPTIONS
- Improved national government support to the national rice research and development program
- Improved partnership with local government units (LGUs)
- Improved farmers' participation
- Improved private sector collaboration

Chapter 4 The Operational Planning Framework

INTRODUCTION

Operational planning aims to translate the vision of PhilRice into action. The operational planning framework contains fundamental information explaining how to operationalize the vision. In other words, the framework shall contain information on how the PhilRice research and technology promotion programs shall contribute in attaining the Institute's corporate goals and objectives.

This chapter starts with the formulation of the corporate goals and objectives. These objectives shall be the bases in formulating the corporate strategies. Following the strategy formulation is the description of indicators as measures of attaining the objectives. The chapter then ends with a brief section on important assumptions that are essential to realize the objectives.

VISION

PhilRice as a key player in building a self-sufficient and competitive rice economy is the vision of PhilRice.

MISSION

PhilRice, a government cooperation actively participating in sustaining rice self-sufficiency and in building a competitive rice economy through research, technology promotion, and policy advocacy.

MANDATE

PhilRice shall lead, unify, and strengthen the manpower capabilities and improve the facilities of agencies involved in the national rice research and development program. PhilRice shall be a vital force in attaining and sustaining the country's goal of self-sufficiency in rice and in promoting greater access of farmers to agricultural technology.

GOAL AND OBJECTIVES

Goal

The goal refers to the higher level needed change to which PhilRice shall contribute. The goal of PhilRice is:

To contribute in sustaining rice self-sufficiency through a competitive rice industry with emphasis on the key production areas (KPAs) for rice, by the year 2000.

There are two aspects of the goal: the achievement of self-sufficiency itself and the sustainability of a globally competitive rice industry . Self-sufficiency shall aim at the higher goals of food security, self-reliance, and farmer welfare. Sustainability implies the use of suitable and productive technologies, technical efficiency, financial profitability, and due regard to the integrity of the environment. Competitiveness can be attained by reducing the cost of production, improving quality, and increasing yield.

The goal is not a sole concern of PhilRice. The institute has only the mandate to conduct research and deliver technology promotion services. Primary extension support, credit, irrigation infrastructure, and marketing support, among other things, are the mandates of other agencies. In other words, national government agencies and respective agencies within the DA organization, and their counterparts in the local government units (LGUs), shall also contribute in order to attain the common goal.

The above goal is in line with the vision of PhilRice for the country. This vision is that of *a self-sufficient and competitive rice economy.*

Immediate Objectives

The immediate objectives refer to the intended effect PhilRice as a whole wants to accomplish as its contribution in attaining the vision. By the end of the year 2000, the contribution of the institute toward the attainment of the goal of sustained self-sufficiency in rice shall be through the accomplishment of the following immediate objectives:

a. Generate location-specific rice and rice-based technologies,

b. Promote the use of location-specific rice and rice-based technologies with emphasis on the KPAs for rice,

c. Advocate specific policies that enhance efficiency and improve equity,

d. Strengthen national rice research and development capability.

Results

The results are the major outputs that PhilRice shall accomplish, which are immediately in line with achieving the immediate objective. The results shall be as follows:

a. Location-specific rice and rice-based technologies

i) Comprehensive data and information bases
ii) Research to support location-specific technologies
iii) Technologies in KPAs for rice

b. Promoted location-specific rice and rice-based technologies with emphasis on the KPAs for rice,

i) Promote technologies in KPAs
ii) Strategies for technology management
iii) Collaborate with other agencies

c. Advocate specific policies that enhnace efficiency and improve equity

i) Conduct broad socio-economic research with strong policy relevancy
ii) Conduct policy-specific research
iii) Propose policy alternatives to support competitiveness and self-sufficiency
iv) Advocate policies

d. Strengthened national rice research and development capability

i) Upgrade research facilities of the national rice research and development network
ii) Strengthen human resource capability of the national rice research and development network
iii) Improve planning, monitoring, and evaluation of research and development projects
iv) Improve utilization of information technology for data management and information exchange among network members
v) Improve administrative and finance system support to research and development

Projects

The projects are the fundamental inputs that are necessary to attain the desired results. The projects are further broken down into specific studies that contribute toward the attainment of the overall objective of a project (See Chapter 5, Schedule of Implementation, Monitoring and Evaluation). The projects that PhilRice shall carry out, which are in line with attaining the desired results, are listed in *Table 4.1*.

Table 4.1 List of PhilRice projects by result area.

IMMEDIATE OBJECTIVE /RESULT AREA	PROJECT
a. Generate location-specific rice and rice-based technologies	
1.Comprehensive data and information bases	Soil fertility database project
	Generation of Information for Intensive cropping technology
	Database project: profiling of rice pest and their natural enemies under lowland conditions
	Data management of rice-based farming systems technology

Table 4.1 List of PhilRice projects by result area.

IMMEDIATE OBJECTIVE /RESULT AREA	PROJECT
	Rice properties that enhance the quality of rice food products
	Rationalization of screening for rice grain quality in the PhilRice breeding program
	Chemical and sensory evaluation of rice aroma
	Rice grain quality in support of varietal development
	Database projects: Social Science and Policy Research
	a. Regular monitoring of rice-based farm households in strategic rice production areas
	b. Sociotechnological weather stations for the rice economy
	c. Statistical series of the rice economy
	Data management of rice-based farming systems technologies
2. Research to support location-specific technologies	National Cooperative Testing (NCT) for varietal development
	Utilization of biotechnology and other nonconventional breeding methods
	Specialized rice breeding projects:
	a. Development of breeding lines for improved physiological and agronomic traits
	b. Development of breeding lines for improved grain quality
	c. Development of breeding lines for drought tolerance
	d. Development of breeding lines for improved nitrogen use efficiency

IMMEDIATE OBJECTIVE /RESULT AREA	PROJECT
	e. Development of breeding lines for tungro resistance
	f. Development of breeding lines for bacterial leaf blight and blast resistance
	g. Development of breeding lines for brown planthopper and stemborer resistance
	Cultural practices for efficient and high yield rice production
	Development of rice varieties for fragile environments
	Systems analysis and simulation
	Integration of component technology and packaging of technology
	Biological control of major rice pests in rice-based ecosystems
	Impact of pesticides on rice anthropods in rice-based ecosystem
	Enhancement of natural control mechanisms in rice-based ecosystems
	Management of weeds in rice-based ecosystems
	Disease management in rice-based ecosystems
	Tungro virus national research and development
	Development of local engine
	Development and improvement of farm machinery and equipment

IMMEDIATE OBJECTIVE /RESULT AREA	PROJECT
3. Develop technologies with emphasis on KPAs for rice	Irrigated rice development
	Cultural practices for efficient and high yield rice production
	Integrated nutrient management in irrigated lowland rice
	Ecology and management of rice planthoppers and leafhoppers under lowland conditions
	Ecology and management of insect pests in "hot spot" areas
	Modern rice varieties for traditional food products
	Development of nontraditional rice food products
	Ecology and management of rice stemborers under lowland condition
	Ecology and management of rice planthoppers and leafhoppers under lowland conditions
	Derivative socioeconomic studies a. Socioeconomic and technological profile of strategic rice areas b. Socioeconomic evaluation of rice-based farming in the Philippines
b. Promoted location-specific rice and rice-based technologies, with emphasis on the KPAs for rice	
1. Promote technologies in KPAs	Packaging and promotion of mature technologies through communication media
	Packaging and promotion of educational and scientific communication materials
	Demonstration of hybrid rice technology

IMMEDIATE OBJECTIVE /RESULT AREA	PROJECT
	TPD Demonstration and Training Farm
	Rainfed lowland technology demonstration
	Rice seed production technology for seed growers
	Technology adaptation through on- farm demonstration (irrigated and rainfed lowland rice-based farming systems)
	GPEP R&D Projects
	Commercialization of PhilRice products, farm implements, and equipment
2. Develop strategies for technology management	Institutional support communication
	Institutional communication and public information materials
	Communication research
3. Collaborate with other agencies	Inteagency collaborative research (Planting and Fertilizer Management Program) Monitoring and evaluation of GPEP R&D projects
	Reversing the declining trend in productivity (PhilRice-IRRI-SDC Mega Project)
c. Advocate policy for farmers	
1. Conduct policy-specific research	Public policy and the rice economy
2. Propose policy alternatives to support competitiveness and self-sufficiency	Economic evaluation of rice-based agribusiness industries
3. Advocate policies	

IMMEDIATE OBJECTIVE /RESULT AREA	PROJECT
d. Strengthen national rice research and development capability	
1. Upgrade research facilities of the national rice research and development network	Equipment support to the network
2. Strengthen human resource capability of the research and development network	Human resource development support to the network
3. Improve planning, monitoring, and evaluation of research and development projects	Establish impact assessment procedures
	Strengthen management information system
	Incorporate socioeconomic dimensions in conducting research and development projects
4. Improve utilization of information network technology for data management and information exchange among network members	Establishment and maintenance of local area for PhilRice
	Establishment of access to the INTERNET and other local and global networks
	Assistance to network members in the acquisition and utilization of IT resources
	Establishment and maintenance of information data bases for project planning, management, and monitoring and evaluation
5. Improve administrative and finance system to research and development	Improve accounting and budgeting procedures
	Improve transportation and communications facilities
	Adopt revised auditing manual for research organization (RAMRO)
	Operationalize the human resource development plan
	Improve staff recruitment system
	Improve pay standard and incentive schemes
	Improve records management system

CORPORATE STRATEGIES

Corporate strategies refer to the tactics that PhilRice shall employ in achieving its goal and objectives. A hierarchy of component strategies breaks down the corporate strategies as follows: a) Institutional, b) Program, and c) Operational.

Institutional

a. The key production area (KPA) approach to rice research and technology promotion

The Key Production Area approach of the Department of Agriculture (DA) identifies certain priority areas best suited for specific products based on agro-climatic suitability and availability of markets for those products. As a banner program of the DA that is geared toward rice self-sufficiency, the Grains Production Enhancement Program (GPEP) focuses on rice-producing provinces that are predominantly irrigated. PhilRice research and development program's immediate strategy is to support rice production in identified KPAs for rice.

