Quality Rice. Quality Life.

TOWARD A RICE-SECURE PHILIPPINES:

IDENTIFYING KEY PRIORITY GOVERNMENT INTERVENTIONS IN 2017-2022

Proceedings of a Policy Seminar

Sulo Riviera Hotel, Matalino St, Diliman, Quezon City
September 30, 2016

Philippine Rice Research Institute
Central Experiment Station
Maligaya, Science City of Muñoz, 3119 Nueva Ecija

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FOREWORD

In 2010-2015, the Department of Agriculture (DA) focused its efforts on attaining 100% rice self-sufficiency toward reducing the country's dependence on the unstable supply in the international grains market. The government then launched the Food Staples Sufficiency Program (FSSP) that aimed to achieve sufficiency by 2013. To attain this goal, FSSP concentrated on three major strategies: (1) raising farm productivity and competitiveness; (2) enhancing economic incentives and enabling mechanisms; and (3) managing food staple consumption. Consequently, the country grew its rice production (3.17%), area harvested (1.37%), and yield (1.80%).

In 2016, a new DA Secretary assumed leadership. It is critical for a new agriculture chief to implement programs and projects that could at least sustain the growth of the rice industry. Moreover, prudent allocation of limited resources is important to ensure their best use and consequently result in significant and stable growth in the industry.

Along this vein, the Philippine Rice Research Institute (PhilRice) conducted the seminar-workshop titled *Toward a Rice-Secure Philippines: Identifying Key Priority Government Interventions for 2017-2022* on September 30, 2016. The goal of this initiative was to consolidate ideas and recommendations from rice stakeholders on concerns that they perceived to be of utmost and immediate importance. Policymakers, researchers, extension agents, and representatives from the private sector and the academic community converged in the event and consensually identified key interventions that DA could prioritize to pursue growth in the rice industry.

The proceedings document the presentations, discussions, and pieces of advice that transpired during the seminar-workshop. We hope that this publication will be a useful reference for those who want to know about and learn from the consolidated opinions of the stakeholders on the much-needed interventions for the industry.

SAILILA E. ABDULA, Ph.D.
Acting Executive Director

ACKNOWLEDGEMENT

We are grateful for the effort of the Policy Research and Advocacy (PRA) Team in successfully organizing the policy seminar *Toward a Rice-Secure Philippines: Identifying Key Priority Government Interventions in 2017-2022* that became the basis of this publication. Appreciation is also given to the Socioeconomics Division (SED) of PhilRice in supporting this event from planning until its conduct. We are also grateful to the former acting deputy executive director for development, Dr. Flordeliza H. Bordey for supporting this event.

We would also like to express our deepest gratitude to the seminar speakers and discussants who provided their research and discussion papers for this publication. Finally, appreciation is given to the PRA Team, selected SED staff, and the Development Communication Division that comprised the editorial team of this proceedings.

WELCOME REMARKS

Eduardo Jimmy P. Quilang

A pleasant day to all of us! We, at DA-PhilRice, are delighted to be with you today to engage in a very crucial activity. I would like to welcome everyone who has given us his or her valuable time to participate in this policy seminar-workshop. To our resource persons who will share their knowledge and insights: Dr. Flordeliza Bordey, of DA-PhilRice; Dr. Roehlano Briones of PIDS; Dr. Isabelita Pabuayon of UPLB; Dr. Eliseo Ponce of VSU; Engr. Renato Dela Cruz of ATI; Mr. Nomer Esero of BRIA; DA USec Ariel Cayanan; Mr. Raymond Patrick Cabrera of DA-BAR – welcome and thank you very much in advance.

Of course to all our Socioeconomics Division staff headed by Ms. Rhemilyn Relado, for their efforts in organizing this activity as part of the policy research and advocacy project; and to our very active and compassionate PhilRice Director Sailila Abdula for always extending his support and for being with us today.

Also, I'd like to welcome the members of the PhilRice Board of Trustees including the members of our EPMR panel, all officials and staff of DA and its attached agencies, National Economic and Development Authority (NEDA), Philippine Council for Agriculture, Aquaculture, and Natural Resources Research and Development (PCAARRD), Office of the Presidential Assistant for Food Security and Agricultural Modernization, House of Representatives and Senate of the Philippines (Committee on Agriculture and Food), Senate Economic Planning Office, Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA), International Rice Research Institute (IRRI), our partner universities, and to all participants. Good morning!

In 2013, the DA-PhilRice in partnership with IRRI has embarked on a challenging research project titled *Benchmarking the Philippine Rice Economy Relative to Major Rice-Producing Countries in Asia.* This research study examined the competitiveness of Philippine rice relative to its neighboring countries. We are blessed and proud to announce that the study was a success and that the results of their efforts have been very useful to our policymakers. We are thankful for the support given by DA and the assistance of the Food and Agriculture Organization (FAO).

The results of the study have provided us with valuable information/ benchmark data that can essentially contribute in achieving our shared vision of a food-secure society where farmers enjoy decent and rising standards of living. Starting this year,

through the leadership of our DA Secretary Manny Piñol, new projects and programs in agriculture shall focus on (1) fast and effective agricultural technology transfer to farmers; (2) easy access to financing; and (3) efficient marketing for farmers' produce.

Today, we are gathered here to focus on our very own staple food—rice. Starting 2017 and beyond, DA-PhilRice together with its partners envisions a rice-secure Philippines. By this we mean, availability, affordability, and accessibility to safe and nutritious rice at all times—anchored on the agenda of DA and ultimately, to the priority of our President. In order for this vision to become reality, we recognize that public policy is vital.

If I may borrow a statement, "Public policy determines the quality of the air we breathe and the water we drink. It affects the food we eat—how it is harvested, where it is distributed and sold, and how much we pay." Therefore, public policy strongly affects us. It influences every aspect of our lives.

As an official leading a research institute, I can say that research evidence is central to the development and evaluation of policy. Therefore, evidence-based policymaking is important and needed. It helps us make well-informed decisions using the best available research and information at all stages of the policy process. I believe that policy, which is based on systematic evidence produce better outcomes because:

1. It involves a shift away from opinion-based decision-making towards decisions-based on high-quality, valid, and reliable evidence. Conventional wisdom is often wrong;
2. It strengthens the accountability of decision-makers and improves the accuracy of policy development; and
3. It helps reduce wasteful spending or avoid costly mistakes.

Taking these into account, may we be reminded of the quality, credibility, relevance, and the cost of the policy as we assist in identifying key interventions that will fit in the three-point agenda of DA.

Again, I would like to thank everyone in advance for your active participation and hopes that at the end of the day our spirit of service, compassion, and courage has been renewed and that the horizon towards what we want to achieve is made even clearer.

I am thankful that we are given this chance to assemble here so we can help provide available and affordable food to our fellowmen and our families, as we continually adapt to the challenges of today and the future.

Again, a pleasant and a productive day to all of us!

RICE RESEARCH AND DEVELOPMENT AGENDA AND PROGRAMS FOR 2016-2022

Raymond Patrick L. Cabrera

The Bureau of Agricultural Research (BAR) is a staff bureau of DA in coordinating and funding various research for development (R4D) programs and projects of the department through its partner R4D implementing institutions. Anchored on the thrusts and programs of the department and on the bureau's R4D framework, it has the following R4D programs/modalities and support interventions on its priority commodities and thematic areas; Basic and Applied Research, Community-based Participatory Action Research (CPAR), National Technology Commercialization (NTCP), Human Resource Development Program, R4D Facilities Development Program, Knowledge Products and Services, Information, Communication & Technology, and Policy Research and Advocacy.

One of the bureau's major commodity R4D programs is the rice R4D being implemented through partnerships and collaborations with international, national, and local R4D institutions such as the Philippine Rice Research Institute (PhilRice), International Rice Research Institute (IRRI), DA-Regional Field Offices (DA-RFOs) and DA staff bureaus and attached agencies, state universities and colleges (SUCs), local government units (LGUs), and non-government organizations (NGOs)/ private sector (PS)/ civil society organization (CSOs)/ people's organizations (Pos). Using the grant funds from the bureau and DA through the National Rice Program, implementation of these R4D activities have been facilitated to which have generated, developed, and disseminated numerous rice-related data/information, tools and technologies on seeds/ varieties, farm inputs, production practices/technologies, decision support and ICT tools, postharvest technologies etc.

In 2013, implementation of major R4D initiatives under the renewed DA-IRRI R&D partnership in support to the Food Staples Sufficiency Program (FSSP) was facilitated. The partnership, which was officially initiated on 8 December 2012 through a memorandum of agreement (MOA) between DA and IRRI was signed and agreed upon by both parties for the renewal of their partnerships and collaboration for research, development, and extension (RDE) programs/projects on sustaining rice self-sufficiency and food security in the Philippines. These collaborations aim to contribute in addressing the challenges of the FSSP of the department such as the adoption of yield-enhancing technologies of farmers to increase productivity and enhance their economic incentives; improvement in the delivery of research, development, and extension services; and strengthening the capacities of public institutions by exploring innovative approaches to deliver various farm services.

Starting from 2013, the following projects supported for implementation under the partnerships were:

1) Benchmarking the Philippine Rice Economy Relative to Major Rice-Producing Countries in Asia− It was able to generate and analyze detailed information on yield, input uses, production and marketing costs, crop management practices, labor-using and labor-saving practices, various support services provided by the government, gross marketing margin, and competitiveness of the Philippine rice as compared to selected Asian countries. Information on policies that can affect competitiveness of the rice industry of the covered countries, and cost and returns analysis for hybrid seed production are also included in this project.

2) Philippine Rice Information System Management (PRISM) − This has delivered accurate, timely, and detailed data on rice area, seasonality, and yield in the form of maps, graphs, and tabulated data; as well as damages (including assessment reports) owing to flood or drought; and reports on rice pest injuries and diseases by integrating remote sensing, crop modeling, and information and communications technology (ICT).

3) Rice Crop Manager− A decision support tool, which has been field-tested and evaluated in diverse fields and contributed to the implementation of appropriate 'modern precision farming' by providing farmers with personalized crop and nutrient management recommendations matching their location-specific rice-growing conditions to which generated income on its 1st phase of implementation.

4) Accelerating the Development and Adoption of Next-Generation (Next-Gen) Rice Varieties for the Major Ecosystems in the Philippines− It fast-tracked the breeding, introduction, and adoption of higher-yielding rice varieties and hybrids with resistance to biotic and abiotic stresses with the use of new methods of speeding up adoption of these varieties through multi-environment testing and faster production of high-quality seeds within an ecosystem.

5) Accelerating the Development and Dissemination of Associated Rice Production Technologies that are Resource-Use Efficient− Through technology demonstration farms, it studied, promoted, and disseminated the alternative wetting and drying (AWD) technique and other appropriate associated technologies on water management, water-saving technologies, reduced tillage, crop establishment, mechanized direct seeding, use of drum seeder and MP Seeder, nutrient management such as the Leaf Color Chart, Minus-One Element Technique, and Rice Crop Manager; and other technologies in the *PalayCheck* system such as weed and pest management, mechanized harvest and postharvest options and mechanization.

