Corporation: Philippine Rice Research Institute PHILRICE

I. CORPORATE PROFILE

A. Corporate Objectives (as mandated by its charter)

PhilRice is a chartered government corporate entity created through Executive Order No. 1061 on Nov. 5, 1985 (amended by EO 60 on Nov. 7, 1986). According to Section 2 of its charter, the purpose of PhilRice is to develop a national rice research program so as to sustain and further improve the gains already made in rice production, improve the income and economic condition 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. Its functions as outlined in Section 3 of the charter include, among others, the following:

1. Serve as the coordinating center of a national network of rice research stations located in the different agro-ecological regions of the country;
2. Plan and carry out research and development activities, specifically in the areas of varietal improvement, planting and fertilizer management, integrated pest management, farm mechanization and post-harvest engineering, farming systems, training and technology transfer, and social science and policy research;
3. Verify, package and transfer economically viable technologies, giving emphasis on the social engineering aspects necessary for group endeavor;
4. Provide the data base or policy formulation that will stimulate and sustain rice production, marketing and consumption;
5. Organize and develop strong training programs for rice scientists, research managers and extension workers; and
6. Publish and disseminate research findings and recommendations

B. Corporate Priorities for Year 2020

Guided by its new vision, "Rice-Secure Philippines" under its new Strategic Plan for 2017-2022, PhilRice and its partners will propose and execute strategies on how to create significant impacts on the lives of all rice stakeholders.

With its mission "To improve the competitiveness of the Filipino rice farmer and the Philippine rice industry and transform it to be more profitable, resilient, and sustainable through responsive, balanced, environmentally sound and partnership-based research, development, and extension." PhilRice will therefore pursue a balanced R4D programs and approach with the following outcomes:

1. Increased productivity, cost-effectiveness, and profitability of rice farming in a sustainable manner
2. Improved rice trade through efficient postproduction, better product quality, and reliable supply and distribution system
3. Enhanced value, availability, and utilization of rice, diversified rice-based farming products, and by-products for better quality, safety, health, nutrition, and income
4. Science-based and supportive rice policy environment
5. Advanced rice science and technology as continuing sources of growth
6. Enhanced partnerships and knowledge management for rice research for development (R4D)
7. Strengthened institutional capability

C. Major Programs and Projects (2017–2022)

To achieve its outcomes, on 16-17 January 2017, PhilRice conducted a workshop to map out programs and projects in pursuing the outputs and outcomes indicated in its new strategic plan for 2017 and beyond. As a result, six flagship R4D programs were identified, namely: (1) Climate-Resilient and Competitive Rice and Rice-Based Farming Systems; (2) Hybrid Rice; (3) Rice Seed Systems; (4) Rice Farm Modernization and Mechanization; and (5) Science-Based Policies in Advancing Rice Communities.

C.1. National Rice R4D Programs

Program 1: Climate Resiliency for Enhanced Agricultural Trade and Efficiency

This program addresses concerns on how rice farmers could cope up with the challenges they are or will be facing with regards to climate change and market competitiveness. In addressing these concerns, it shall focus on the development of new farming technologies that would help farmers manage climate-related threats (droughts, floods, strong typhoons, extreme ambient temperatures, rainfall variability, salt water intrusion) while enhancing and sustaining rice productivity, profitability, and efficiency in irrigated rice system. Moreover, it shall also cover the development of highly intensified, diversified and integrated rice-based farming system models as well as value-adding technologies so as diversify their sources of income and increase the chance of earning more thus contributing towards enhancing their resiliency. Moreover, to help reduce the incidence of poverty, hunger, and malnutrition in rural farming communities, especially during the incidence of calamities, among others, the program will also deal on the development of safe and nutritious products derived from rice and rice-based farms. Specifically it will:

1. Develop farming technologies that would help manage climate-related stresses in rice production such as droughts, floods, typhoons, extreme temperatures, salt water intrusion, and rainfall variability;
2. Develop highly intensified, diversified and integrated rice-based farming system models that could provide farmers additional income opportunities;
3. Develop processes/technologies that would enhance the quality and value of products derived from rice and rice-based farms;
4. Develop new innovations that would further enhance and sustain productivity, profitability and efficiency in irrigated rice system