For research and technology promotion purposes, PhilRice defines the KPAs in the Philippines as the country's major rice-producing areas. They are currently and potentially important rice-producing areas, geographically contiguous and thus usually cut across provincial and regional boundaries. KPAs have general homogeneity in terms of physical features such as river systems, watersheds, soil types, agroclimate, and farming environment such as farming systems, technology, and markets. The areas are strategic because of their locations relative to consuming areas, current and potential performance as supply sources and thus of strategic importance to rice self-sufficiency.

Although PhilRice shall support GPEP and shall give attention to favorable irrigated areas, the institute shall continue to carry out research and technology promotion projects for rainfed lowland areas over the medium and long-term period.

Table 4.2 shows the current major rice producing areas of the Philippines. Table 4.3 shows the potential rice-producing areas. Table 4.4 shows the provinces covered by the GPEP.

PhilRice research and technology promotion strategy using the KPA approach, therefore, is in support of the GPEP. Figure 4.1 shows the KPAs for rice research and technology promotion.

Figure 4.1 - Key Production Areas (KPAs) for Rice in the Philippines

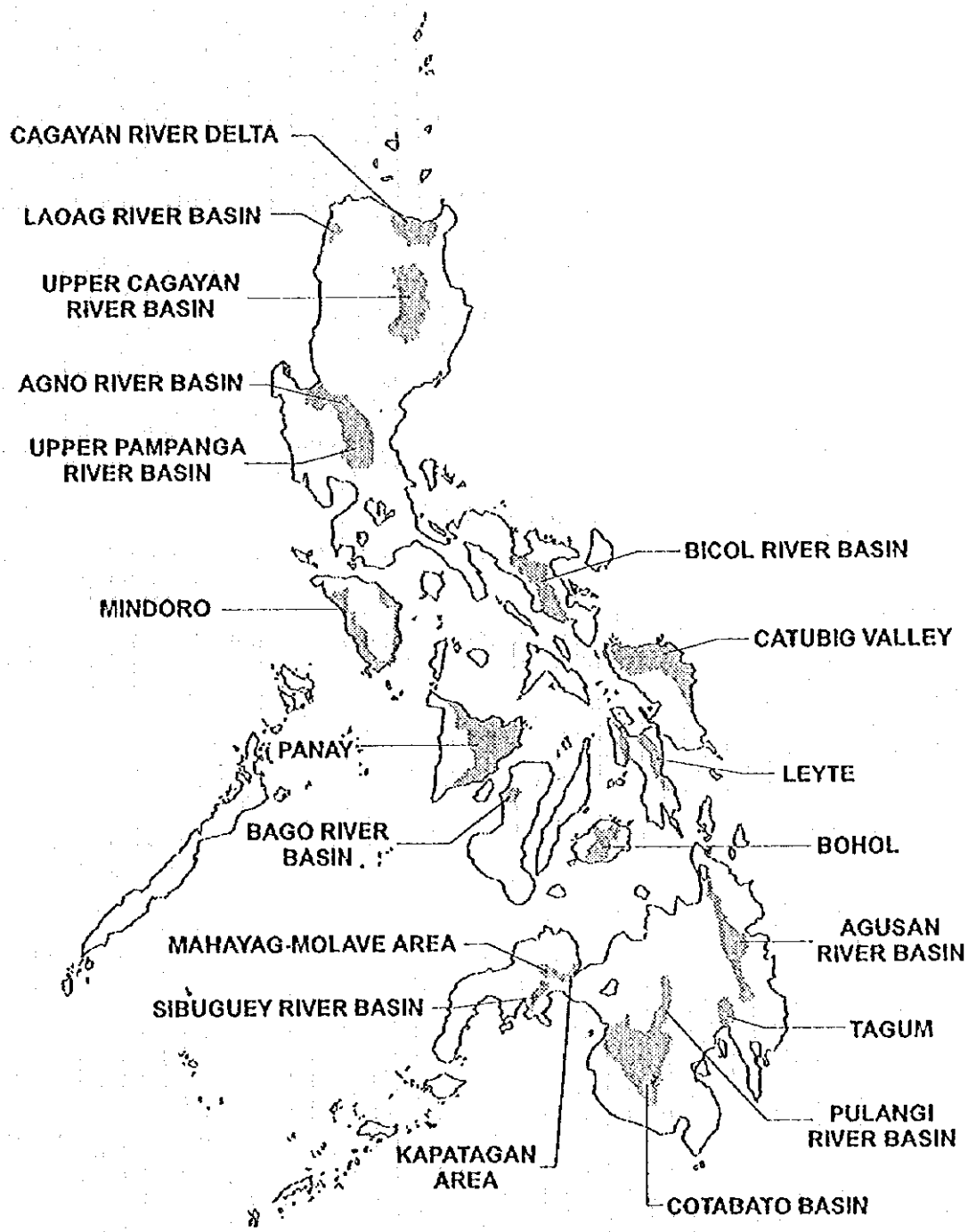


Table 4.2 Current major rice areas of the Philippines

Key Production Area	Province	Justification
1.0 Luzon		
Ilocos Norte	Ilocos Norte	For rice self-sufficiency in the Ilocos Region
Pangasinan	Pangasinan	Rice surplus to supply Metro Manila
Downstream Cagayan	Cagayan	Rice surplus to supply Metro Manila
West Isabela	Isabela	Rice surplus to supply Metro Manila
Nueva Vizcaya	Nueva Vizcaya	For self-sufficiency in Nueva Vizcaya
Central Luzon	Nueva Ecija Bulacan	Rice surplus to supply Metro Manila
Bicol River Basin	Camarines Sur Albay	For self-sufficiency in the Bicol Region
2.0 Mindoro Island		
Eastern Mindoro Oriental	Mindoro Oriental	Rice surplus to supply Southern Luzon provinces and Metro Manila
Western Mindoro Occidental	Mindoro Occidental	Rice surplus to supply Southern Luzon provinces and Metro Manila
3.0 Leyte Island		
Leyte	Leyte	Rice self-sufficiency in Leyte
4.0 Panay Island		
Iloilo	Iloilo	Rice surplus to supply deficit areas in the Visayas
5.0 Negros Island		
Negros Occidental	Negros Occidental	Rice self-sufficiency in Negros Island

Key Production Area	Province	Justification
6.0 Mindanao		
Bukidnon	Bukidnon	Rice surplus to supply rice-deficit provinces in Northern Mindanao
Cotabato Rice	North Cotabato Basin Maguindanao Sultan Kudarat	Rice surplus to supply South Cotabato rice-deficit provinces of Davao
Davao del Norte	Davao del Norte	Contribute to supply the demand of Davao provinces

Table 4.3 Potential rice areas of the Philippines

Key Production Area	Province	Justification
1.0 Luzon		
Aurora	Aurora	Rice self-sufficiency in Aurora
2.0 Samar		
Northern Samar	Northern Samar	Rice self-sufficiency in Northern Samar
3.0 Bohol		
Bohol	Bohol	Rice surplus to supply Cebu
4.0 Mindanao		
Eastern Lanao	Lanao del Sur Lake	For rice self-sufficiency in Lanao
Kapatagan Area	Lanao del Norte	For rice self-sufficiency in Lanao
Zamboanga del Sur	Zamboanga del Sur	For rice self-sufficiency in Zamboanga
Agusan	Agusan	Rice surplus to supply rice-deficit provinces in Northern Mindanao

Apart from the current and projected major rice producing areas, there are other areas that shall still be considered for rice research and development. These areas are as follows:

a. Favorable upland rice areas (Batangas, Sorsogon, North Cotabato, South Cotabato, Zamboanga del Sur, Antique, Isabela, Cagayan)
b. The Cordilleras
c. Laguna (to study/document intensive monoculture system)

Table 4.4 Key Production Areas (KPAs) under the GPEP by region and by province

Region	Province
CAR	Kalinga Apayao
1	Pangasinan, Ilocos Norte La Union, Ilocos Sur
2	Cagayan, Isabela, Nueva Viscaya, Quirino
3	Bataan, Bulacan, Nueva Ecija Pampanga, Tarlac, Zambales
4	Laguna, Mindoro Occidental, Mindoro Oriental, Quezon, Palawan, Aurora
5	Northern Samar, Albay, Camarines Sur Masbate, Sorsogon, Camarines Norte
6	Iloilo, Negros Occidental, Antique, Aklan, Capiz
7	Bohol, Negros Oriental
8	Biliran, Leyte/Southern Leyte, Northern Samar
9	Zamboanga del Sur, Zamboanga del Norte Zamboanga City
10	Bukidnon, Agusan del Norte Agusan del Sur, Misamis Occidental
11	Davao del Norte, Davao del Sur Davao Oriental, South Cotabato and Satanggani, Surigao del Sur
12	North Cotabato, Sultan Kudarat Lanao del Norte, ARMM Maguindanao

b. Strengthening Planning, Monitoring and Evaluation

Planning, monitoring, and evaluation are areas of research management that require strengthening within PhilRice. An efficient system of planning, monitoring, and evaluation is a fundamental tool in order to attain the research and development objectives.

c. Strengthening the National Rice Research and Development Network

Sharing of resources and expertise in the national rice research and development program shall only take place under a strong national rice research and development network.

d. Strengthening the Organizational Capability of the Branch Stations

The branch stations shall not be left out as largely administrative units supporting a centrally directed rice research and development program. Rather, PhilRice shall consider these stations as independent units attached to the PhilRice central experiment station. The stations have their own agenda of serving their respective service rice-growing areas.

e. Organizational restructuring

The organizational strategy shall call for minor reorganizations. Within the Central Experiment Station, the institute shall strengthen planning and multidisciplinary program coordination. Similarly, corporate communication shall aim at promoting the accomplishments of PhilRice and the national rice research and development network to target groups within the country's rice industry.

PhilRice shall strengthen its branch stations. This strategy aims to prepare the branch stations to undertake adaptive research suited to their respective areas.