6) Improving Technology Promotion and Delivery through Capability Enhancement of the Next Generation of Rice Extension Professionals and Farmer Intermediaries− It has developed and improved the capability building framework for the next generation of rice extension professionals & other intermediaries. It pilot-tested the developed training curriculum and trained

new breed of organized extension professionals called AgriDOCs (agricultural development officers of the community) from Luzon, Visayas, and Mindanao; designed and modified knowledge sharing and learning (KSL) activities for other strategic extension intermediaries; continuously improved the available ICT tools such as text centers, *PinoyRice Knowledge Bank*, and e-Ext; and crafted a policy paper with recommendations to invigorate the extension system.

7) Raising Productivity and Enriching the Legacy of Heirloom/ Traditional Rice Through Empowering Communities in Unfavorable Rice-based Ecosystems− This project characterized 80 collected heirloom varieties actively grown by farmers in CAR and Cotabato Province through the established varietal performance trials for basic agro-morphological characterization, purification, and participatory varietal selection. It also geotagged and mapped areas planted to various heirloom rice varieties and their biophysical data; organized, assessed, and capacitated the participating farmers and self-help groups for the modified season-long training on highland rice production and entrepreneurship; developed the Farmers' Field School Curriculum Guide and Modified *PalayCheck* System for Highland Rice Production Areas; conducted value addition of varietal products in terms of information on shelf-life, suitable packaging material, and attractive and informative product label and market-linkaging activities to both domestic and international markets.

In addition to these major partnership projects, the other major components of the rice RDE program being funded and coordinated by the bureau is the Strategic Research and Development FSSP Support Projects. Specifically, some of these projects supported are on the:

1) Profiling and seed multiplication/ purification of selected traditional rice varieties− it determines the genetic identity, grain quality profile, and nutritional value of selected traditional rice varieties to ensure consistency of their excellent export quality, and enhance their marketability and salability in the competitive world market.

2) Identifying and selecting transgressive segregants from Philippine-released hybrid rice varieties− it determines high-yielding segregants with phenotype equal to or better relative to the original F1 hybrids with better tolerance to *tungro* and bacterial leaf blight (BLB).

3) Value chain analysis of the Philippine rice industry− it aims to identify priority interventions along the rice value chain and provide specific policy directions and strategies to improve the rice industry in general, and specific segments in the rice value chain particularly small rice farmers.

4) Rice yield gap and economic efficiency in the Philippines− it generates relevant data and information that can be used in identifying interventions to improve efficiency and reduce yield gap in various provinces in the Philippines.

5) Palayamanan Plus in lowland farms− it focuses on farmers' development, demonstration, and adoption.

6) Upland Rice Development Program−it harnesses the potential of the upland rice ecosystems by establishing community-based seeds system for traditional upland rice varieties and promoting a "farming systems approach" anchored on sustainable agricultural practices.

7) Reduced tillage technology and *PalayCheck* system− it shows that it can reduce land preparation costs by 15-20% and save at least 20% of the total water requirement without an associated reduction in yield with corresponding increases in labor productivity and energy efficiency.

8) Ecological engineering/ bund agriculture in rice production− it is an approach to restore and conserve ecosystem services for pest management.

9) Aerobic rice technology− it contributes in developing a more sustainable rice-based farming system in water-scarce areas coupled with other appropriate and effective rice production management practices.

10) Community-based participatory action researches on integrated rice-based farming systems in different municipalities/barangays (irrigated and rainfed ecosystems).

Additional projects include:

11) Food demand survey− it aims to generate updated data on per capita consumption of rice and other agricultural food commodities, which specifically determines the average per capita consumption, the emerging consumption patterns of Filipino households, substitution of rice with other commodities, and the quantity of rice and corn leftovers, wastage, and animal or pet consumption.

12) Small-Scale Irrigation Systems-related studies such as Database System on SSIP, GIS-Based Water Resources Assessment for SSIP suitable site identification, and Performance/Impact Evaluation.

In February 2016, the bureau organized the National Multi-Stakeholder's Consultation Workshop for the Review and Updating of Research Development and Extension Agenda and Programs (RDEAP) for the various agricultural and fishery commodities of DA for 2016-2022. The packaged document from this consultative workshop will serve as valuable guide and reference of the bureau in prioritizing and allocating resources for agricultural R4D activities for 2016-2022. These RDEAP are envisioned to be inclusive: industry-responsive but considers the needs and concerns of small-scale producers and consumers; considers sustainable environment amidst climate change; pragmatic: conscious of what has been achieved or not; must be anchored on verifiable indicators; and aligned with key national programs and thrusts. It should also assess and initiate enabling environment for growth and development; and link R4D with extension strategies and policy recommendations.

The RDEAP 2016-2022 focuses on the following: 1) food staples, feed resources, and other alternatives; 2) commercial crops; 3) poultry and livestock; and 4) fisheries and aquaculture. The main concern of farmers and fishermen is not only productivity and household food consumption but more importantly, better market access and opportunities. Hence, the updated RDEAP 2016-2022 has adopted the value chain

structures and identified problems, researchable areas, and expected designs to help improve the competitiveness of Philippine crops, livestock and poultry, and fisheries by providing solutions to specific problems on competitiveness for each stage in the value chain.

For the next medium term, the Rice R4D agenda and programs are anchored on contributing to the Philippine rice industry that creates an environment that would foster competitiveness and sustainable growth by a) developing resiliency of local rice production to climate adversity and trade liberalization; b) providing decent income for the farming household; and c) sustaining industry growth for food security.

The alignment of rice RDEAP to value chain in identifying priority researchable areas, ASEAN Economic Integration, and lifting of rice quantitative restriction (QR) in 2017 is targeted to contribute in addressing the challenges and problems such as biotic and abiotic stresses (pest and diseases, changing weather patterns and climatic conditions), soil degradation, land use conversion (irrigated rice lands to industrial, commercial, residential use), prolonged implementation of land reform, water scarcity, and declining stream flow increasing siltation rate owing to watershed degradation, insufficient seed supply, seed availability, and uneven seed distribution. This also targets to address issues on high post-harvest losses and high drying costs, inconsistent product standards relative to competitiveness of rice quality (physical), limited option for value-adding, utilization of rice by-products in farm-based enterprises, low income on rice farming and rice farming households, high cost of credit/financing and low accessibility to crop insurance, and low adoption and utilization of technologies.

For the input components covering seed, soil, water, fertilizer, and pesticide, the following were identified as research themes/areas:

- Varietal development for hybrid and inbred rice that are high-yielding, short-maturing, with good eating quality, resilient to climate change, and has potential tolerance to biotic and abiotic stresses (8t/ha for inbred and 10t/ha for hybrid and beyond yield potential under irrigated condition, 5t/ha for rainfed; 90-days maturity);
- Adaptability trials of varieties to different agro-ecological systems (e.g. high-yielding rainfed varieties);
- Development of a mechanization protocol for seed production and post-harvest *(both for lowland and upland);*
- Real-time information system on seed availability;
- Innovative strategies in seed production and distribution for the upland environment;
- Soil health determination and improvement of soil conservation and rejuvenation practices (cut across commodities);
- Studies on the improvement of irrigation design systems to withstand and cope with impacts of adverse weather condition;
- Identification and development of water-harvesting technologies to improve water use efficiency;
- Adoption and impact evaluation of controlled irrigation and AWD strategy;
- Inventory and assessment of water resources including watershed assessment;

- Performance and impact evaluation of Small-Scale Irrigation Systems (SSIS/ SSIPs) for all ecosystems;
- Assessment of water quality in SSIS for rice irrigation and other agricultural uses; and
- Assessment of utilization and development of high-quality biocontrol agents, biopesticides, and biofertilizers

For the production component, researchable areas are on:

- Improvement of decision support and diagnostic tools, guides, markers (e.g. RCM, PRISM, SRAI) for precision farming;
- Improvement of weather and climate forecasting as part of DA's crop forecasting (modeling and weather data generation);
- Dynamic location-specific planting calendar based on seasonal climate outlook;
- Development of localized surveillance, early warning and forecasting systems for pest outbreaks and epidemics;
- Development of crop management options, yield-enhancing and cost-reducing management practices (POTs that will produce at competitive level);
- Intensification, diversification, and integration of rice-based farming systems and enterprises including agro-ecotourism;
- Optimization of crop management system for water-scarce areas (rainfed lowlands and rainfed uplands);
- Determination of the effects of climate change to rice cropping and hydrological system, improvement of cultivation techniques/ management/ production system, and evaluation of available production machineries for irrigated highlands;
- Determination of the optimal level of mechanization relative to rice productivity and competitiveness;
- Development of appropriate, technically feasible, and socially acceptable production machineries;
- Simulation models for forecasting available irrigated rice lands;
- Precision agriculture (e.g. robotics for precision farming and increased efficiency, GIS-based/enabled machines); and
- Utilization of biotechnology tools for increasing yield and qualities.

In the Post-harvest/processing /Marketing components, the research areas to be studied are:

- Needs assessment for post-harvest technologies among stakeholders;
- Development/ Improvement of appropriate, technically feasible, socially acceptable and climate change-resilient post-harvest machinery and equipment (e.g. drying technologies and facilities to lower the drying cost);
- Appropriate product standards development/ updating for locally-produced rice and appropriate packaging materials for prolonged shelf-life;
- Development of value-added products from rice (i.e. traditional/ specialty rice varieties) and the corresponding processing machines needed;

- Analysis of market status and potential of Philippine traditional rice varieties, specialty rice, organic rice, and brown rice (to include packaging and pricing, and promotional strategies for brown rice); and
- Feasibility studies for new assessment of existing alternative marketing systems

For the by-product utilization and waste management, the following researches are to be pursued:

- Development of enterprises and business modules on commercial utilization of rice by-products; and
- Machinery development for commercial utilization of rice by-products.

Under the socio-economics and policy-related researches, these R4D activities are targeted:

- Development of appropriate criteria for prioritizing rice areas relative to enhancing competitiveness;
- Updating of rice statistics (recurrent or periodic);
- Socioeconomic evaluation of a mechanized farm system;
- Assessment of existing land use policy, cost benefit analysis of land conversion;
- Policy study on the integration of Comprehensive Land Use Plan (CLUP) and protected areas;
- Impact assessment of land reform program relative to rice competitiveness;
- Assessment of available credit facilities and crop insurance for farmers;
- Assessment of policy directions on formal and informal seed systems and improvement of seed delivery system;
- Assessment of constraints, and social and economic factors affecting technology adoption;
- Assessment of technology promotion models (e.g. LSTD) and improvement of technology delivery system (e.g. AgRiDOC); and
- Gender sensitivity analysis of developed technologies, farming systems, and enterprises.

As a reference material not only for DA-BAR, but primarily for its partner implementing agencies and institutions, these crafted Rice RDEAP 2016-2022 presents a comprehensive and inclusive agenda and directives that provide guidance and information on where we are, what we have been doing, where we want to go, and what rice R4D activities must be pursued in the next medium term to guide the path towards a competitive, sustainable, and resilient rice industry.

References:

DAR-BAR 2010-2016 Transition Report.2016.