Program 2: Hybrid Rice

The Hybrid Rice Program addresses by domestically producing sufficient rice at a competitive cost, resulting primarily from higher grain yield per unit area of cultivation. It aims to contribute in attaining rice sufficiency through development of wide adaptive, high yielding hybrid rice varieties with good agro-morphologica traits, acceptable grain and eating quality traits and resistance to major pests, as well as ensure sustained adequate supply of high quality nucleus and breeder seeds of parents and F1 hybrids in support to hybrid commercialization. Hybrid rice research is a worthwhile investment for the government owing to the following advantages when using hybrid varieties:

1. higher grain yield than inbred;
2. better use of resources;
3. More efficient use of inputs;
4. Provide labor opportunities in seed production and seed distribution.

Program 3: Rice Seed Systems

The Rice Seed System program intend to tackle problems in PhilRice seed production and supply chain and to provide new solutions towards attainment of seed security. In order to do this, the program will have to address three basic parameters of a seed security framework: seed availability, access, and utilization. Availability entails that sufficient amount of seeds are produced in time (temporal availability) and within reasonable proximity (spatial availability); while access denotes that people have the resources to acquire the seeds produced; and utilization means that the seed is of high quality and genetic purity from production until distribution (Remington et al. 2002).

The program is composed of three projects with several studies that in general aims to:

1. Evaluate the current production and postharvest protocol and operations in the generation seed multiplication systems of inbred and hybrid and establish appropriate protocols to improve seed quality assurance and production efficiency.
2. Increase accessibility of released varieties in areas without accredited seed growers.
3. To establish a responsive ICT-based rice seed information system for traceability of seeds produced by PhilRice and branch stations from line development to seed distribution.

Program 4. Rice Farm Modernization and Mechanization

The Program brings in an ensemble of advance technologies to take advantage of whatever benefits that they may bring towards realizing higher levels of productivity. Because of the complexity of the cropping systems and the newness of the technological concepts, isolated component approach in pursuing the technologies might be the preferred mode of implementation. However, we will strive for integrating their capabilities into a holistic system that is relevant to the target areas, and achieve more robust site-specific technological management. Doing so would make monitoring and adjustments to be greatly facilitated. Thus, the Program showcases state-of-the-art science based innovations, which are touted to create a greater impetus of technological advancement to the development of the Philippine rice world. In addition, the Program will complement in addressing increased productivity and profitability of farming; rice trade improvement for better post-production processes leading to enhanced value of the rice and rice-based products. Inputs to formation of policies by providing clear technology recommendations and science-based decisions will also be greatly facilitated by the Program.

Specifically, the program will:

1. Produce new technologies for farm mechanization in the production and post-production systems that leads to reduced labor costs, timeliness, less drudgery and mitigate grain losses;
2. Conceptualize and test new irrigation and drainage technologies as mechanisms to alleviate the negative impacts of climate change;
3. Enhance the production precision agriculture, smart marketing, and relevant information delivery through information technologies.
4. Develop biotechnological solutions to pathogen detection, pest and disease management and breeding of new rice varieties;

Program 5. Rice Business Innovation

The program aims to create and pilot test a development model for community transformation that is participatory, market-driven, and supported by a scientific production base to improve the competitiveness of rice-based farming communities. This will be done through establishment of rice hub that would serve as a farmers' support system in carrying out rice-based enterprises. Specifically, the program seeks to:

1. Examine the community's rice supply and market chain including the input suppliers, producers, processors, traders, and consumers as well as market opportunities; 1implement a communication strategy to increase awareness, interest, and willingness of target participants in engaging in rice-based enterprises;
2. Enhance the technical, organizational, and entrepreneurial capability of farmers and other stakeholders to engage in rice-based enterprises;
3. Develop and implement rice-based enterprise plans; and 6 develop a sustainability mechanism for the identified rice-based enterprises;
4. Organize and mobilize farmers and other stakeholders in support of the rice-based enterprise plan;
5. Establish a monitoring and evaluation system.