Program Strategy

Each program thrust has its own contribution in attaining the goal of PhilRice.

a. Rice Varietal Improvement Program

The program shall help to ensure sufficient and efficient rice production by developing stable, high-yielding, and pest-resistant varieties for irrigated lowland and fragile ecosystems. In particular, the program shall gear itself in a) conserving and fully utilizing rice genetic resources and b) developing, testing, and releasing varieties that are stable and high yielding, resistant to pests, tolerant to abiotic stresses, of suitable maturity, of good grain quality, and suitable for industrial processing.

b. Planting and Fertilizer Management Program

The program shall focus on increasing the knowledge on cultural practices for high yield rice production. Specifically, the program shall formulate location-specific fertilizer recommendation, generate more information on intensive cropping technology, integrate component technology, and package appropriate technology for high productivity.

c. Integrated Pest Management Program

The research agenda shall adopt and promote the Integrated Pest Management (IPM) perspective which: a) views the rice farm as an ecosystem emphasizing the need to understand pests and ecologies in both crop and non-crop areas, b) promotes and maintains the essential role of naturally occurring biological control mechanisms inherent in well-established tropical agroecosystems, c) encourages the healthy blend of host plant resistance and cultural practices that enhance the effectiveness of naturally occurring biological controls, d) adopts a farm-need driven research orientation, f) fosters and adopts an interdisciplinary-oriented approach, f) strengthens farmers' capability for decision-making, and g) promotes and develops community-oriented pest management.

d. Rice-Based Farming Systems Program

The program shall seek to develop sustainable cropping systems and efficient management practices to expand income opportunities from rice and rice-based crops.

e. Rice Engineering and Mechanization Program

The program shall seek to develop farm equipment and related technologies that increase the efficiency of the farm operations, reduce postharvest losses, and add value to rice and its by-products. The program shall give particular attention to the following areas: a) the development of efficient and input-saving equipment for rice production, b) the development and promotion of appropriate postharvest equipment, c) the development and adaptation of appropriate processing equipment, and d) the promotion of the use of rice by-products, particularly rice hull, for energy saving and environmental preservation purposes.

f. Rice Chemistry and Food Science Program

The program shall support the rice varietal improvement program by improving the grain quality evaluation procedure. The program shall also focus on the development of rice food products and its by-products for commercialization.

g. Social Science and Policy Research Program

The program shall facilitate the development of the rice economy through proactive social science and policy research. These research areas include a) the evaluation for efficiency and opportunities on the off- and non-farm agribusiness sectors, b) publication and dissemination of research findings, c) rationalized integrative and multidisciplinary framework for rice R& D effort prioritization, and d) active efforts to influence public policy on rice at the national and local levels.

g. Technology Promotion Program

The program shall concentrate on the promotion of technologies for mass utilization. The program shall place emphasis on the development of a) integrated promotion package using communications, training, and on-farm technology demonstration, and in b) the development of extension strategies for adoption by government and nongovernment agencies.

i. Seed Production and Health

This program shall continue the production of breeder and foundation seeds, improve seed processing and distribution, establish and use seed health facilities to ensure that the seeds to be distributed all over the country will be of high quality. Other activities are: conduct studies on seed production, processing, storage, and health.

Operational Strategy

a. Participatory research management in KPAs

PhilRice shall bring down multidisciplinary research effort to the rice farming communities, which are the basic geographical units of identifying the problems on rice research and development. A multidisciplinary research undertaking in the rice farming communities shall entail the application of a participatory research management approach. This approach shall involve the identification of research problems, and implementation and evaluation of research projects with the participation of the communities.

PhilRice shall use the results of research done in the rice farming communities for the formulation of larger research projects, and formulation of extension strategies that will cover wider KPAs.

b. Project type approach to research and development

The project type approach to research and development aims to develop and promote technologies to target farming communities by way of a project. A project is a concrete structure that can translate specific research and development activities into results that will lead to the goal of solving a particular research and development problem. It has a definite time frame of implementation, and a more defined amount of human, physical, and financial resources to be used. Furthermore, it must have an appropriate organizational structure that will carry out the activities. Thus, at the end of the project, the following conditions shall exist: a) the problem is solved, and b) a specific technology for specific target group has been developed and promoted.

INDICATORS OF CORPORATE ACHIEVEMENT

The indicators of corporate achievements are the quantitative ways of measuring the objectives and the qualitative ways of describing the objectives. The indicators of achievements that correspond to the hierarchy of objectives are as follows:

Table 4.5 Indicators of Corporate Achievement

HIERARCHY OF OBJECTIVES	INDICATOR OF ACHIEVEMENT
GOAL To contribute in achieving and sustaining rice self-sufficiency through a competitive rice industry with emphasis on the Key Production Areas (KPAs) for rice by the year 2000	Rice production increased to 12 million metric tons by the year 2000, with the following conditions: 1. Yield a. Irrigated lowland - 12 tons per year b. Rainfed lowland - 4 tons per year c. Upland - 2 tons per year 2. Cost of rice production globally competitive up to marketing of milled rice to the consumers
IMMEDIATE OBJECTIVE A. Generate location specific rice and rice-based technologies	Important rice production and post production technologies generated: a. Improved varieties b. Improved direct seeding methods c. Improved water management d. Improved fertilizer management e. Integrated pest management f. Improved harvester g. Improved postharvest handling methods
B. Promote technologies suitable to the KPAs for rice	Technologies suitable for KPAs promoted a. Varieties b. Fertilizer management (organic and inorganic) c. Farm machinery d. Commercialized rice food products
C. Advocate specific policies that enhance efficiency and improve quality	Policies for improved rice pricing and marketing studied and advocated. Policies to promote greater access to production inputs (e.g., credit) of resource poor farmers studied and advocated. Policies that promote efficiency and competitiveness formulated. Policies to correct policy-induced loss of incentives in rice production proposed. Policies to promote productivity-enhancing initiatives proposed.

D. Strengthen national rice research and development capability	Facilities of the national rice research and development network upgraded Human resource capability of PhilRice and the network strengthened Planning, monitoring, and evaluation of research and development projects strengthened Utilization of information technology resources of PhilRice and the R&D network Administrative and financial support system to research and development improved
RESULT A1. Establish data and information bases	Major data and information bases established in KPAs a. Production technology database b. Pest profile c. Rice socioeconomic weather station d. Farming systems database
A2. Conduct research to support location-specific technologies	National varietal testing improved Biotechnology applied in rice breeding Breeding lines of rice improved Cultural practices for efficient rice cultivation improved Pest management methods for major rice pests improved Grains quality evaluation procedures improved Farm machineries and equipment improved
A3. Develop technologies in KPAs	Technologies generated through interdisciplinary research by 1998 a. Location-specific varieties b. Improved direct seeding method c. Improved integrated pest management practices d. Improved rice-based farming systems practices e. Improved production and postharvest equipment f. Production of quality seeds improved

B1. Promote technologies in KPAs	Technologies promoted in KPAs a. Improved varieties b. Hybrid rice b. Fertilizer recommendation c. Integrated pest management practices d. Power tiller e. Stripper harvester
B2. Develop strategies for technology management	Strategies for technology management applied by LGUs, NGOs, and farmers' association a. Improved training methods b. Improved communication support
B3. Collaborate with other agencies	Research collaboration with IRRI, DA, SCUs, NGOs, and other international agencies strengthened
C1. Conduct rice policy research	Researches on public policy and the rice economy conducted
C2. Formulate policy alternatives to support competitiveness and self-sufficiency	The rice-based economic industries evaluated
C3. Advocate specific policies that enhance efficiency and improve quality	Rice pricing, marketing policies favored farmers
D1. Upgrade research facilities of national rice research and development network	Farm equipment and laboratory facilities provided to network members Technical and financial support to network members in the development of experimental and seed farms provided
D2. Strengthen human resource capability of research and development network	Scholarships and training granted to network
D3. Improve planning, monitoring, and evaluation of research and development projects	Quality of project proposals improved Project monitoring and evaluation system improved
D4 Improved administrative and finance system to research and development	Administrative systems and procedures operationalized Computer and communication network operationalized Accounting and budgeting systems improved

IMPORTANT ASSUMPTIONS

Assumptions are the sets of conditions necessary to attain the set goal and objectives of PhilRice. These conditions shall exist and shall be considered in the design and implementation of research and development projects. These assumptions are as follows:

Improved national government support to the national rice research and development program

The policy environment in which the national rice research and development program is embedded shall be improved. Budgetary allocation to rice research and development shall be increased.

Improved partnership with local government units (LGUs)

PhilRice shall improve its partnership with the LGUs in order to strengthen the institute's research linkage with extension. This partnership shall ensure that the product of research are promoted or moved smoothly to the farmers.

Improved farmers' participation

The identification of research problems shall involve the participation of farmers. In this regard, consultation with farmers shall be ensured in the research and development process.

Improved private sector collaboration

The collaboration with the private sector, especially in the commercialization of technologies, is very vital. The private sector makes the technology readily available to farmers. The private sector also controls the marketing of rice. On this basis, collaboration with the private sector is very vital in carrying out rice research and development agenda.

Contents

INTRODUCTION

IMPLEMENTATION SCHEDULE
Schedule of Program Activities

MONITORING AND EVALUATION SCHEDULE
Regular Project Monitoring
Mid-term Evaluation
Impact Evaluation

Chapter 5 Schedule of Project Implementation, Monitoring, and Evaluation

INTRODUCTION

The detailed translation of corporate objectives into specific corporate activities follows the operational planning framework (Chapter 3). This chapter on schedule of implementation, monitoring, and evaluation begins by identifying research activities. After identifying research activities, the yearly phasing of activities follows. The chapter identifies the divisions and stations within PhilRice and cooperating network member stations, which are responsible for carrying out the activities. Detailed monitoring and evaluation activities follow the schedule of implementation. The chapter then presents the activities concerning administrative and technical support to program implementation. Finally, the chapter lays down PhilRice's monitoring and evaluation plan.

Chapter 4 is most useful in the preparation of the annual plan of the institute. The chapter contains basic information in the preparation of the annual plan.

IMPLEMENTATION SCHEDULE

Schedule of Program Activities

a. Rice Varietal Improvement

For the past eight years, PhilRice has implemented the Rice Varietal Improvement Program. To date, 14 PSB varieties have been released. Four of these varieties were developed by PhilRice Maligaya, 3 by PhilRice UPLB, and 7 by IRRI. Nine of these varieties are for irrigated ecosystem, 4 for rainfed lowland rice ecosystem, and 1 for upland rice ecosystem. The average yield of the irrigated rice varieties released is 5.1 t/ha, that of rainfed lowland rice is 3.3 t/ha and the upland rice variety is 2.5 t/ha. This average yield is based on a multilocation trial all over the Philippines. Under more favorable environments, the irrigated rice varieties could yield as high as 9 t/ha. These accomplishments of the Rice Varietal Improvement Program have contributed substantially to the rice production in the Philippines, especially in maintaining food security in the country. The average annual rice production from 1984 to 1994 was 9.05 million metric tons, much higher than in previous periods.