DA-BAR Research and Development, and Extension Agenda and Programs

(RDEAP) 2016-2022.2016.

Fueling Rice R&D for Competitiveness and Sustainability (Reaction Paper)

Flordeliza H. Bordey

PhilRice can contribute to the Research for Development and Extension Agenda and Programs (RDEAP) of the Bureau of Agricultural Research given its Strategic Plan (StratPlan) for 2017-2022.

RDEAP is focused towards three particular goals in the rice sector: a) to develop resiliency of local rice production to climate adversity and trade liberalization; b) to provide decent income for farming households; and c) to sustain industry growth for food security.

The significant strategies of RDEAP can be grouped into four categories, which include a) increase farm productivity; b) diversify farmer income streams; c) pursue market promotion and enterprise development; and d) increase resiliency to climate change. These conquer the whole spectrum of the rice value chain from production to marketing.

Under the roadmap of PhilRice StratPlan for 2017-2022, PhilRice envisions to achieve a rice-secure Philippines by 2022. 'Rice-secure' means rice is accessible, available, and affordable to all Filipinos at all times, in all places. It should also be safe and nutritious.

This translates to the Institute's mission to improve the competitiveness of the Filipino rice farmers and the industry as a whole and transform it to be more profitable, resilient, and sustainable through responsive, balanced, environmentally sound and partnership-based research, development, and extension. In such cases, the similarities between RDEAP and PhilRice StratPlan are noticeable.

By the end of 2022, PhilRice envisions to achieve: a) increased productivity, cost-effectiveness, and profitability of rice farming in a sustainable manner; b) improved rice trade through efficient post-production, better product quality, and reliable supply and distribution system; c) enhanced value, availability, and utilization of rice, diversified rice-based farming products, and by-products for better quality, safety, health, nutrition, and income; d) science-based and supportive rice policy environment; and e) advanced rice science and technology as continuing sources of growth. f) enhanced partnership and knowledge management for rice R4D; and g) strengthened institutional capability. PhilRice needs to strengthen its partnership with other agencies (e.g. DA-BAR) to achieve these desired outcomes.

Each outcome has several strategies or outputs to focus on. For outcome 1, strategies include: a) conserving and profiling of genetic resources; b) developing high-yielding inbred and hybrid varieties with acceptable grain quality, resistance to biotic and abiotic stresses, and adaptability to wider environment; c) developing machines that use renewable energy for land preparation, crop establishment, and crop

care. This puts more emphasis to climate change resiliency; d) improving the existing integrated crop management practices; and e) developing decision support tools for managing soil and nutrient, pest, and water. These strategies and outcomes are also incorporated in the RDEAP of DA-BAR.

For outcome 2, the strategies of PhilRice include developing more compact and cheaper rice combine harvester; developing new generation of climate-resilient dryers to address the changing climate; packaging of information on clustering of varieties for efficient milling; and improving design of mobile rice mills for higher milling recovery.

To achieve Outcome 3, the following strategies are included: to develop rice varieties with value-added traits (i.e. aroma, micronutrient dense, etc.); to improve shelf-life and safety; to develop products with added value from rice and its environment (e.g. biopesticides, biofertilizers, etc.); design machines for rice value-adding and improving quality; and to device multi-functional technologies for diversified rice-based farming system. Diversified farming system will not only focus on rice per se but will also include the combination or integration with other crops.

Outcome 4 intends to focus on policy studies by rationalizing seed production and distribution; promoting mechanization; continuing research on improving access to credit and insurance; recommending interventions and programs to increase yields and reduce cost; analyzing the rice value chain; and crafting policies and ordinances on access/consumption of rice and other staples, and farm waste management.

Outcome 5 focuses more on strategies involving ICT tools and technology as a continuing source of growth. The first strategy is to improve the satellite-based rice mapping with the use of remote sensing technology. This is already an ongoing project, however, there is still a need to dig deeper. Next is to device ICT-based land resource management systems (e.g. aerial vehicle). Another is to develop rice-intel and information system that will integrate the different sources of information. PhilRice also wants to foster the use of robotics and automation, and the use of advance biotechnology solutions. The aim is to address not only the present issues but also the needs of the future.

For the deployment strategy, the Institute plans to develop rice hub and zones. Rice hub is defined as a community of practice geared at developing rice and rice-based industries to address farmers' needs from production and processing to marketing in a resilient and sustainable manner. It is not only developing technologies for production but also deploying it in a market-driven way. To do this, it is essential to develop rice-based enterprises in partnership with other agencies, as well as tailoring the technical capacity enhancement to gear the production system to the demands of the market. The expansion of the market will be called the Rice Zones.

The bottom line is how can the complementation among the rice R4D institutions (i.e. DA-BAR, PhilRice, other rice R&D institutions) be strengthened while avoiding duplication of R4D? One possible approach is to enhance inter-agency coordination among the rice R4D institutions involved. After all, the overall goal is to achieve a rice-secure Philippines.

MARKETING AND TRADE IN PHILIPPINE AGRICULTURE: THE CASE OF RICE

Roehlano M. Briones

Marketing margin is a good indicator of the efficiency in marketing a commodity. The Gross Marketing Margin or M is the difference between wholesale price in pesos per kg of milled rice and the ratio of the farmgate (producer) price in peso over the assumed milling recovery ratio, which is 0.654. A larger margin entails a higher cost of marketing. Likewise, margin is a factor behind competitiveness of rice or the lack of it. Therefore, knowing the margin is one way of assessing the marketing efficiency of rice.

$$M = WP - \frac{FP}{0.654}$$

The study by Beltran et al (2016) made a benchmark for comparison of the margin found in other rice producing countries in the region. It provided estimates of the margin, broken down into its components for several countries in Southeast Asia, namely: Philippines, Indonesia, Thailand, and Vietnam.

For each country, the major rice producing area was considered for the estimates. As seen on Table 1, Philippines has the largest margin. Furthermore, it was 62 percent higher than Indonesia, which had the second highest margin among the group. Using the comparison of the Philippines with each country above, the following observations can be seen:

- Vietnam has lower cost for each component except drying and storage
- Philippines has lower cost compared to Vietnam for drying, transport, storage, and working capital but has a higher cost in milling and packing. Taking all these into account, Philippines has a larger margin than Vietnam.

Table 1: Differential margins and marketing costs, by function, in pesos per kg milled rice.

					PH VERSUS		
ITEMS	**PH**	**IDO**	**TH**	**VN**	**IDO**	**TH**	**VN**
GMM	9.06	5.61	5.27	4.55	3.45	3.79	4.51
Total marketing	4.63	4.97	2.73	3.78	-0.33	1.90	0.85
Drying	0.26	0.62	0.33	0.52	-0.36	-0.07	-0.26
Transport	2.09	2.22	1.08	1.76	-0.12	1.01	0.33
Milling	1.38	1.22	0.89	0.93	0.16	0.49	0.45
Storage	0.19	0.4	0.2	0.23	- 0.21	- 0.01	-0.04
Packaging	0.45	0.24	0.14	0.22	0.21	0.31	0.23
Working cap	0.27	0.28	0.09	0.11	- 0.01	0.18	0.16
Residual	4.43	0.64	2.54	0.77	3.78	1.89	3.66
Residual, share in GMM (%)	49	11	48	17	110	50	81

Note: PH – Philippines; IDO – Indonesia; TH – Thailand; VN – Vietnam
Source: Beltran et al (2016)

Looking at the components of the margin for Philippines, it can be seen that residual is the highest component, accounting for almost half of the total margin. One hypothesis is that this was caused by a large number of middleman working closely with rice cartels, which control 90% of the country's rice supply (Tadem, 2002). However, other existing literatures debunk this view. Evidences from past researchers (Mangahas and Recto, 1966; Hayami and Kikuchi, 2000; de la Pena, 2014) all showed a high degree of competition as opposed to the cartelized market. Furthermore, a study by Rufino (2008) found out that despite the geographic differences and distances, price signals and other market information are transmitted efficiently across the markets and therefore, negating the possibility of unexploited arbitrage opportunities.

Was the margin always this large?

The margin started out much smaller at only P3.40per kg in 1990 compared to P6.10/kg in 2015. As seen on Figure 1 below, increases in domestic prices (1995, 2008, 2012) resulted in an increase in margin. It turns out that increases in the margin coincide with price spikes. Furthermore, it can be seen that it takes a long time for margins to decline after a price spike. After 1995, margins fell back only to 1993 levels by 2006. The margin then recovered quickly with the price increase of 2008, before falling off and recovering yet again in 2012-13.

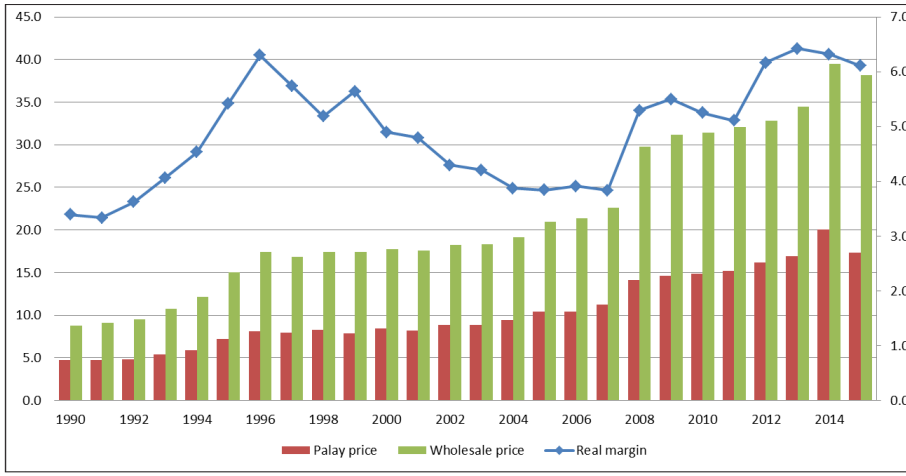

Figure 1. Prices of *palay* and milled rice (in pesos per kg) and the real marketing margin (%)
Source: PSA (2016)

Figure 2 further examines the seasonality of prices. Seasonal patterns are more pronounced on farmgate prices as compared with wholesale prices. Also, wholesale prices behave more slowly month-to-month compared with palay prices. The coefficient of variation of the average monthly wholesale price is 2.5 compared with 3.9 for *palay*. The seasonal pattern is consistent with the theory that traders are able to stabilize prices since they have better access to transport and storage services and

have higher working capital. On the other hand, farmers tend to sell their produce soon after harvest rather than to keep their harvest in storage and wait for a better price at off-peak season.