Program 6. Science-based Policies in Advancing Rice Communities

The program will focus on six key areas. They are on systems, policies, and standards; policy brief/paper; policy ordinances, campaigns; rice technology adoption and yield gap reduction in provincial agricultural development programs; databasing. All of these key areas are geared at making rice production technologies available and accessible to the main stakeholders with the end in view of making our rice industry regionally competitive.

Generally, key activities in this program include drafting of policy papers, launching of advocacy campaigns, and intensive policy reviews. A bi-annual review will be conducted to ensure achievement of targets and refinement of objectives, as necessary. Specifically it will:

1. Strengthen the rice policy environment
2. Sustain and enhance the welfare of farmers, stakeholders, and policy makers of the rice environment
3. Increase rice productivity and enhance profitability of rice based- farming

C.2. Discipline-Based and Upstream Rice R4D Projects

In support of the implementation of the Rice R&D programs, PhilRice is implementing basic and upstream research activities through its R&D divisions:

Plant Breeding and Biotechnology focuses on enhancing genetic variability of potential rice varieties/elite lines; developing breeding materials with yield-enhancing, stabilizing and value-adding traits for use as parents in hybridization programs and/or direct utilization as varieties; characterizing important germplasm and making available nucleus seeds for commercial cultivation. It seeks to ensure stable and sustainable rice production through the development of high-yielding, pest and abiotic stress-resistant and good grain quality rice varieties suitable to major rice growing ecosystems.

Agronomy, Soils, and Plant Physiology leads research efforts to evaluate, refine, and facilitate the delivery of improved soil, nutrient, and water management practices to enhance soil quality and profitability and plant resource use efficiency.

Crop Protection seeks to help attain rice self-sufficiency and build a competitive rice economy through the generation, development, and promotion of pest management strategies, which are environment-friendly, economical, sustainable, and compatible with each other to address farmers' needs. It also assists breeders in screening potential varieties for insect and disease resistance.

Genetic Resources carries out germplasm collection, conservation, management, dissemination and utilization. It ensures availability of fully characterized germplasm to rice plant breeders and researchers. It also conducts research on genetic diversity.

Rice Engineering and Mechanization develops machines and tools to increase the national level of farm mechanization and modernize rice production and postharvest operations to increase farm efficiency and productivity.

Rice Chemistry and Food Science focuses on increasing the productivity and profitability of rice farming systems by determining grain quality characteristics of rice; developing technologies on other uses of rice and its by-products; and promoting these high-quality and value-added products to benefit consumers/farmers and food manufacturers.

Seed Technology performs basic studies on seed biology and physiology, health and pathology, purity and quality control, production, preservation and storage, coating/treatment and mechanical seeding. It also ensures that high-quality seeds are available to farmers/stakeholders, and helps make rice farming a profitable business

by developing cost-effective and environment-friendly rice seed technologies. In addition, it runs and maintains a lab and facility for seed health and quality testing as prescribed in the international seed testing rules by ISTA.

Socioeconomics conducts research and policy studies to help develop an efficient, competitive; and sustainable rice industry, nurtured by sound policy environments. It supports PhilRice's function of providing timely information to the industry.

Technology Management and Services promotes/disseminates high-impact rice technologies through area-based technology promotion, and training and education to help increase the productivity and income of rice farmers'. Likewise, it enhances capacities of extension workers and other change agents through retooling or rice science and technology updates.

Development Communication promotes rice science for sustainable development through strategic use of communication media. It plays a major and significant part in communicating the results/products of rice science effectively, particularly to the intended users.

Information Systems and Data Management will interactively and collaboratively cater to the data information needs of rice stakeholders. The integration of information systems with the rice R&D will help to systematically plan, schedule, share, and document key activities that support the development of rice production technologies, farm equipment, technology transfer, and the production of high-quality rice varieties.

The PhilRice-based Crop Biotechnology Center implements a rationalized, effective, and efficient agricultural biotechnology R&D program for the Department of Agriculture with the end view of generating improved agricultural technologies, productivity, profitability and enhanced commercial potential, value, and activities for agricultural crops.