As we move on into the future, we need to continue developing rice varieties that will meet our immediate and future needs in rice. The high population growth rate (2.5% per year), high per capita consumption (91.13 kg/yr), and declining area planted to rice (-1.83% growth rate for 1990-92) remain as the main sources of pressure for us to seek higher rice yields in favorable rice environments and to optimize the utilization of less favorable rice ecosystems. The emerging world economic environment is also exerting upon us to be more efficient and globally competitive in our rice production system. In addition to seeking higher yield, we need to develop rice varieties that we can use for other purposes and which have high export potential.

Table 5.1 Schedule of Implementation, RVIP.

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
RICE GERMPLASM COLLECTION, EVALUATION, CONSERVATION AND DOCUMENTATION						
DEVELOPMENT OF IRRIGATED LOWLAND RICE VARIETIES						
DEVELOPMENT OF NEW PLANT TYPE						
DEVELOPMENT OF F1 HYBRIDS AND RELATED TECHNOLOGIES						
DEVELOPMENT OF RICE VARIETIES FOR SPECIAL PURPOSES						
DEVELOPMENT OF RAINFED LOWLAND RICE VARIETIES						
DEVELOPMENT OF LOCATION SPECIFIC UPLAND VARIETIES						
DEVELOPMENT OF LOWLAND VARIETIES ADAPTED TO ADVERSE SOIL CONDITIONS						
DEVELOPMENT OF RICE VARIETIES FOR THE COOL ELEVATED AREAS						
UTILIZATION OF MOLECULAR MARKER TECHNOLOGY FOR RICE IMPROVEMENT						
UTILIZATION OF IN VITRO TECHNIQUES FOR RICE IMPROVEMENT						
TRANSFER OF DESIRABLE RICE GENES FROM WILD SPECIES THROUGH WIDE HYBRIDIZATION)						
GENERATION OF GENETIC VARIABILITY USING PHYSICAL MUTAGENESIS						
GENETIC TRANSFORMATION						
NATIONAL COOPERATIVE TEST - YIELD TRIAL						
NATIONAL COOPERATIVE TEST - DISEASE RESISTANCE						

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
NATIONAL COOPERATIVE TEST - INSECT RESISTANCE						
NATIONAL COOPERATIVE TEST - GRAIN QUALITY TEST						
BASIC SEED PRODUCTION						
DEVELOPMENT OF BREEDING LINES FOR TUNGRO RESISTANCE						
DEVELOPMENT OF BREEDING LINES FOR BACTERIAL LEAF BLIGHT AND BLAST RESISTANCE						
SCREENING OF LINES OR SELECTIONS FOR RESISTANCE TO MAJOR INSECT PESTS						

b. Planting and Fertilizer Management

The need to increase food production in the Philippines arises from high population growth with limited and decreasing agricultural land. Increased agricultural productivity of our existing land comes from a combination of many factors, such as introduction of new improved varieties, effective control of weeds, insect pests, and diseases, cultural practices such as effective water use, soil improvement, and increased use of fertilizers. Of these factors, fertilizers have so far accounted for 50% of the increase in crop yields. However, application of high rates of fertilizers on a long term causes environmental deterioration such as nitrate leaching into our drinking water and the increased concentration of nitrous oxide in the atmosphere. The use of intensive cropping has increased rice production but later on resulted in a gradual decline in essential micronutrients and grain yields. Thus, the use of organic fertilizers is advocated for crop production in such a way that the combination of inorganic and organic fertilizers or the transition from inorganic to organic fertilizers will improve the quantity and quality of crop yields and eventually improve the income of our farmers

Table 5.2 Schedule of Implementation, PFMP.

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
RICE-SOIL RESOURCES INVENTORY AND EVALUATION (SOIL CHARACTERIZATION AND EVALUATION)						
REVERSING TRENDS OF DECLINING PRODUCTIVITY IN INTENSIVE IRRIGATED RICE SYSTEMS						

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
IDENTIFYING CONSTRAINTS OTHER THAN NITROGEN AVAILABILITY LIMITING YIELD IN MAJOR RICE SOILS WITHIN SRAs						
INVESTIGATING EFFECT OF SEED QUALITY AND SEEDING VIGOR TO YIELD						
MANAGEMENT OF RAINFED LOWLAND RICE						
ASSESSMENT AND AMELIORATION OF PROBLEM SOILS						
CROP ESTABLISHMENT FOR DIRECT SEEDED AND TRANSPLANTED RICE (CROP ESTABLISHMENT)						
INTEGRATED NUTRIENT MANAGEMENT IN IRRIGATED LOWLAND RICE						
WATER MANAGEMENT FOR INCREASING RICE PRODUCTION						
PHYSICAL AND CHEMICAL ANALYSIS OF SOIL AND PLANT (SOIL FERTILITY ASSESSMENT FOR FERTILIZER RECOMMENDATION						
SYSTEMS ANALYSIS AND SIMULATION						
PACKAGING OF COMPONENT TECHNOLOGY						
CHARACTERIZATION OF TECHNOLOGY EXTRAPOLATION DOMAIN						
IDENTIFICATION OF FUNCTIONAL NETWORK AND STRATEGIES FOR TECHNOLOGY EVALUATION AND VERIFICATION						
TECHNOLOGY EVALUATION AND VERIFICATION						
METHANE EMISSION MEASUREMENT FROM IRRIGATED LOWLAND RICE FIELDS						
IMPROVEMENT OF EFFICIENCY AND ENVIRONMENTAL IMPACT OF NITROGEN FERTILIZERS						

a. *Integrated pest management*

The past 10 to 15 years of research and development efforts in pest management have been witness to the rapid, often incoherent and even conflicting, changing concepts of Integrated Pest Management (IPM) in the Philippines. A more astute assessment of the evolving process of thought patterns and model building is expressed by Levin (1986) in no uncertain terms: "The development of IPM is not a smooth unfolding of knowledge and technique but rather an uneven, erratic course, the result of powerful, encouraging, and retarding influences that vary in space and time and that bring people together in complex adversarial and cooperative relations. One symptom is a diversity of definitions of IPM."

Since this diversity of IPM definitions largely rests on the scientific orientation of contending researchers, ranging from a strictly reductionist to a holistic perspective or a healthy blend of both, the unmistakable inclination of current agricultural research toward the ecosystem view of farming systems has increasingly facilitated the emergence of an ecology-based IPM paradigm. Not surprisingly, this IPM concept emerged and developed in rice agroecosystems and is currently increasing acceptance by farmers. A similar development remains to be realized in farming systems which have yet to generate vital ecological information on pest-natural enemy-complexes in relation to diverse cropping patterns and farm practices.

The ecology-based IPM perspective brings with it fresh insights and foresights to an encompassing, enriching, and healthy approach to pest management in the next seven years and beyond. An inherent consequence of this perspective would be the gradual change in looking at problems as a combined researcher-extensionist-farmer initiative and effort. With plant protection scientists becoming more and more aware of ecological imperatives on man-altered systems (e.g., agroecosystems) the systems-oriented, interdisciplinary approaches to R&D are now emerging and will bring about a synthesis of all R&D efforts of plant protection scientists with those of agronomists, plant breeders, soil scientists, microbiologists, meteorologists, engineers, social scientists, economists, NGAs, LGUs, NGOs and FOs toward the development of sustainable rice farming systems for the year 2000 and beyond.

The Crop Protection Division aims to contribute to PhilRice's corporate goal of self-sufficiency in rice through the development and promotion of IPM concepts which are ecosystem-focused, sustainable, cost-effective, economical, of practical application, environment-friendly, and compatible with each other. Farmers' fields will be the R&D focus of the CPD staff in the conceptualization of the IPM R&D Program, supported by basic as well as validation/verification studies at the PhilRice Central Experiment Station and its branches and stations. The farmer participatory research approach will be gradually incorporated into R&D initiatives and made fully operational by the year 2000.

Table 5.3 Schedule of Implementation, IPMP.

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
PROFILE OF RICE PEST PROBLEMS AND FARMERS' PRACTICES IN LUZON AND VISAYAS						
PROFILE OF RICE PEST PROBLEMS AND FARMERS' PRACTICES IN MINDANAO						
ARTHROPOD COMMUNITY STRUCTURE AND TROPHIC RELATIONSHIPS AND THEIR ANNUAL SUCCESSIONAL CHANGES IN RICE-BASED CROPPING SYSTEMS, COVERING CROP STEM BASES, GROUND LEVEL AND AQUATIC REGIMES						
TROPHIC RELATIONSHIPS OF INSECT PEST-COMPLEXES AND THEIR NATURAL ENEMY-COMPLEXES IN IRRIGATED LOWLAND RICE						
COLONIZATION AND SUCCESSION OF RICE INSECT PESTS AND THEIR NATURAL ENEMIES						
DIVERSITY OF NATURAL ENEMIES OF RICE STEMBORERS UNDER LOWLAND CONDITIONS						
SEASONAL FLUCTUATIONS OF POPULATIONS OF OTHER MAJOR RICE PESTS UNDER LOWLAND CONDITION						
CHEMICAL CONTROL OF STEMBORER POPULATIONS IN LATE-PLANTED RICE						
RESPONSES OF RICE STEMBORER POPULATIONS TO CULTURAL MANAGEMENT PRACTICES						
BIOLOGICAL CONTROL STUDIES FOR YELLOW RICE STEMBORERS USING EGG PARASITOIDS: STANDARDIZATION OF MASS REARING TECHNIQUES AND FIELD RELEASES						

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
MICROBIAL CONTROL OF MAJOR RICE INSECT PESTS						
DISPERSAL/MIGRATION PATTERNS OF LEPTOCORISA ORATORIUS (FABRICUS) AND THEIR NATURAL ENEMIES IN LUZON						
POPULATION DYNAMICS OF RICE BUG, LEPTOCORISA ORATORIUS (FABRICUS) AND THEIR MANAGEMENT IN REGION 8						
ECOLOGY AND MANAGEMENT OF THE BLACK BUG, SCOTINOPHORA COARCTATA IN HOT SPOT AREAS						
RESPONSES OF NATURAL ENEMIES OF RICE INSECT PESTS AND OTHER BENEFICIAL INSECTS TO PESTICIDES						
WEED MANAGEMENT IN DRY-SEEDED RICE						
BIOLOGICAL CONTROL OF SHEATH BLIGHT OF RICE (THANATEPHARUS CUCUMERIS) BY FLUORESCENT AND NON-FLUORESCENT PSEUDOMONADS AND BACILLUS SP.						
FARMERS' PERCEPTION, KNOWLEDGE AND PRATICES ON PEST AND DISEASES MANAGEMENT						
COMMUNAL FARMERS' MANAGEMENT OF RICE TUNGRO IN HOT SPOT AREAS OF THE PHILIPPINES						
REGULAR MONITORING AND FORECASTING OF TUNGRO INCIDENCE AND GREEN LEAFHOPPER POPULATION IN FARMERS' AND EXPERIMENTAL FIELDS						

e. Rice engineering and mechanization

Rice production is becoming expensive as a result of high labor requirement and increasing farm wage and the increasing costs of other inputs. In addition, high postharvest losses also result because of inefficient and traditional methods that have changed but very slowly for decades.