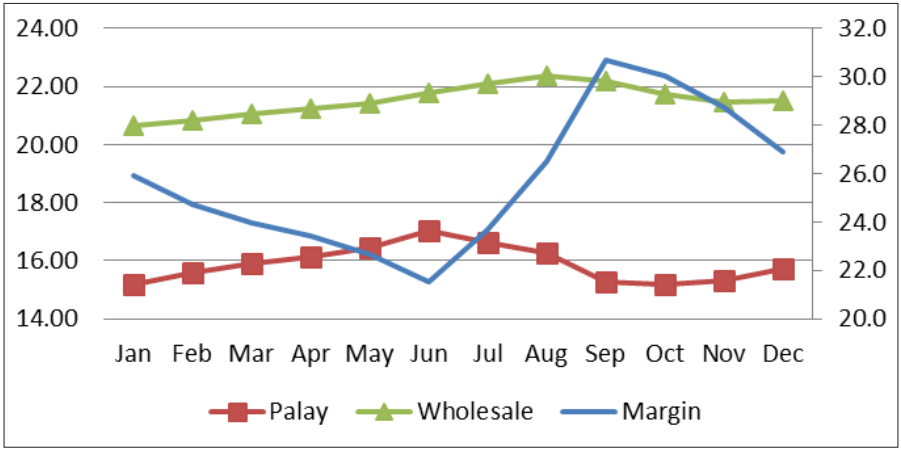

Figure 2. Average monthly *palay* farmgate and rice wholesale prices (in pesos per kg) and their relative margin (%), 1990-2015.
Source: PSA

Therefore, the large margin of wholesalers is due to their comparative advantage in spatial and temporal arbitrage. Furthermore, traders capture greater gains from year-to-year price volatility compared to farmers. Large margin exists because trading rice successfully requires a marketing agent to have local knowledge and network with farmers (Dawe et al, 2003), as well as considerable outlays of cash.

How can the margin be reduced?

Different policies influence the size of the margin, namely:

- Trade policy – currently, the country is implementing quantitative restrictions (QRs) and state monopoly in rice importation;
- Investment policy – currently, the country is imposing nationality restriction, i.e. rice trade and processing is open only to Filipino-owned firms (maximum 40% foreign-owned);
- Investments in marketing efficiency – these include interventions to raise quality of *palay* (e.g. mechanical dryers), investment in transport infrastructure (roads and railways), investment in logistics mechanization (e.g. in loading and unloading trucks), and established *palay* wholesale markets (Beltran et al, 2016).

Brief assessment of these various policies is discussed below. For the last policy (investments in marketing efficiency), we focused solely on investments in *palay* wholesale markets.

Trade policy

The option for trade policy to reduce the marketing margin is to liberalize rice importation, and convert protective measures into tariffs. Under the current World Trade Organization commitments, the government is scheduled to undertake this liberalization on July 2017. Even with 35% tariff (as advocated in Briones and Tolin,. 2015), domestic prices are likely to fall, along with the margin. This, of course, will be favorable to the consumers. However, this will be unpopular with the rice industry, (i.e. farmers, traders, and millers). On the plus side, intensified competition will force the exit of inefficient players and accelerate adoption of modern practices and technologies for the survivors.

Investment liberalization

Another option is to liberalize entry of foreign-owned firms into processing and trading. It is unlikely though that foreign-owned firms will venture into dependent trading, given the lack of familiarity of foreigners with the local rice market. Most likely, they will focus on investment in modern rice mills and procure *palay* through local traders. To optimize their mills, they may insist on higher quality standards. Entry of foreign-owned firms will likely be favorable to domestic farmers, traders, and consumers. However, this policy will be unfavorable to millers.

Establishment of wholesale markets

In Thailand, the government has helped in setting up a system of central paddy markets in main production areas. Facilities provided include moisture gauges, drying lawns, warehouses, and finance. Most centers are supported by the Ministry of Commerce. Many are government-owned under the Department of Agricultural Extension, Ministry of Agriculture and Cooperatives (Wiboonppongse and Chaovanapoonphoi, 2011).

Similarly, in the Philippines, establishment of wholesale *palay* centers should come as a package, [i.e. enforcing grades and standards (as is done by the National Tobacco Administration in the case of tobacco]; weighing and drying facilities; and storage facilities, e.g. grain silos as in Vietnam)]. The wholesale centers can also introduce a system of warehouse receipts ("quedan") to support temporal arbitrage of farmers (i.e. they can borrow money with quedan as collateral, avoiding the need to sell *palay* at peak season). The centers can also post prices in other centers, thereby improving spatial arbitrage for traders and indirectly, for farmers as well.

In the Philippines, instead of investment in *palay* wholesale markets, the government through the National Food Authority (NFA) has opted to set up direct buying stations. In fact, it has been reluctant to promote activities of traders, as these compete directly with government commercial activities. Despite its mandate under PD 4 to introduce warehouse receipts as well as grades and standards, the government has been reluctant to do it, so it will likely raise its own operating costs.

Fortunately, under the current administration, reform is underway towards separating the marketing and regulatory function of NFA (as a regulatory entity). Therefore, it will focus on introducing grades and standards for *palay*, as well as a warehouse receipt system. A separate entity authorized to do commercial activity can focus on buffer stocks and modernization of grains marketing, including investments in wholesale *palay* centers. Initial investments can be done by government as a whole or as PPP. The rice trading arm of government can operate the wholesale center directly, or outsource its management to the private sector.

Conclusion

The marketing system for *palay* in the Philippines is inefficient. One reason is the backward marketing system that compels farmers to sell *palay* for cash during harvest, leaving wholesalers to reap the greater benefit from price fluctuation. Inefficiencies are further perpetuated by trade protection and conflict of interests at the core of NFA. Reforms should be pursued in terms of import and investment liberalization, as well as investment in wholesale *palay* centers.

Marketing and Trade: A Reaction Paper

Isabelita M. Pabuayon

The paper "*Marketing and Trade*" by Roehlano M. Briones focuses on the analysis of marketing margin for rice as a measure of marketing efficiency, and options for improving the rice marketing efficiency via reduction in marketing margin.

In analyzing the size of the margin, it is useful to understand what happens when the margin increases (or decreases), or what is the effect of having a large (or small) margin, or who benefits (or loses) from a large (or small) margin. From the formula,

$$M = WP - \frac{FP}{0.654}$$

Where *WP* is wholesale price of rice, *FP* is farmgate price of *palay*, and 0.654 is the assumed milling recovery. Thus, the per unit margin (pesos per kg of milled rice) is the difference in prices at the farm and wholesale markets in rice equivalent (note that the concept of margin can be applied between any two points in the marketing chain).

The formula suggests that *M* becomes larger when *WP* (selling price of the wholesaler) is higher and *FP* (buying price of wholesaler or selling price of the farmer) is lower. In that case, the wholesaler gains while the farmer loses; other things being held constant. *M* is smaller when *WP* is lower and *PF* is higher; the case when the wholesaler loses and the farmer gains. Since *WP* is directly related to *RP* (retail price or consumer price), the larger margin also means that the consumer loses (since the selling price of the retailer is the buying price of the consumer). Conversely, consumer gains from a smaller margin.

What is the composition of the margin? The margin has two components: the marketing costs and the net return or profit of the trader (wholesaler in this case). Under competitive conditions, marketing costs are the minimum real costs of performing all marketing and value-adding activities, and profit is at normal level (Pabuayon, et al 2013). Thus,

$$M = MC + \pi$$

Where *MC* is marketing and value-adding costs, and π is normal profit.

Thus, a large margin means that either the marketing costs are high (marketing operations are not efficiently done or more marketing services are demanded and supplied) or there is above-normal profit, or both. Improving operational efficiency will reduce costs, and eliminating market imperfections with associated market power will avoid existence of above-normal profit thus, pushing the margin to its minimum

size. This will mean a lower wholesale price (and retail price) and/or a higher farm price. Both consumers and farmers benefit. The trader becomes efficient and gets normal return from the use of his resources. A more equitable distribution of income may be possible. Consumers become food-secure (as food becomes affordable) and farmers' income increases. Efficient traders will continue to operate as they gain profit based on the opportunity costs of their resources. Inefficient traders will leave rice trading and consider other business options with societal interests for farmers, consumers, and market intermediaries, with the latter getting reasonable returns from their investments.

Based on the comparative data among four countries, namely, Philippines, Indonesia, Thailand, and Vietnam, it was concluded that Philippines has the largest marketing margin with P9.06/kg compared with P5.61 for Indonesia, P5.27 for Thailand. and P4.55 for Vietnam. Comparing cost items with Vietnam, costs are higher for transport, milling, and packaging (not drying, in fact, drying cost is lowest in the Philippines among the 4 countries, see page 3). The residual (GMM less total marketing costs) is also much higher in the Philippines.

What is the residual? From the above formula, this may refer to the profit component unless there are other cost items such as allowance for risks. If this is pure profit and rice trading is riskless, it is indeed quite large (49% almost similar to Thailand's 485) and may suggest above normal profit. If much of this residual is risk, it implies that rice trading is a relatively risky business and this points out to various market-constraining factors, policy-related or otherwise.

Transport is the biggest cost component at P2.09/kg, which is about 45% of the total marketing cost component. This reflects the inherent transport infrastructure problems for an archipelago like the Philippines. The same is true for Indonesia with P2.22/kg, also 45% of total marketing cost. If all the major cost items could be reduced through improvement in transport, milling, and packaging operations, the margin can then be reduced.

Can the large profit component be reduced? Above-normal profit is associated with uncompetitive market structure. However, studies have shown that generally, the Philippine rice market is competitive. There are no cartels, no market power, etc, and that paired rice markets are spatially integrated indicating efficient price transmission from one market to another. The same studies though did not discount the possibility of pockets of cartelized markets and localized market power. Market integration studies (for example, Rufino 2008) also show that certain paired markets are not integrated. Likewise, Dawe et al (2008) as cited in Briones and Dela Pena (2015) implied the existence of excess profits in the Philippines owing to the large differences in the net margins of Philippines and Thailand, and that collusion may exist (although there is no clear evidence) among very large traders operating in wholesale markets.

A number of other things may be noted from such studies. First, studies are focused on specific areas. For example, the study of Beltran, et al (2016), which is the source of Table 1, is only for the market channel of irrigated rice from Nueva Ecija– only one of the major producing areas in the country with 8.71% share. For 2015, based on PSA data, the top five regions in *palay* production are Central Luzon

(18.21% share), Cagayan Valley (13.72%), Western Visayas (11.33%), Ilocos region (9.79%), and SOCCSKSARGEN (7.12%). Altogether they compromise 60.26% of total *palay* production. A comparative analysis for these regions would give a more comprehensive picture of Philippine rice markets while analysis of specific market levels along the entire supply/value chain will indicate comparative degrees of competition. While the farm-level market may be competitive (e.g., characterized by numerous farmer-sellers as well as agents, consolidators, and millers representing the buyers), the same cannot be said at the wholesale rice market, which is characterized by very large traders and wholesalers who have much access to capital, information, and superior entrepreneurial skills.

Second, these studies (for example, Beltran et al 2016; Briones and Dela Pena 2015) do not analyze the profit component (possibly using a simple ROI) and to what extent this deviates from the opportunity cost of capital (an approximation of normal return).

Third, when market integration studies conclude that price transmission is efficient, this simply means that prices are statistically aligned with market pairs (short or long run). Such studies, which are only based on time series (farm, wholesale, and retail) price data, do not analyze the marketing cost and profit components of margin (based on surveys), which should give a complete picture of marketing efficiency.