C.3. Area-Based Rice R4D Projects

Cutting across R&D programs are station-based projects that address location-specific problems in areas of operations of PhilRice Batac, Isabela, Los Baños, Bicol, Negros, Midsayap, and Agusan branch stations.

PhilRice Batac serves as the nucleus or core for development and improvement of intensified rice-based agri-bio systems (IRBAS) technologies and enterprises in semi-arid areas and other environments in Northwestern Luzon. It shall also develop

technologies and management options for rice and rice-based crops in the rainfed and drought-prone environments, such as water harvesting, conservation and management, and mechanized rice-based farm production and postproduction operations.

PhilRice Isabela focuses on development of IRBAS technology packages and enterprises for Northeastern Luzon that also features the high-yielding yet low-cost 10-5 (10 tons per hectare at Php 5.00 per kg palay unit production cost) technology system anchored on hybrid rice.

PhilRice Los Baños, in addition to being the Institute's principal office, serves as nucleus for developing and radiating IRBAS technology and enterprise systems in the Calabarzon region (Region IV-A). Its partnership with IRRI and host, UPLB will also focus on basic research studies in plant breeding, crop protection, agronomy and soils, rice chemistry and food science for the generation of new products out of invention, innovation or discovery. The station also shall oversee the development of ***PhilRice Mindoro*** satellite station as the IRBAS nucleus estate model for the entire Mindoro Island.

PhilRice Bicol develops and promotes IRBAS technology packages and enterprise systems for the Bicol Region with special focus on climate change adaptation and resilience. It will also shepherd the ***PhilRice Samar*** satellite station which will be developed as the IRBAS-focused nucleus to spur rural transformation and development and attain inclusive growth in the entire Samar Island.

PhilRice Negros pilot-tests, fine-tunes and radiates fossil fuel-free IRBAS technology packages and enterprises for Western Visayas, even as it is being transformed into an organic rice-based integrated and diversified product development center.

PhilRice Agusan is the Institute's IRBAS nucleus estate for Northern Mindanao. Similar to PhilRice Bicol, it will also refine and promote IRBAS technologies and enterprises to CARAGA communities vulnerable to adverse effects of climate change. Moreover, it will also address challenges, such as nutrient-deficient and problem soils and low solar radiation in the area because of frequent rainfall.

PhilRice Midsayap is being transformed to be the IRBAS nucleus estate model for Southern Mindanao, with focus on ecological engineering and integrated pest management practices because of the prevalence of pests of rice and other crops within the region. It also oversees the ***PhilRice CMU*** field station and office located inside the Central Mindano University campus in Maramag, Bukidnon, where 100 hectares have been made available by CMU to PhilRice for rice seed production and IRBAS technology and enterprise development and promotion in Central Mindanao.

In addition, PhilRice Midsayap also initially supervises the development of the ***PhilRice Zamboanga*** satellite station into the IRBAS nucleus estate model for the Zamboanga Peninsula.

C.4. Specialized Rice R&D Programs/Projects

C.4.1. Strengthening the rice biotechnology center at PhilRice

In harmonization with the DA Administrative Order No. 6 series of 2015, mandating for the strengthening of agricultural biotechnology center at PhilRice, and to adapt/meet the ever-increasing demand for new crop biotechnology products, the project will reinforce the potential of the crop biotechnology center lead by PhilRice. With improved structure, facilities, equipment, personnel, and collaboration, the center can now work on R&D using genomics and genetics, bioinformatics and computational breeding; molecular breeding, genetic engineering and germplasm enhancement, tissue-culturing, diagnostics and ecosystem biology, natural products and value-adding towards the creation of new/improved crop.