One alternative for Filipino farmers to make rice production more efficient is to use farm equipment and machinery. The use of farm equipment makes labor utilization more efficient and more productive while minimizing the drudgery involved in critical operations such as crop establishment and harvesting. Because labor is difficult to find during peak periods of operation, mechanization offers the conduct of field operations in a timely and efficient manner.

The use of postharvest and processing equipment also enhances the quality of farm produce; this results in minimum losses while also increasing the value of the product. As a result of ingenious machinery, it is also possible through mechanization to utilize farm wastes for more productive uses such as the utilization of rice hull for energy purposes or the use of processed rice straw in the farming system.

The Rice Engineering and Mechanization Program is tasked with providing the methods and equipment designs that will make rice production easier, more efficient, and more pleasant for Filipino rice farmers.

The Rice Engineering and Mechanization Program of PhilRice has taken the lead role in conducting research and development program concerning rice mechanization. The program still maintains close collaboration with the Bureau of Plant Industry (BPI), IRRI, UPLB, PCARRD, NAPHIRE, and other state colleges and universities.

Table 5.4 Schedule of Implementation, REMP.

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
DEVELOPMENT AND IMPROVEMENT OF FARM MACHINERY AND EQUIPMENT						
TECHNICAL VERIFICATION AND SOCIO-ECONOMIC ASSESSMENT OF RICE MACHINERY AND EQUIPMENT						
FIELD STUDIES/EXPERIMENTS ON IMPROVED RICE MACHINERIES AND EQUIPMENT						
PROMOTION OF RICE MECHANIZATION TECHNOLOGIES						
DEVELOPMENT OF LOCAL ENGINE						

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
ASSISTANCE TO FARM EQUIPMENT MANUFACTURERS IN THE PHILIPPINES						
CENTER FOR RICE ENGINEERING AND MECHANIZATION						
EVALUATION OF GASIFIER-ENGINE SYSTEM FOR SAHLLOW TUBEWELL IRRIGATION						
SYNTHESIS, EVALUATION AND PROMOTION OF EVAPORATION SUPPRESSANTS FOR RESERVOIRS (INCLUDING RICEFIELDS AND FISHPONDS)						

f. Rice chemistry and food science

The Rice Chemistry and Food Science Division (RCFS) has been part of the PhilRice research force for the past seven years. Its primary accomplishment has been grain quality evaluation of rice lines which is a continuing project in support of the Rice Varietal Improvement Program (RVIP). Grain quality evaluation is one of the major factors considered in recommending rice lines as rice varieties. This includes physical and physiochemical analyses, determining of cooking parameters, and sensory evaluation in place of a consumer panel. All these activities have contributed to the development of new rice varieties with good eating qualities and high consumer acceptability.

The continuing and increasing demand for high quality rices necessitates the development of new rice varieties. Thus, grain quality research has to continue. Simpler and faster methods, however, have to be developed to increase screening efficiency. Furthermore, more sensitive methods of detecting the differences in grain quality characteristics among rice cultivars are necessary since these differences have become narrow. Selection of rice lines for recommendation on the basis of physicochemical properties, for instance, is no longer as reliable and effective.

With the addition of personnel and with the Rice Chemistry area relatively established, more time and effort have been alloted to food science projects. Several rice based food products have been studied and developed. These products include preliminary studies on traditional rice food products and development and improvement of baked rice food products and beverages. Rice utilization, aside from table rice consumption, however, has not yet been fully explored. To maximize the benefits derived from rice, equal attention should be given to product development. Grain qualities of rice suitable for processing into rice food products should be established. Breeders likewise should be challenged to produce varieties not only for table rice but varieties specific for the different food products. Processing of these products will not only generate additional employment but also increase the competitiveness of rice in the local and export market.

Table 5.4 Schedule of Implementation, RCFSP.

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
GRAIN QUALITY AND SENSORY EVALUATION OF NEW BREEDING LINES/SELECTIONS						
MODERN RICE VARIETIES FOR TRADITIONAL FOOD PRODUCTS						
DEVELOPMENT OF NEW RICE FOOD PRODUCTS						
MOBILIZING THE ANALYTICAL AND SERVICE LABORATORY						
RATIONALIZATION OF SCREENING FOR RICE GRAIN QUALITY IN THE PHILRICE BREEDING PROGRAM						
ENHANCEMENT OF QUALITY FOR RICE FOOD PRODUCTS						
CHEMICAL AND SENSORY ANALYSIS OF RICE AROMA						
ASSESSMENT, TRANSFER AND ADOPTION STUDIES ON RICE WINE TECHNOLOGY						
OPTIMIZING RICE FLOUR PROPERTIES AND UTILIZATION IN FOOD PRODUCTS						

g. Social science and policy research

The program shall contribute to the development of the rice industry characterized by efficiency, competitiveness and sustainability, nurtured by a sound environment through proactive social science research and policy advocacy.

Table 5.6 Schedule of Implementation, SSPRP.

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
MONITORING OF RICE-BASED FARM HOUSEHOLDS IN STRATEGIC RICE AREAS						
STATISTICAL SERIES ON THE RICE ECONOMY						
SOCIOECONOMIC EVALUATION OF RICE-BASED FARMING IN THE PHILIPPINES						
SOCIOECONOMIC DIMENSIONS OF PHILRICE R&D PROGRAMS						
GOVERNMENT POLICY AND THE RICE ECONOMY						
ECONOMIC EVALUATION OF RICE-BASED AGRIBUSINESS INDUSTRIES						
ANALYSIS OF SEED PRODUCTION, DISTRIBUTION, UTILIZATION AND QUALITY CONTROL AND ITS ROLE ON RICE PRODUCTIVITY AND PROFITABILITY						
BASIC GRAINS AND LIVESTOCK MODEL FOR POLICY ANALYSIS						
SAFEGUARDING AND PRESERVATION OF THE BIODIVERSITY OF THE RICE GENEPOOL						
ECONOMIC IMPACT OF IPM PRACTICES IN THE RICE-VEGETABLE SYSTEM						

h. Technology Promotion (Communication)

This shall focus on a) communicating rice-based information and technologies to end users, b) developing appropriate media-based educational/learning strategies and materials, and c) designing feedback mechanisms to the rice research and development system.

Table 5.7 Schedule of Implementation, TPP (Communication)

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
PROMOTION OF RICE PRODUCTION TECHNOLOGIES THROUGH COMMUNICATION MEDIA						
COMMUNICATION STUDIES IN TECHNOLOGY PROMOTION						
RICE TECHNOLOGY AND KNOWLEDGE RESOURCE BASE						
MEDIA ADVOCACY AND PUBLIC RELATIONS						
NETWORK COMMUNICATION						
TECHNICAL PUBLICATIONS						
INSTITUTIONAL SUPPORT COMMUNICATION						
ACQUISITION OF LIBRARY MATERIALS						

i. Technology Promotion (On-farm Technology Demonstration)

On-farm technology development aspect of technology promotion shall cover a) integrating and demonstrating sound, acceptable, and viable technologies in partnership with farmers, b) giving feedback to the rice research and development system the strengths and constraints to the adoption of recommended rice-based technologies, and c) documenting and validating technologies developed and practiced by farmers.

Table 5.8 Schedule of Implementation, TPP (OFTD)

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
DEMONSTRATION OF HYBRID RICE TECHNOLOGY						
TTP DEMONSTRATION AND TRAINING FARM						
GPEP R&D PROJECTS						
DEVELOPMENT PROJECTS FOR SPECIAL ENVIRONMENTS						
ILOCOS-CAGAYAN HIGH YIELD RICE PRODUCTION AND RICE-BASED FARM BUSINESS PROJECT						

J. Technology Promotion (Training)

Training shall place emphasis on a) designing, evaluating, and developing appropriate training modules, methodologies, materials, and curricula, b) training a critical mass of subject matter specialists, researchers, extension workers and farmer- leaders, and) strengthening a network of trainers that can respond to local needs, and provide a feedback mechanism for end users and the rice research and development system.

Participants of training progams for the specialists and trainers will come from the Agricultural Training Institute (ATI), field offices and stations of the Department of Agriculture (DA), state universities and colleges, local government units (LGUs), SCUs, and non-government organizations (NGOs). The trained rice specialists will in turn train the trainers who will eventually conduct trainign programs for agricultural technicians and farmers.

PhilRice training alumni will be regularly updated about the latest technological breakthroughs in rice production. The trainers, rice specialists, and farmer leaders comprise a network of trainers who can be readily mobilized to respond to the needs of their respective regions, provinces and municipalities.