Lastly, it is not clear whether the implied long-run equilibrium indeed translates into the minimum margin, the case of being able to pay for the pure costs and intermediaries getting normal profit (a reasonable entitlement).

It was pointed out that large margins occur after each price spike (and persist over relatively long periods of time) and seasonally, in specific months when farm prices are low in September and October, at which time wholesale prices are also relatively high. When farm prices start to rise in the lean months starting from May until July-August, margins are relatively low. This means that margins are not stable throughout the year, which results from the usual price seasonality owing to seasonal plantings and harvests. Wholesalers are able to take advantage of temporal arbitrage (buying at low prices and selling at favorable prices with withdrawal of stocks properly synchronized according to demand requirements of consumers). Unfortunately, while the market intermediaries are able to even out supply at the wholesale and retail levels through efficient storage, farmers are not able to do so owing to cash needs at harvest time and thus, subject to severely low farm price.

The following recommendations of the author are appropriate. I will make some elaboration.

a) Trade liberalization (lifting of QRs) and maintaining protection through tariff will reduce marketing margins by lowering wholesale and retail prices. Inefficient traders including millers and wholesalers will leave the industry, and those left out will further strive to be efficient, thus lowering marketing costs and pushing profits to normal levels. The immediate effect may be lowering farm prices since traders would buy less from farmers when imported rice is cheaper. Rice farmers are likely to be hurt initially, but if given the necessary support services (e.g., agricultural insurance,

inventory financing like quedan, post-harvest facilities, and organizational support for collective action through cooperatives and other farm organizations), they may be able to recover from the unfavorable price situation. Collective action among farmers could strengthen their bargaining position vis-à-vis traders, hence, leading to a more balanced market power between buyers and sellers. Adequate production support (irrigation, quality seeds, and technologies) could raise farm yields from the current 3.8mt/ha to 6-7mt/ha. If rice intensification happens (whether through increase in output per unit area, per unit time or higher cropping intensities), the lower farm price may be offset by the higher yields resulting in higher revenues. Over time, inefficient farmers may shift to high value crops (pineapple, banana, coconut, mango or even aquaculture like milkfish) that have comparative and competitive advantage (Briones 2012). A structural transformation of Philippine agriculture involving diversification towards high-value commodities, and value-adding agribusiness and markets might be possible (UPLB 2016).

b) Investment liberalization involving entry of foreign investments for modernization and integration of post-harvest operations (drying, milling, packaging, and bulk handling) could lower marketing costs and improve product quality. This could result in lower margins with benefits accruing to consumers and farmers as well if far, markets are competitive.

c) Establishment of wholesale markets with modern storage, grading, weighing, and information facilities will bring about a competitive market place among rice buyers and sellers including farmers. The latter, through organized and collective action and cooperation, could achieve economic scale of operations involving large marketable surplus, bulk handling, and transport arrangements. For farmers to participate actively and benefit from the establishment of wholesale markets, they need to be organized and pool their resources together not only to do collective selling but also transform their farm organizations into an agribusiness operation, possibly having the capacity to 'control' and manage supply with countervailing market power against the big players in the rice market. Other business opportunities could include value addition (quality control; improved packaging; producing alternatives to white rice, brown rice, organic rice, rice-based snack foods; and linking to institutional and niche markets).

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TOWARDS A MORE RESILIENT AND COMPETITIVE PHILIPPINE RICE INDUSTRY: THE EXTENSION AGENDA

Eliseo R. Ponce and Arlene B. Inocencio

Rice in Filipino Diet and How Much Do Filipinos Pay for Rice

Rice is the most important staple and it constitutes a big part of the family budget. On the average, 37% of the total daily per capita intake of a regular Filipino is comprised of rice and related products (Figure 1). Moreover, rice is considered as the most important source of carbohydrates for Filipino. Out of the mean one-day per capita food intake of a regular Filipino, 37% out of the 44% total daily carbohydrates intake come solely from rice. Far second to rice are fish, meat, and poultry products, followed by vegetables.

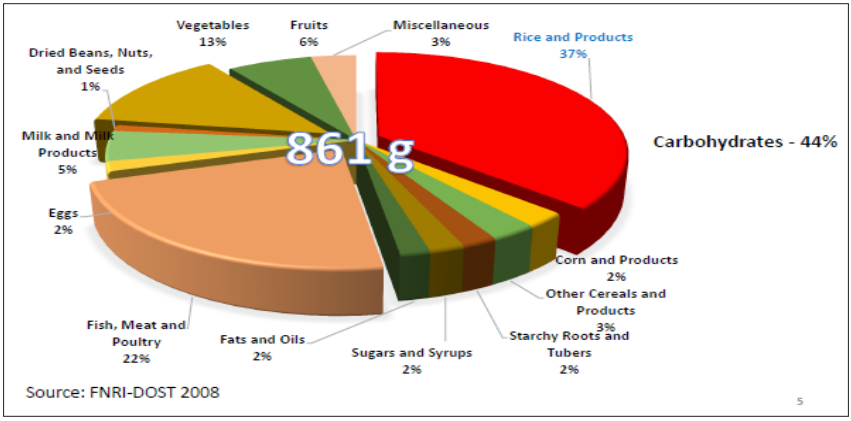


Figure 1. Average Daily per Capita Food Intake by Food Groups, Philippines, 2008.

For 80% of Filipino families, food accounts for over 50% of the household's total expenditure. For the lower income groups 60% of their income is for food. Meanwhile across income classes, rice expenditure ranges from 22% to 31% for the bottom four quintiles of households as shown in Table 1. On the average, rice expenditure accounts for roughly one-fifth of the total family food expenses.

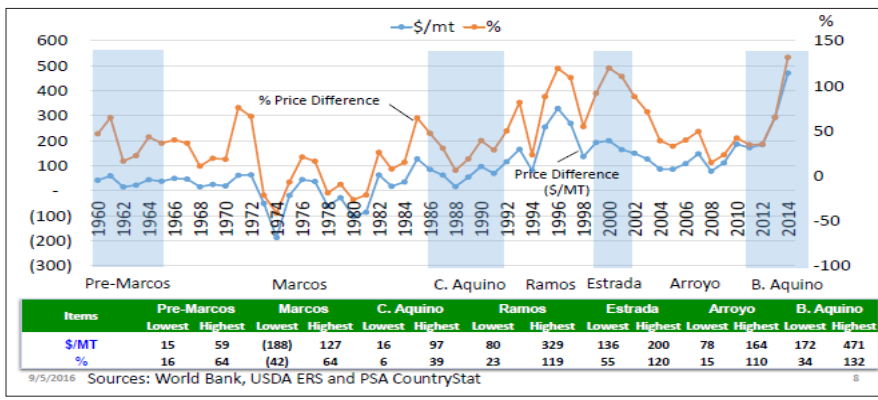
Table 1. Bread and Cereals in Family Food Expenditure, 2012

Items	All Income Class	Income Class				
		Under 40,000	40,000 59,999	60,000 99,999	100,000 249,999	250,000 and over
Food Expenditure (P Mn)	1,765,634	14,042	46,767	192,833	677,073	837,475
Bread and Cereals	28	42.2	43.7	41.1	31.3	20.9
(% to Total Food Expenditure)						
Rice Expenditure (%)	19.9	30	31.1	29.3	22.3	14.9
Corn Expenditure (%)	1.2	1.8	1.8	1.7	1.3	0.9
Flour Expenditure (%)	0.1	0.1	0.2	0.1	0.1	0.1
Other cereal preparation (%)	1.5	2.2	2.3	2.2	1.7	1.1
Bread Expenditure (%)	4.3	6.4	6.6	6.2	4.8	3.2
Pasta Expenditure (%)	1	1.6	1.6	1.5	1.2	0.8
Other bread expenditure(%)	0	0	0	0	0	0

Source: NSO, 2012 Family Income and Expenditure Survey

Wedge between world and domestic is penalizing the poor

The difference between domestic and world prices of rice for over five decades is shown in Figure 2. Except for a few years, domestic prices have been higher than world prices. With rice comprising a big part of the household budgets, the consumers bear a great impact on the government's rice policy. Given that the poor spends more on rice, the government price policy, unfortunately, has the unintended effect of penalizing the poor as it resulted in higher domestic prices.



Items	Pre-Marcos		Marcos		C. Aquino		Ramos		Estrada		Arroyo		B. Aquino	
	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest	Lowest	Highest
$/MT	15	59	(188)	127	16	97	80	329	136	200	78	164	172	471
%	16	64	(42)	64	6	39	23	119	55	120	15	110	34	132

Figure 2. Philippine Domestic Rice Price vs. World Price, 1960-2014.

Estimates of the burden to Filipino consumers owing to the higher cost of domestic rice indicate that these are very substantial ranging from P65 billion to P127 billion per annum (Table 2). The differential cost between world price and domestic price was highest in 2003 reaching 42%. It should be noted that the 2012 cost at P91 billion is 1.5 times higher than the P61 billion budget of DA and its attached agencies for that

year. The Filipino consumers are paying for higher domestic cost of rice since 1960. Compared to 2003, consumers spent 2.85 times more in 2006, 3.88 times more in 2009, and 2.24 times more in 2012.

Table 2. Estimated Costs to Households of the Price Wedge, 2003-2012.

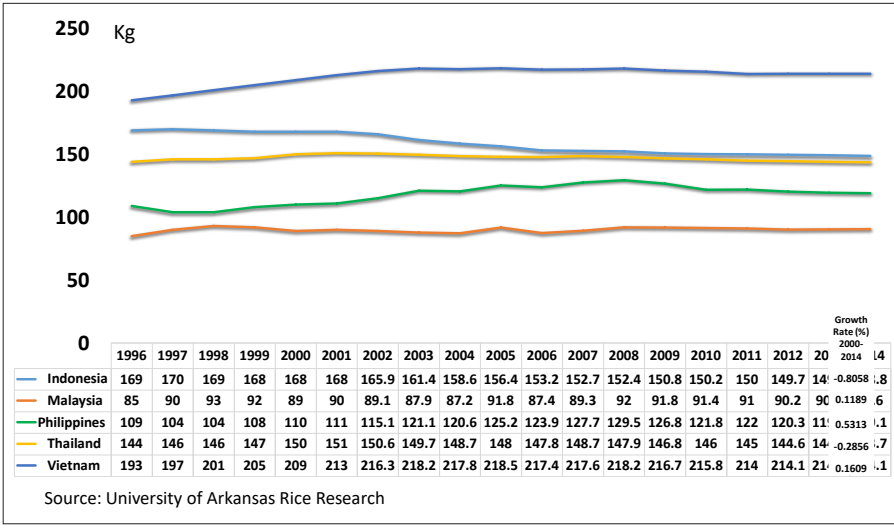
Items	All Income Class			
	2003	2006	2009	2012
1. Domestic Price (Php/MT)	16,510	19,490	28,250	30,040
2. World Price (Php/MT)	9,654	13,956	22,950	22,266
3. Annual Consumption* (MMT)	9.49	22.9	21.53	11.7
4. Family Total Annual Rice Expenditure at Domestic Price (Php M)	156,717	446,240	608,331	351,511
5. Family Total Rice Expenditure at World Price (Php M)	91,634	319,542	494,197	260,546
6. Difference (Php M): (4) – (5)	65,083	126,698	114,135	90,965
7. % Difference	42	28	19	26

Sources: FIES 2003, 2006, 2009 & 2012, World Bank, USDA ERS, PSA CountryStat

Note: World Price (35% broken – more conservative price than the 25% broken); Domestic Price (Regular Milled Wholesale); *Estimated national rice requirement as food based on FIES data

Increasing rice consumption

Of the five countries included in the graph (Indonesia, Malaysia, Philippines, Thailand, and Vietnam), Philippines is 2nd to the last when it comes to the lowest per capita rice consumption following Malaysia, which took the last place. However, from 2000-2014, the per capita consumption of the Philippines has been growing more than three times compared with Vietnam while those of Indonesia and Thailand are declining (Figure 3).