In general, the project aims to enhance/strengthen the crop biotechnology center at PhilRice. Specifically, it aims to:

1. Established a state-of-the-art Rice Biotechnology Center and Facility by 2018;

2. Enhance/develop a core of suitably trained and specialized personnel on various levels for research and development in biotechnology and related fields
3. Rationalize agricultural rice biotechnology R&D using the newly established Rice Biotechnology Center and Facility
4. Host biotechnology research on other priority crops and coordinate trainings of young scientist from the DA in cutting edge biotechnology tools and applications

C.4.2. Support to Rice Competitiveness Enhancement Program - Seed and Extension Component

The national implementation of the RCEP-SC is a new mandate given to PhilRice per RA11203, with an annual budget of P3.1B from 2019-2024. Rule 13.17.1 of the implementing rules and regulations (IRR) of the law further supports the creation of a Program Management Office (PMO), as necessary for this purpose. However, the existing structure, human, and financial resources of PhilRice are designed for rice research and development functions while the RCEF requires nationwide program monitoring, field operations, and administrative and finance support services. Hence,

the current organizational design of PhilRice must be restructured to absorb this additional function, supported with funding for program management.

Rule 13.11 further states that PhilRice, as an implementing agency, shall submit an organizational modification plan to perform its expanded function. It is also provided in this rule that the budgetary requirements for program management in the ensuing years shall be provided in the succeeding annual budgets of PhilRice. NEDA, DBM, and DA also recommended that the budget for program management shall not be charged to the P3.1B, but to the regular fund of PhilRice under the general appropriations. Hence, PhilRice submits this budget proposal for program management and organization modification to implement the RCEP-SC under Tier 1 of the 2020 general appropriations. The proposal includes salaries of personnel to be hired; maintenance and other operating expenses for travel, supplies, monitoring/meeting; and equipment needed by the PMO.

In general, the RCEP-Seed Component aims to improve the yield in rice-producing provinces through adoption of certified inbred seeds. Specifically, to:

1. Improve quality, availability of, and access to certified inbred seeds;
2. Increase utilization of certified inbred seeds in provinces with low adoption rate; and
3. Increase number of organized farmers engaged in seed production and trade

D. Linkages of Corporate Priorities/Programs/Projects with the National/Sectoral Plan, the Medium-Term Philippine Development Plan, and National Pronouncements

As the lead agency for rice R4D, PhilRice and its partners envision a *"Rice-Secure Philippines"*. Rice security, in our parlance, means availability, affordability, and accessibility to high-quality and nutritious rice at all times. This vision therefore encompasses broad areas relating to rice cultivation, commerce, consumption, and competitiveness. It is founded on the President's and DA's vision of a food-secure society where farmers enjoy decent and rising standards of living with available and affordable food for all Filipinos.

For 2017-2022, PhilRice has laid down concrete targets that it commits itself to achieving guided by its vision and mission of improving the competitiveness of the Filipino rice farmer and the Philippine rice industry and transforming it to be more profitable, resilient, and sustainable through responsive, balanced, environmentally sound and partnership-based research, development and extension. This Plan orchestrates all known voices in rice R4D such as those from plant breeders,

agronomists, rice machine experts, crop protection specialists, social scientists, and resource-poor farmers.

It is anchored on global targets set forth in the *UN's Transforming Our World: The 2030 Sustainable Development Agenda* (Assembly, 2015). This agenda takes off from the Millennium Development Goals. Specifically, it responds to Goal 1 (Eradicate poverty in all its forms everywhere) and Goal 2 (End hunger, achieve food security and improved nutrition, and promote sustainable agriculture).

Moreover, it also adheres to the vision of the ***Philippine Development Plan 2017-2022, Chapter 8 – Expanding economic opportunities in Agriculture, Forestry and Fisheries*** as it focuses on expanding economic opportunities in Agriculture, Forestry and Fishery (AFF); and increasing access to economic opportunities by small farmers and fisherfolks**.**

For the **Gender and Development Initiatives** the committee ensures gender is mainstreamed in the Institute's research and development projects. Specifically, development projects are required to have a gender component so that the Institute's technologies and rice information are accessed and available to both men and women rice stakeholders. Proposed research projects that mainstream gender in its activities will have a higher chance of being implemented. The committee also leads in the capacity enhancement of PhilRice staff on gender and development. All these improve the Institute's reach to women and other disadvantaged stakeholders in the rice community thereby, optimizing research and development contributions. The mainstreaming of gender in the Institute's R&D is in response to Republic Act 7192 (otherwise known as the Women in Development and Nation Building Act) which affirms the State's recognition of women's role in nation building.