Table 5.9 Schedule of Implementation, TPP (Training)

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
RICE SEED PRODUCTION TECHNOLOGY FOR SEED GROWERS						
SEASON-LONG RICE SPECIALISTS TRAINING COURSE ON INTEGRATED PEST MANAGEMENT						
GPEP TRAINING						
RICE PRODUCTION AND TECHNOLOGY PROMOTION TRAINING COURSE (PhilRice-JICA TECHNICAL COOPERATION)						
DECS-PHILRICE COLLABORATIVE TRAINING COURSE FOR AGRICULTURAL-VOCATIONAL TEACHERS						
TEACHERS' TRAINING ON RICE CONSERVATION AND ENVIRONMENTAL WARENESS						
ONE MONTH TRAINING ON RICE PRODUCTION FOR LGU TECHNICIANS						
DOCUMENTATION OF RSTC-IPM TRAINING						

k. Seed Production and Health

The seed production and health shall focus on the production of breeder and foundation seeds, improve seed processing and distribution, and establish seed health procedures to ensure that the seed for distribution will be of high quality.

Seed production and health shall also conduct studies related to seed production, processing, storage, and health in collaboration with other programs.

Table 5.10 Schedule of Implementation, SPH

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
BREEDER SEED PRODUCTION						
FOUNDATION SEED PRODUCTION						
MAINTENANCE SEED PRODUCTION						
SPECIAL QUALITY RICE SEED PRODUCTION						
HYBRID RICE SEED PRODUCTION						
SEED PROCESSING, STORAGE, AND DISTRIBUTION						
SEED HEALTH TESTING						
NATIONAL RICE SEED PRODUCTION NETWORK						
COMPARATIVE YIELD PERFORMANCE OF HIGH-YIELDING RICE VARIETIES USING DIFFERENT CLASSES OF SEEDS						
EFFECT OF ORGANIC AND INORGANIC FERTILIZER ON SEED YIELD OF HIGH-YIELDING RICE VARIETIES						
RAT AND BIRD CONTROL						

I. Schedule of activities, the National Rice Research and Development Network

Table 5.11 Schedule of Implementation, NRR&DN

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
Development of the Operational Framework for the National Rice Research and Development System						
Decentralization of Research and Development Projects						
Strengthening Support to Cooperating Agencies on Human Resource Development						
Improve Information Exchange						

MONITORING AND EVALUATION SCHEDULE

PhilRice shall carry out the monitoring of projects on a quarterly schedule. The institute shall implement a system of progress reporting of accomplishments for more efficient project control. Monitoring shall cover both financial and physical aspects of the institute's projects.

Regular Project Monitoring

By the year 1997, PhilRice shall conduct a mid-term evaluation. The evaluation aims to self-examine the performance of the institute. The evaluation will result in the formulation of corrective measures that are essential to attain the corporate objectives of PhilRice.

Mid-term Evaluation

There shall be an impact evaluation by the year 2000. This evaluation shall examine the performance of PhilRice with respect to the adoption of technologies in the target KPAs. Planned and unplanned impact of the PhilRice projects to the improvement of the country's rice research and development system shall also be another focus of the evaluation.

Impact Evaluation

Table 5.12 Monitoring and evaluation schedule

Project/Activity	Implementation Schedule					
	1995	1996	1997	1998	1999	2000
Regular Monitoring	==	==	==	==	==	==
Mid-term Evaluation			==			
Impact Evaluation						==

Contents

INTRODUCTION

ORGANIZATIONAL REVIEW
- Positive Features of the Past PhilRice Organizational Arrangement
- Problem Areas that Need Attention

THE PROPOSED ORGANIZATIONAL SETUP
- The Proposed Organizational Setups

DELINEATION OF RESPONSIBILITIES
- The Board of Trustees
- The Director
- The Deputy Directors
- The Departments

THE NATIONAL RICE RESEARCH AND DEVELOPMENT NETWORK
- Operational Framework

INTERNATIONAL LINKAGE

Chapter 6 Organizational Structure

INTRODUCTION

Chapter 6 is about organization. This chapter intends to formulate the organizational framework that shall guide the organic structure responsible for achieving the PhilRice goal and objectives.

Chapter 6 begins with the review of the previous organizational setup of PhilRice, paying particular attention to its strengths and problem areas that need attention. Following this review is the formulation of the proposed organizational setup, structured in its appropriateness for the PhilRice Medium Term Development Plan. The chapter then places in proper perspective the functional responsibilities of the various organizational units of PhilRice and their relationships with one another.

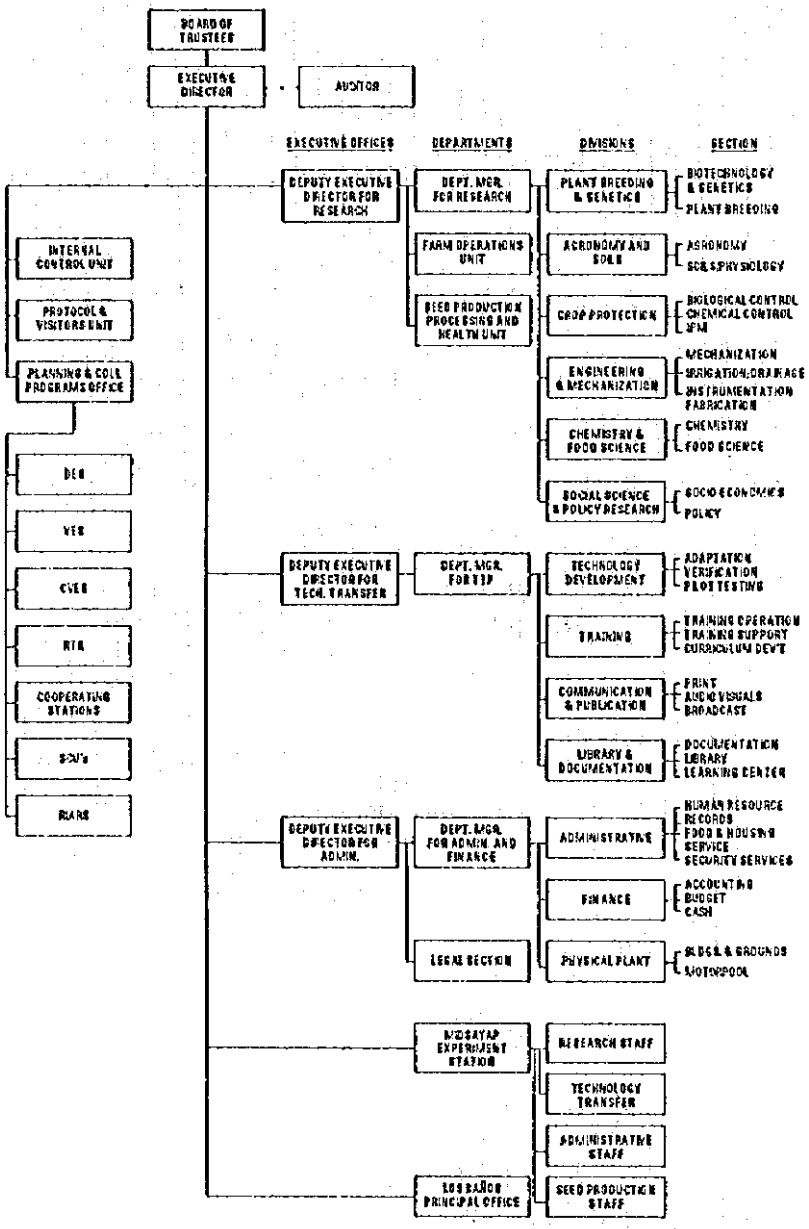
This chapter also defines the organizational relationship of PhilRice with the rice research and development network, both on the national and international levels.

ORGANIZATIONAL REVIEW

There are few bits of documented information that are useful in analyzing the previous organizational structure of PhilRice against its research and technology promotion performance. The only available information is the result of the PhilRice external review exercise, conducted from December 1992 to May 1993. However, the external review only came up with broad recommendations for organizational reforms.

Structural adjustments within the PhilRice organization are necessary in carrying out the institute's medium-term development plan. Perhaps it would be adequate to rely on self-generated observations in the absence of detailed external recommendations. Analyzing the organization in its strengths and problem areas that require attention is apparently a sound substitute for a relatively objective organizational review. Figure 5.1 shows the past PhilRice organizational chart that shall aid in the observation below:

Figure 6.1 PhilRice Organizational Chart, 1988-1994



Positive Features of the Past PhilRice Organizational Arrangement

Clear division of functional responsibilities

Research and technology transfer functions, together with their corresponding administrative and financial support services, are three separate areas of responsibilities. Each has its own contribution to attain the PhilRice goal and objectives. On the other hand, each also reinforces one another to attain the goal and objectives. PhilRice organization maintained smooth control over these complementary functions.

Strengthened organizational capability of research and technology promotion division

The past organizational setup was conducive to strengthening the organizational capability of the various research and technology transfer divisions of PhilRice. The divisions became independent units, but still maintained functional linkages with everyone. At the end of PhilRice institution building period, each division showed proofs of standing alone as exemplified by the various completed research and development activities.

Appropriate during the PhilRice institution building period

A functionally structured organizational setup apparently was the most appropriate during the PhilRice's institution building period.