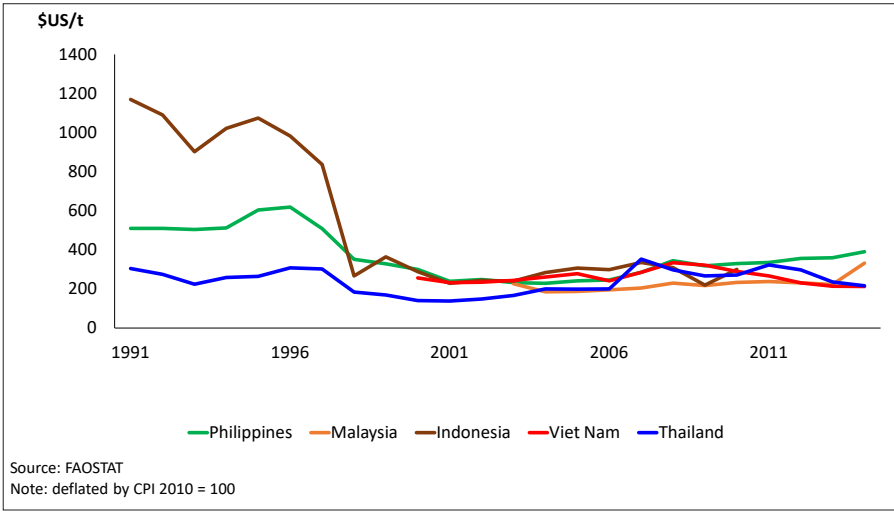


	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	20	Growth Rate (%) 2000-2014	4
Indonesia	169	170	169	168	168	168	165.9	161.4	158.6	156.4	153.2	152.7	152.4	150.8	150.2	150	149.7	14	-0.8058	.8
Malaysia	85	90	93	92	89	90	89.1	87.9	87.2	91.8	87.4	89.3	92	91.8	91.4	91	90.2	9	0.1189	.6
Philippines	109	104	104	108	110	111	115.1	121.1	120.6	125.2	123.9	127.7	129.5	126.8	121.8	122	120.3	11	0.5313	.1
Thailand	144	146	146	147	150	151	150.6	149.7	148.7	148	147.8	148.7	147.9	146.8	146	145	144.6	14	-0.2856	.7
Vietnam	193	197	201	205	209	213	216.3	218.2	217.8	218.5	217.4	217.6	218.2	216.7	215.8	214	214.1	21	0.1609	.1

Source: University of Arkansas Rice Research

Figure 3. Trend in Per Capita Rice Consumption of Selected ASEAN Countries.

Looking at the paddy price trends of selected ASEAN Countries (Figure 4), Philippines has the highest price among all selected countries for the recent years. Furthermore, even in 1991, the country has the second most expensive paddy next to Indonesia.



Source: FAOSTAT
Note: deflated by CPI 2010 = 100

Figure 4. Paddy Price Trends of Selected ASEAN Countries, 1991-2014.

The National Rice Program and its Performance from 1986 to 2016

Rice Sector Performance under Various Administrations (1986-2016)

For a period of 30 years (from Cory Aquino to B. Aquino), the government only achieved rice self-sufficiency in three years, 1991, 1992, and 1994. This translates to 10% success rate. From 1994 to 2015, the self-sufficiency ratio ranged from 72.05% in 1998 to 96.81% in 2013. Excluding the effects of "El Nino" in 1998 from the computation, the self-sufficiency ratio of the country stood at an average of 91.59% during the last 26 years (1988-2014)

In pursuit of the goal of rice self-sufficiency, administrations since President Cory Aquino established yield targets for both irrigated and rainfed rice. The yield target success rate for irrigated rice is zero and the 27% for rainfed rice (Table 3). The very low success rate of National Rice Program (NRP) to attain its yield and production targets raises two critical issues. First, the methodology to predict NRP's yield and production targets is not clearly articulated. Second is the ability of the rice research and extension system of the country to bring about the required improvements in the technical efficiency of rice production as a means to raise productivity and total production to meet the NRP targets.

Table 3. National Rice Program Performance, 1986-2016

Administration	DA Secretary	Programs	Year	Accomplishment				
				Yield Attainment Success Rate (%)		Self-sufficiency Ratio (%)		
				Irrigated	Rainfed	High	Low	Ave.
C. Aquino	R. Mitra	Masagana 99	1986-1987	0%	0%	100.6	91	97.1
	C. Dominguez	RPEP 1 & 2	1987-1989					
	S. Bacani	Rice Action Prog.	1990-1992					
F. Ramos	R. Sebastian	Key Prod'n Areas	1992-1996	0%	67%	100	72.1	91
	S. Escudero	Gintong Ani-Prog.	1996-1998					
J. Estrada	W. Dar	Agriculturang Makamasa Program	1998-1999	0%	0%	92.7	90.2	91.5
	E. Angara		1999-2001					
	D. Panganiban		2001					
G. Arroyo	L. Montemayor	GMA-CARES	2001-2002	0%	0%	91.3	81.3	86.4
	L. Lorenzo Jr.		2002-2004					
	A. Yap		2004-2005					
	D. Panganiban		2005-2006					
	A. Yap		2006-2010					
	B. Fondevilla		2010					
B. Aquino	P. Alcala	Agri-Pinoy/FSSP	2011-2016	0%	80%	89	96.8	92.8

Sources: DA National Rice Program, BAS data, PSA Country Stat

High self-sufficiency ratios. The respective self-sufficiency ratios for each rice program are shown in Table 3. The ratios had been quite high in late 1980s to mid-1990s at over 90% and even reached 100% in 1991 and 1992. The ratio was lowest in 1998 as a result of the worst El Niño episode the country experienced in 1997. The years spanning the Arroyo administration had the lowest self-sufficiency ratios. In fact, starting 2002, the rice imports already reached 1M tons. From 2005 to 2010, the average annual rice import was close to 2M tons (Virola 2011). During the global food crisis in 2008, the country imported a record of 2.34 million tons of rice, deemed the largest for any country.

Self-sufficiency ratio is defined as production divided production plus net imports.

Figures 5a to 5c clearly show the size of the gaps between the targets of the NRPs and the actual palay yields over time and by production environment across different administrations. The very high targets during C. Aquino up to Estrada administrations are notable leading to the bigger gaps for years 1986 to 2000 except in 1993 to 1994. The targets for the succeeding administrations had been more modest but performance continued to fall short.

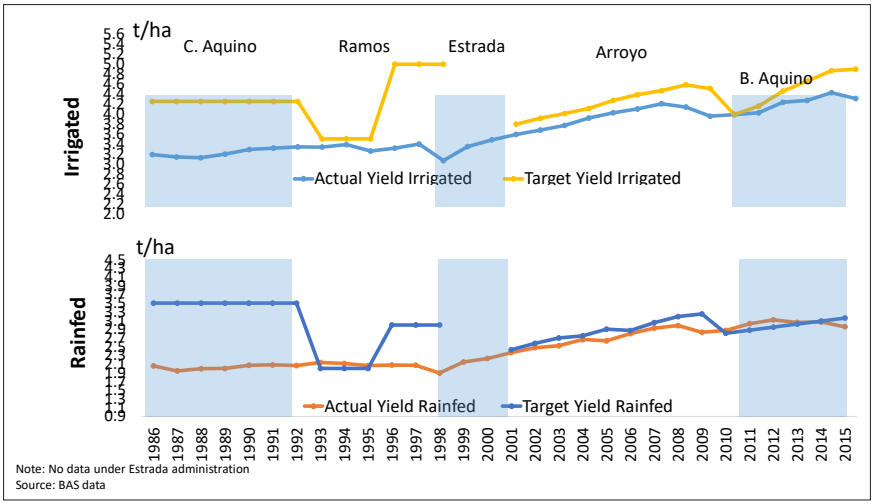


Figure 5a. Trends in Target vs. Actual *Palay* Yields, 1986-2015

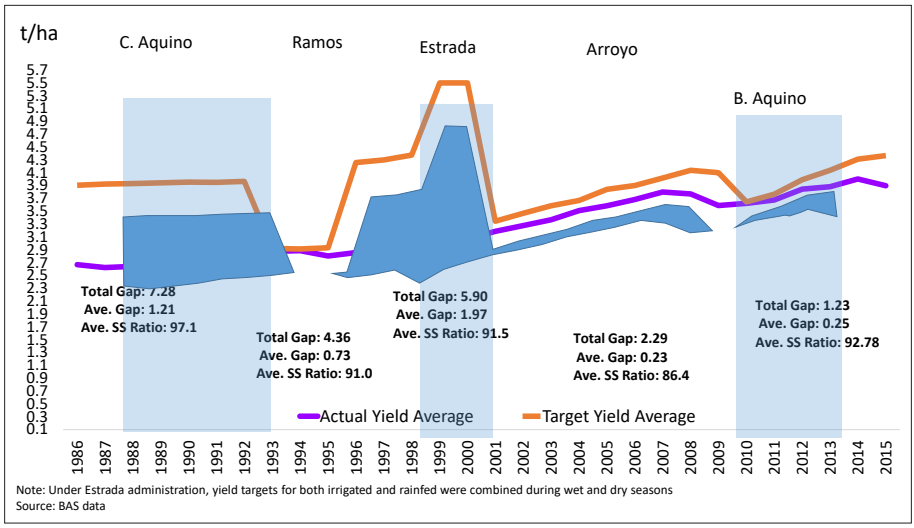


Figure 5b. Trends in Palay Yield Targets vs. Actual; Average Yield Gap by Administration, 1986-2015

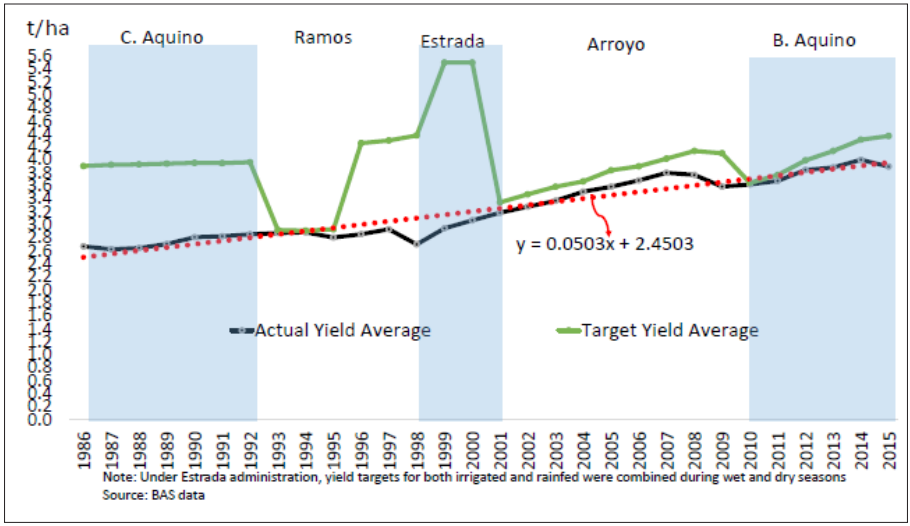


Figure 5c. Comparison of Yield Targets vs. Actual Yields: All Environments, 1986-2015

Comparing the average yield targets versus the actual yields across administrations from C. Aquino to B. Aquino, it appears that from 1986 to 1998, the yield targets were way off except during a period of three years from 1993 to 1995.

It is noticeable that the gap between targets and performance in the last two administrations was low, perhaps indicating some learnings from the methodology of target setting, which have not been dealt with in the NRP accomplishment reports or in its monitoring and evaluation.

The continued focus by NRP on rice self-sufficiency raises an important issue on planning the development of the rice sector. The target outcomes for the rice sector development have been defined by Executive Orders (EO) 116/292 in the creation of the Department of Agriculture, (i.e., farmers' income and job generation). At the same time, the EO spelled-out the major tasks or outputs of DA in pursuit of the agriculture development goals: provision of support services, investment, and improvement of the policy environment (Table 13 and Table 14). Therefore, the NRP should focus on these mandated targets outcomes and the means or outputs to achieve them in the planning, implementation, and evaluation.

Making yield and production targets as the key outcomes of the NRP can be considered misleading and inappropriate in many dimensions. Yield and production targets are not the sole outputs or direct outcomes of government interventions. Furthermore, uncontrollable external factors greatly affect the yield and production. Environmental factors such as the weather or climate, which are outside of the government's control, play an important role on rice performance. Besides, by focusing on rice self-sufficiency, the NRP veers away from what is truly important based on EOs 116/292: income and job generation. It also veers away from Republic Act (RA) 8435 whose development focus includes: food security, poverty alleviation, global competitiveness, and sustainable development. Examining the NRP plans of the various administrations shows that the outputs and outcomes of EOs 116/292 and RA 8435 have been given superficial attention. NRP plans have always focused on rice self-sufficiency and the corresponding yield and production targets.

The graph on yield targets versus actual yields as reflected in the NRPs under different administrations are shown in Figure 5a for irrigated rice and rainfed rice, and Figure 5b for both environments. There appears a wide gap between targets and actual yields achieved in the government rice programs from 1986 to 2001. Thereafter (2001-2015), the gap has become smaller, perhaps more reasonable. During the period spanning 28 years, the government did not meet its yield target in the irrigated areas. However, in the rainfed areas, the government rice program met some success in seven out of 28 years: Ramos for three years and B. Aquino for four years.

Comparing the average yield targets versus the actual yields across administrations from C. Aquino to B. Aquino, it appears that from 1986 to 2001, the yield targets were way off except from 1993 to 1995, a period of 3 years.

Trends in Palay Yields, Area and Production

Figures 6a to 6c showed the trends in *palay* yields, area, and production. Total area harvested is increasing at an average of 30,250 ha annually from 1970 to 2014. This growth is largely contributed by the expansion in irrigated rice, which is increasing at the rate of 45,600ha per year. This increase is partly offset by the decrease in rainfed areas. Comparing all administrations, growth in area harvested is highest during the Ramos administration with 3.98% followed by B. Aquino with 2.16%.

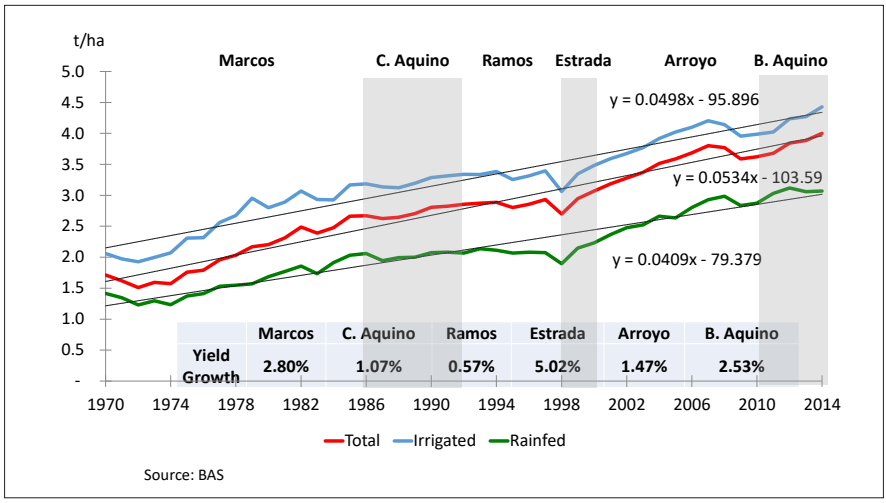


Figure 6a. Trends in *Palay* Yields by Production Environments, 1970-2014

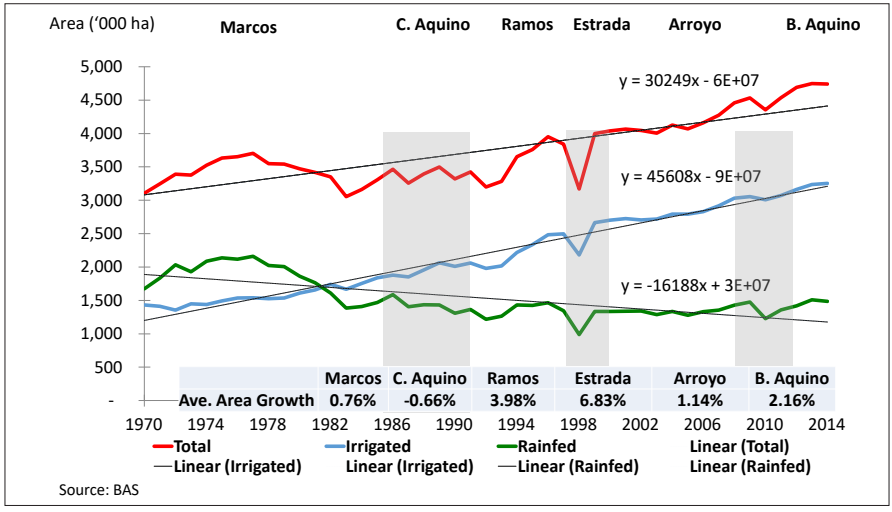
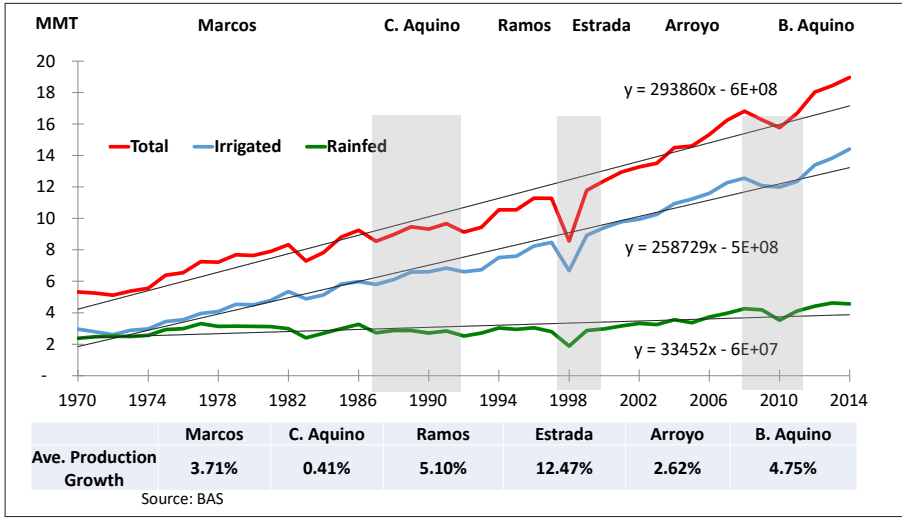


Figure 6b. Trends in *Palay* Area Harvested, 1970-2014



	Marcos	C. Aquino	Ramos	Estrada	Arroyo	B. Aquino
Ave. Production Growth	3.71%	0.41%	5.10%	12.47%	2.62%	4.75%

Source: BAS

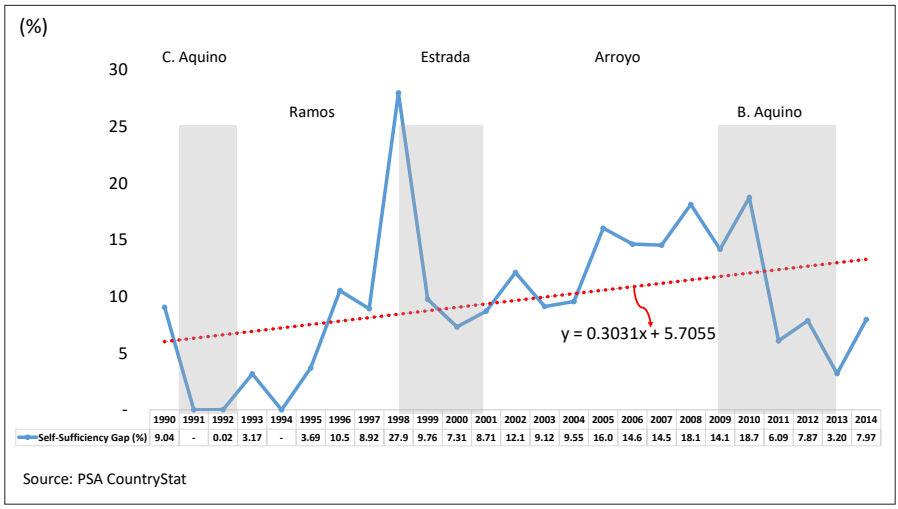
Figure 6c. Trends in *Palay* Production by Production Environment, 1970-2014

Yields of irrigated area, as expected, are at least 1-2t higher than rainfed areas. After the Marcos era, yield growth had been highest in the last five years at an average of 2.5%, counting out the Estrada administration owing to the effect of El Nino in 1998 (Figure 6a).

The total production has been increasing at an average of 294,000 t/year from 1970 to 2014. Nonetheless, the total production is still lower than the FSSP target of 22.71M tons by 2016. The growth can be largely attributed to the expansion and increasing productivity of irrigated areas. It is notable that production growth during the Arroyo administration had almost doubled during the Aquino administration.