Problem Areas That Need Attention

Research and technology transfer potential of branch stations not explored

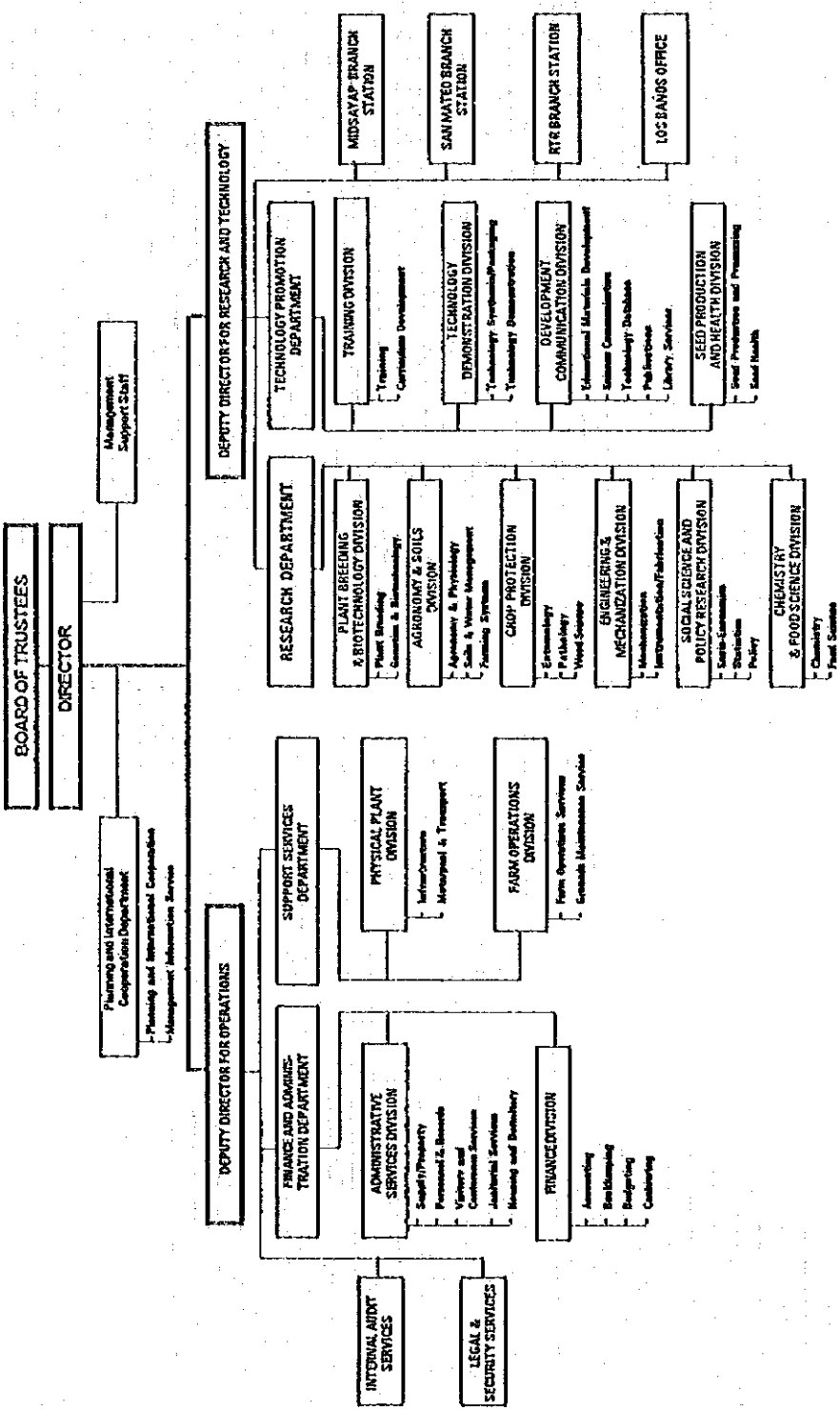
PhilRice placed its branch stations inside the organizational setup as units supporting research and technology transfer functions. In this regard, the institute did not explore the potentials of the stations as semi-autonomous units performing research and technology transfer functions in their service areas.

Absence of structure to carry out multidisciplinary research programs

PhilRice conceived its research programs to be multidisciplinary. The institute encountered problems in carrying out a multidisciplinary research program inside the division, and in forging research collaboration among the divisions. These problems were possibly due to an inappropriate structure to hold multidisciplinary research and technology transfer programs.

Initially, there were only programs and the program leaders also acted as administrators. Later, the divisions were created parallel to the programs to provide administrative and financial support to the programs. The objective was to free the program leaders, who were mostly seconded professors from UPLB, from administrative functions and thus, be able to concentrate on technical matters.

Figure 6.2 Proposed Organizational Structure (CORPLAN 1995-2000)



c. *Absence of a formal rice research and development network*

A formal organizational framework for the national rice research and development network has just been initiated. Now, participation in the National Cooperative Rice Testing Program (NCT) is the primary basis of being considered a part of the national network. There is still no organizational framework that is necessary in formalizing the national rice research and development network.

The idea of a network sharing resources and expertise is now in the process of fine tuning.

THE PROPOSED ORGANIZATIONAL SETUP

The Proposed Organizational Setups

Figure 6.2 shows the proposed organizational chart for PhilRice.

a. *Features*

Places branch stations in the frontline of program implementation

The branch stations are the most appropriate structures that shall be in the frontline in solving location-specific problems of rice research and development. The formulation of the organizational setup considered this scenario.

The proposed organizational setup would therefore lead to the creation of semi-autonomous PhilRice stations.

Creates structure for multidisciplinary program implementation

Sustaining the implementation of multidisciplinary programs and projects requires the creation of a structure that shall be responsible for managing and directing programs and projects. The Office of the Deputy Director for Research and Development shall be responsible for implementing interdisciplinary and interagency research and technology promotion projects.

Strengthens planning and corporate communications support to the Director

Placing the planning, monitoring, and management information system service under the Office of the Executive Director is one way of strengthening the planning and monitoring services at PhilRice.

Maintains a lean administrative and financial support

PhilRice shall continue to maintain a lean general organizational unit to carry out its administrative and financial support services. Administrative and financial support efficiency could be maintained by way of creating a functional organizational arrangement, considering the use of computing and communication technologies that are now readily available.

DELINEATION OF RESPONSIBILITIES

The Board of Trustees

The Board of Trustees is the highest policy making body of PhilRice. The Secretary of Agriculture chairs the Board. The PhilRice Executive Director acts as the board's Secretary. The board draws representatives from academic and science communities, government offices concerned in rice research and development, business sector, consumer groups, and farmer groups.

The Director

The Executive Director is the chief operating officer of PhilRice who shall be in-charge of the overall operations of the institute. As the executive director, he is accountable to the Secretary of Agriculture in achieving the goal of the institute in line with the agricultural development plan.

The Deputy Directors

For Research and Development

The Deputy Director for Research and Development shall be accountable to the Executive Director in preparing corporate plans and implementation of research and technology programs and projects in the central and branch experiment stations and network.

For Operations

The Deputy Director for Operations shall be accountable to the Executive Director in the provision of administrative and financial support services to research and development. Also under his supervision is the physical planning and maintenance of the infrastructure facilities of the institute. Likewise under his supervision is the legal and security services of the institute.

The Departments

Research and Development Department

a. Research Department

The Research Department shall be responsible for the generation of technology. Technology generation shall include the following:

1. The conduct of station-based research; and
2. The conduct of applied research in priority areas.

b. Technology Promotion Department

The Technology Promotion Department shall be responsible for the promotion of appropriate technologies. Technology promotion shall include the following:

1. Training of specialists, extensionists and farmer leaders;
2. Demonstration of technologies in coordination with concerned agencies such as LGUs and NGOs; and
3. Production of communication materials for technology promotion.

c. *Finance and Administrative Support Department*

This department shall be responsible for providing administrative and financial support services to the research and technology transfer departments. The areas of concern of this department shall be as follows:

1. Administrative services, which cover supply and property, personnel and records, visitors and conference services, janitorial services, and housing and grounds;
2. Provision of financial services, which cover accounting, bookkeeping, budget, and cashiering; and
4. Administrative and financial support to branch stations.

d. *Auxiliary Support Services Department*

This department shall provide logistic support to research, technology promotion, branch stations, and network. The areas of concern of this department area as follows:

1. Provision of physical plant services, which cover building and grounds and motorpool;
2. Provision of auxiliary services, which cover library, internal control, legal, and security and safety services; and
3. Provision of farm operations support services.

THE NATIONAL RICE RESEARCH AND DEVELOPMENT NETWORK

Operational Framework

The operationalization of the country's national rice research and development network is a legal mandate of PhilRice. PhilRice shall give substantial attention to formalizing the network. The existence of a formal organizational structure holding the member agencies together aims to smoothen the implementation of research programs that require collaboration of various agencies. The operation of the national rice research and development network shall be guided by the following:

Operational Definition

The National Rice Research and Development Network (NRRDN) is a formal and functional structure of strategically located agencies continuously sharing responsibility and resources, working toward a common goal of sustained self-sufficiency in rice.

Goal and Objectives

The goal of the network is to undertake dynamic collaborative efforts in implementing the national rice research and development program. In line with attaining this goal, the NRRDN shall have two specific purposes. These are: a) sustain efforts at strengthening capabilities and sharing of resources in the defined area of responsibility, and b) achieve effective and efficient conduct of rice R&D program.

The NRRDN shall have the following specific objectives:

PURPOSE	SPECIFIC OBJECTIVES
Sustain efforts at strengthening of capabilities and sharing of resources in the defined area of responsibility	Develop human and physical resources
	Define area of responsibility
Achieve an effective and efficient conduct of rice R&D program	Formulate research and extension agenda
	Develop strong research and extension linkage with LGU and NGO
	Establish and maintain an information network
	Improve planning and monitoring role
	Improve operational support services to research and development

c. *Composition of the network*

National headquarters

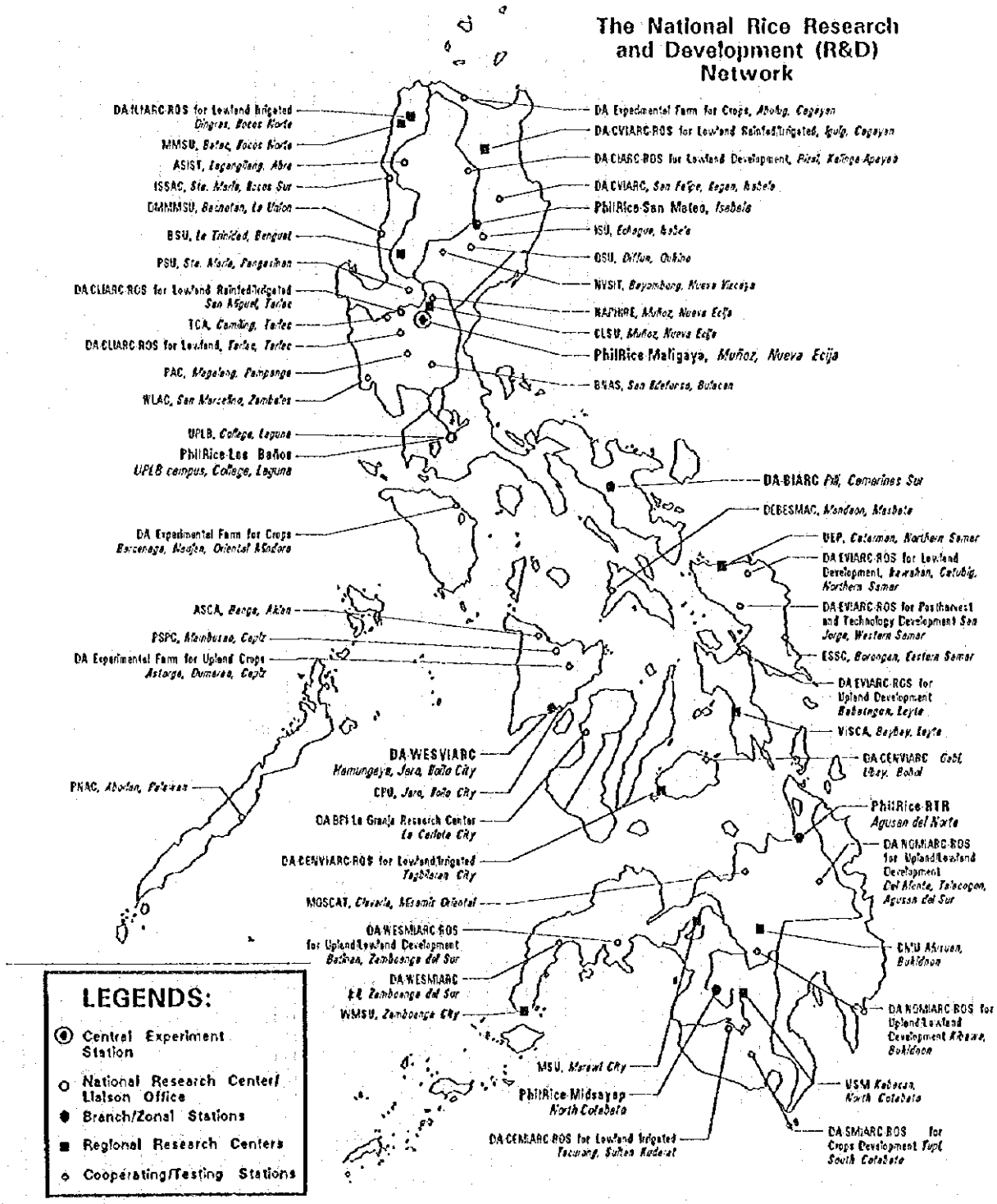
The national headquarters of the network shall be the PhilRice Central Experiment Station in Maligaya, Muñoz, Nueva Ecija, and the PhilRice Office on the UPLB campus.

Branch/Zonal Stations

These are stations attached to PhilRice that are as follows:

a. Philippine Rice Research Institute, San Mateo, Isabela
b. Bicol Regional Integrated Agricultural Research Center, Pili, Camarines Sur
c. Western Visayas Integrated Agricultural Research Center, Hamungaya, Jaro, Iloilo City
d. Philippine Rice Research Institute, Remedios Trinidad Romualdez, Agusan del Norte
e. Philippine Rice Research Institute, Midsayap, North Cotabato

Figure 6.3 Map of the National Rice Research and Development Network



Regional Research Centers

a. Benguet State University, La Trinidad, Benguet
b. Mariano Marcos State University, Batac, Ilocos Norte
c. Central Luzon State University, Munoz, Nueva Ecija
d. Central Mindanao University, Musuan, Buikidnon
e. University of Southern Mindanao, Kabacan, North Cotabato
f. VISCA

Cooperating/Testing Stations

The cooperating stations are smaller provincial state colleges and universities, and DA research stations.

d. Network Groupings

Aside from the functional composition of network, research and development networks shall be formed consistent with the program thrust of PhilRice. There are research and technology promotion programs that require the sharing of resources and expertise. There shall be network groupings for the following:

1. Varietal development
2. Technology promotion
3. Integrated pest management
4. Seed production and distribution
5. Rainfed lowland rice research
6. Upland rice research

Figure 6.3 shows the map of the National Rice Research and Development Network.

INTERNATIONAL LINKAGE

At present, PhilRice is maintaining close collaboration with the following international institutions:

6.1 International Rice Research Institute
6.2 Food and Agricultural Organization of the United Nations
6.3 Japan International Cooperation Agency (Japan)
6.4 Yunnan Agricultural University (China)
6.5 Virginia Polytechnic Institute and State University (USA)
6.6 Asian Vegetable Research and Development Center (Taiwan)
6.7 University of Agriculture and Forestry (Vietnam)
6.8 German Agency for Technical Cooperation (Germany)

Contents

INTRODUCTION

RESOURCES
Personnel Complement

BUDGET
Summary of Budgetary Projection

PROJECTS PROPOSED FOR EXTERNAL ASSISTANCE
The Projects

Chapter 7 Resources and Budget

INTRODUCTION

Chapter 7 is about allocation of resources and budget. This chapter has three parts. The first part deals with resources that include the personnel complement and the capital outlay. The second part presents the budget. Presentation of the budget shall conform with the budgetary preparation practice followed by the Department of Budget and Management. Finally, the third part identifies the projects proposed for external assistance.

RESOURCES

Personnel Complement

a. Staff Development Plan

PhilRice shall formulate a long-term staffing plan to match human resources requirement of the research and technology transfer programs and projects. Staffing plan shall place primary emphasis on recruitment for staff expansion and replacement, and upgrading of career positions.

i) Recruitment schedule

Recruitment shall consider the projected supply of manpower, staff turnover, retirement, and expansion of research projects. The recruitment plan shall be consistent with the following strategies:

1. Promotion of PhilRice to talented young graduates of primary universities in the Philippines;
2. Recruitment of staff with postgraduate degrees; and
3. Recruitment of research fellows and visiting scientists.

Table 7.1 shows the recruitment schedule.

Table 7.1 Recruitment schedule, 1994-2000 (number of recruits)

Activity	1995	1996	1997	1998	1999	2000
1. Recruitment (undergraduate)	5	5	5	5	5	5
2. Recruitment (postgraduate)	5	5	5	5	5	5
3. Recruitment of science research fellows	5	5	5	5	5	5

ii) Upgrading of Plantilla Positions

PhilRice shall implement a pay scale that would be adequate to attract high-caliber local scientists to work at the institute. A continuous upgrading of positions is a way of ensuring a pay scale that can encourage these scientists to work at PhilRice.

b) Scholarships and Training Plan

PhilRice shall formulate its scholarships and training plan following the research and technology transfer framework. The plan shall tailor degree and nondegree courses with the institute's strategic research and technology transfer concerns. PhilRice shall also strengthen its linkage with sponsoring institutions in order to draw the much-needed technical and financial assistance. Table 6.3 shows the schedule of scholarships and training.

Table 7.2 Scholarships and training schedule

Scholarship and Training	1995	1996	1997	1998	1999	2000
Postdoctoral	2	3	3	3	3	3
Doctoral	5	8	8	8	8	8
Masters	8	15	10	10	10	10
Nondegree training	10	20	20	20	20	20

BUDGET

Summary of Budgetary Projection

The table below presents the budgetary breakdown. The budgets are broken down by activities, by object of expenditures, and by program and project. Every budgetary breakdown has to serve a particular purpose. The breakdowns by activities and by object of expenditure conform with the DBM system of budgeting. On the other hand, the breakdown by program and project is essential for the institute's financial and physical monitoring purposes. This project system of budgeting aims to install a system of determining the cost involved in generating and promoting a particular technology.

Table 6.6 Budgetary breakdown ('000'000 pesos).

Budget Breakdown	1995[1]	1996[2]	1997	1998	1999	2000
1. By Activities						
a) Operation	114.9	91.1	130	142	172	197
b) Support to Operation	13.7	14.6	25	35	45	50
c) General Admin.	23.7	26.2	35	40	45	50
TOTAL	152.3	131.9	190	217	262	297
2. By Object of Expenditure						
a) Personal Services	49.3	56.8	64	70	78	85
b) MOOE (Maintenance and other operating expenses)	84.1	51.3	100	120	144	172
c) Capital Outlay						
- Equipment	12.7	10.0	12	15	20	20
- Infrastructure	6.1	13.8	12	12	20	20
TOTAL	152.3	131.9	190	217	262	297

Notes:

[1] *Based on 1995 actual budget*
[2] *Based on 1996 allocated budget by the DBM, which is subject to Congressional review*

Assumptions:

1. *The 1997 budget is used as the base year in the budgetary projection, making use of the following estimates:*
   a. *10% annual increase on personal services*
   b. *20% annual increase on MOE*
   c. *Projections on infrastructure and capital outlay are based on the present status of the existing facilities. The modest budget projected is in anticipation of updating of equipment and facilities to conform with modern standards for research and development.*

2. *Budget of the Mindanao Rice Research and Development Program, which is a project for special areas that will make a dramatic increase in production, shall be drawn from the proposed budget.. Beginning 1996, the project shall have the following budget: 1996= P40 M, 1997= P 50M, 1998= P50M, 1999=P70M, and 2000=P70 M.*

The projected budget, though modest shall augment the organizational capabilities of PhilRice to contribute in sustaining a globally competitive rice economy in the Philippines.

PROJECTS PROPOSED FOR EXTERNAL ASSISTANCE

PhilRice shall also propose projects for external assistance. These projects normally require higher level of expertise and entail costs beyond the regular budget. These projects therefore aim to augment the regular program of the institute.

The Projects

a. Rice Research and Development Program in Mindanao

A long-term development project which aims to strengthen the rice research and development support for Mindanao is being envisioned. The project aims to establish a semi-autonomous PhilRice program for Mindanao based at Midsayap.

b. Research and Development Project for High-Yielding and Mechanized Rice Production

The project seeks to develop high-yielding rice production technologies adapted to mechanized operations. The project content and activities are a) development of farm machinery, b) improvement of varieties, c) improvement of cultivation techniques, d) improvement of weed control techniques, e) improvement of pest and diseases management, f) development of farm management (socioeconomic aspect), g) improvement of farming systems, and h) development of rice-based food products.

c. National Center for Rice Engineering

A national center for rice mechanization shall be established at PhilRice. It shall be fully equipped with all the needed tools, facilities, and supplies to support engineers from the network who would come to PhilRice, and design, develop, and manufacture prototypes of machinery / equipment. The goal of the center is to promote rice mechanization, which shall also be the basis for the mechanization of other crops by just modifying the inventions.

d. Farmers Training Center

The project shall establish a rice training complex that will train farmers and trainors on the different aspects of rice production. The complex shall be fully equipped with the facilities that will augment the existing training resources of PhilRice.