Yield increase is small in all production environments. Comparing all administrations from 1970 to 2014, excluding Estrada's because of the effects of El Niño, the highest annual average yield growth occurred during the Marcos era with 2.80% followed by B. Aquino with 2.53%. The yield improvement was higher in rainfed than irrigated rice. The annual rate of yield increase is slightly higher in irrigated than rainfed rice.

Figure 7 gives the rice self-sufficiency gap (defined as the deficit or shortfall in self-sufficiency or 100% less the self-sufficiency ratio) from 1990 to 2014. The trend analysis showed an increasing pattern with an annual increase of 0.3%. However, in the last four years, a decline in the self-sufficiency gap is apparent. This decreasing pattern is perhaps a function of the government's massive funding support to attain rice self-sufficiency.



	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Self-Sufficiency Gap (%)	9.04	-	0.02	3.17	-	3.69	10.5	8.92	27.9	9.76	7.31	8.71	12.1	9.12	9.55	16.0	14.6	14.5	18.1	14.1	18.7	6.09	7.87	3.20	7.97

Figure 7. Rice Self-Sufficiency Gap: 1990-2014

As of 2013, the year B. Aquino administration targeted 100% self-sufficiency in rice, the country's self-sufficiency level stood at 96.8%. This is 24.76% higher compared with the lowest self-sufficiency level in 1998 when the country suffered its worst rice harvest as a result of El Niño in 1997. It is interesting to note that the rice self-sufficiency gap was lowest during the C. Aquino administration and highest during the G. Arroyo administration. Substantial improvement has been achieved during the B. Aquino administration.

The fixation with rice self-sufficiency should be noted that among the ASEAN neighbors, only Malaysia, Brunei, Singapore, and Philippines are not rice self-sufficient (Table 4). Yet, all these countries except Philippines consider themselves food-secure. In fact, Singapore that has no agriculture, is rated as the second most food-secure country in the world (Habito, 2016). Philippines' continuing pursuit of rice self-sufficiency maybe a function of its political reality rather than a real economic issue. Given its relatively high birth rate, the relative size of its population, and the limited area for rice production, Philippines is relatively doing very well with a 91.59% self-sufficiency ratio. Therefore, there may be a need to refocus the NRP from self-sufficiency towards competitiveness and resilience.

Table 4. Rice Self-sufficiency Ratio in ASEAN countries.

Country	2009				Global Food Security Index 2015 (Rank)
	Area Harvested (M ha)	Production (MMT)	Domestic Utilization (MMT)	Ratio (%)	
Singapore	none	none	0.175	none	2
Malaysia	0.67	1.59	2.53	63	34
Thailand	11.14	20.89	11.27	185	52
Vietnam	7.44	25.28	18.33	138	65
Philippines	4.53	10.74	13.16	82	72
Indonesia	12.9	40.35	38.43	105	74
Cambodia	2.6	4.59	2.93	157	96
Lao PDR	0.78	1.82	1.76	103	-

The National Rice Program: Key Strategies under Various Administrations

To put the performance review into context, the program components and strategies of the various rice programs under different administrations were examined and compared. Table 5 presents the key goals and strategies of various administrations. In all of these administrations, the rice programs have similar goals and components and differ only in strategies and emphasis.

Table 5. National Rice Program Key Strategies by EO 116/292 MFOs under Various Administrations.

Strategy by MFOs	C. Aquino				Ramos		Estrada	Arroyo	Aquino
	M99	RPEP1	RPEP2	RAP	GPEP/ KPA	GAP	AMP	GMA-CARES	APP/FSSP
1.AF Support Services (Operations)									
a. Research & Development (R&D)	X	X	X	X	X	X	X	X	X
b. Info., Com. & Extension (ICE)	X	X	X	X	X	X	X	X	X
c. Regulations	X	X	X	X	X	X	X	X	X
d. Water & Irrigation Services	X	X	X	X	X	X	X	X	X
2. Public Investment in Human & Physical Infra									
a. R&D (PhilRice)	X	X	X	X	X	X	X	X	X
b. ICE (ATI)									
c. AF Regulatory									
d. Irrigation	X	X	X	X	X	X	X	X	X
e. Farm-to-market road and other rural physical infra	X	X	X	X	X	X	X	X	X
3. Policy Environment									
a. Regulatory & Market Policies	X			X			X	X	X
b. Trade Policies			X	X		X	X		
c. Tech. or Knowledge Mgt. Policies									
d. Partnership Policies								X	X
e. Credit policies	X	X	X	X		X		X	
f. Others									

Strategy by MFOs	C. Aquino				Ramos		Estrada	Arroyo	Aquino
	M99	RPEP1	RPEP2	RAP	GPEP/ KPA	GAP	AMP	GMA-CARES	APP/FSSP
4. Others: Production & Distribution of Private Goods									
a. Seeds Subsidy	X	X	X	X	X	X	X	X	X
b. Fertilizers	X	X	X	X	X	X	X	X	X
c. Pesticides	X	X	X	X	X	X	X	X	X
d. Machineries/Equipment	X	X	X	X	X	X	X	X	X
e. Structure	X	X	X	X	X	X	X	X	X

Legend: **M99** (Masagana 99); **RPEP** (Rice Production Enhancement Program); **RAP** (Rice Action Plan); **GPEP** (Grains Production Enhancement Program); **KPA** (Key Production Area); **GAP** (Gintong Ani Program); **AMP** (Agrikulturang Makamasa Program); **GMA-CARES** (Ginintuang Masaganang Ani-Countrywide for Rural Employment & Services); **APP** (Agrikulturang Pilipino Program); **FSSP** (Food Staples Sufficiency Program)

Source: DA National Rice Program

The entry of the Aquino administration in 1986 puts policy and institutional reforms as instruments to free agriculture markets and enable farmers to enjoy higher farm gate prices. It became the core agenda in agriculture. EO 116 was issued in January 1987. It converted the Ministry of Agriculture and Food into the Department of Agriculture (DA). DA introduced reforms in the rural credit system and established the Comprehensive Agricultural Loan Fund (CALF). In 1988, the Livelihood Enhancement for Agricultural Development (LEAD) program was launched to speed up farmers' organizations access to financing, management expertise, and marketing. Agriculture and fishery councils (AFCs) were set up at the sectoral, regional, provincial, and municipal levels to provide inputs on major programs and policy decisions, and help plan and monitor DA projects. The Rice Action Program (RAP**),** which was introduced in January 1990 enabled the country to export rice in 1992. RAP was heavy on irrigation while its predecessor RPEP focused on the distribution of fertilizer and seeds, irrigation, credit, and price stabilization.

Under President Ramos, DA instituted the Key Production Area (KPA) approach in 1992. It became the basis in the formulation of the Medium-Term Agricultural Development Plan (MTADP). Mid-way in the Ramos term and upon the passage of the GATT by the Philippine Congress, DA launched the *Gintong Ani (Golden Harvest)* in 1996 as a GATT safety net. In support of the *Gintong Ani* program, the Congress approved a lump-sum appropriation, which was placed directly under the Office of the Secretary (OSEC) to finance various programs under the *Gintong Ani* including NRP, which was labeled as *Gintong Ani* Rice.

By putting the *Gintong Ani* directly under the OSEC instead of mainstreaming them in the organic agencies or offices of the DA, the secretary was in effect directly involved in operations. Heads of *Gintong Ani* programs directly reported to the secretary. The big ticket items such as rice, livestock dispersal program, and high-value crops organized their own operational staff albeit ad hoc whose heads directly report to the Secretary. With the banner programs getting the attention of the Secretary as well as the public, it distracted the Secretary's attention from policymaking as well as overseeing DA's organizational effectiveness. It is worthwhile to mention that it was during this time when DA has been the subject of severe public criticisms because

of poor agriculture performance and graft and corruption, which was highlighted by the fertilizer scam that was the subject of the Senate Blue Ribbon Committee investigation.

In December 1997, Congress passed the Agriculture and Fisheries Modernization Act of 1998 or AFMA (Republic Act No. 8435), which had put into action the visions of transforming and modernizing the country's agriculture and fisheries sector. However, even with the passage of AFMA, the funding and organizational arrangements on the NRP and selected National Commodity Banner Programs were retained and continued until 2010. Lump-sum funding under the OSEC was only discontinued by the Department of Budget and Management in 2011 as a consequence of the Supreme Court's ruling declaring the Priority Development Assistance Fund (PDAF) as unconstitutional. NRP has been a recipient of the PDAF funding for a number of years, which in theory augments the NRP budget in the General Appropriations Act (GAA).

The short-lived Estrada administration had the opportunity of starting the implementation of AFMA. *Agrikulturang Makamasa* was its banner program to accelerate agriculture development, a 10-point agenda laid out in July 1998. Essentially, *Makamasa* was *Gintong Ani* in another name. The program goals, structure, program strategies, and implementation schemes were essentially the same.

Upon the assumption of President G. Arroyo to finish the uncompleted term of President Estrada, the *Makamasa* program was relabeled as *Ginintuang Masaganang Ani*−Countrywide Assistance for Rural Employment and Services (GMA-CARES) in 2001 with special emphasis on social equity. Essentially, the over-all program structure and strategies were similar to that of the *Makamasa* program under the Estrada administration. It was during this time when NRP provided greater focus and support to the adoption of hybrid rice by providing incentives in the form of free hybrid seeds, pesticides, and fertilizers to encourage irrigated rice farmers to shift from inbred to hybrid rice.

In 2004, the "vision of a modernized smallholder agriculture and fisheries, a diversified rural economy that is dynamic, technologically advanced, and internationally competitive" was upheld under the elected term of President Arroyo. Two goals were set: 1) to "develop 2M hectares of new lands for agribusiness to contribute two million out of the ten million jobs targeted by 2010", and (2) make food plentiful while keeping the price low.

In 2006, "food security and self-sufficiency" became the focus of the NRP. The FIELDS (fertilizer, irrigation, extension, loans for inputs including shallow tube-wells and surface water pumps, dryers and other postharvest facilities, seed subsidy) program was launched at the 2008 Food Summit.

The rice banner program in 2010 was structured after the Agri-Pinoy framework of development at the start of the Aquino administration. The program is intended to optimize the development of the country's natural and human resources to achieve the goals in agriculture and fisheries, and contribute to the national development. Agri-Pinoy broadened the focus of the rice self-sufficiency program to include other staples, thus, the Food Staples Sufficiency Program (FSSP). It targets rice sufficiency by 2016

through expansion of areas planted to rice including uplands, marshlands, and idle farmlands.

Overall, the strategies of the various rice programs under different administrations have been biased in its resource allocation towards the provision of government support services and subsidies to accelerate the spread of new knowledge and technologies. Subsidies focused on the distribution of material technologies such as fertilizers, pesticides, and certified seeds of high-yielding varieties, farm machineries, and equipment. Subsidies also include the agriculture structures and multi-purpose post-harvest facilities. Support services include credit, research and extension, information and communication, and price stabilization.

Proponents of agricultural subsidies have argued that such programs "stabilize commodity markets, aid low-income farmers, raise unduly low returns of farm investments, aid rural development, compensate for monopoly in farm input supply and farm marketing industries, help ensure national food security, offset farm subsidies provided by other countries, and provide various services". However, these arguments have not been substantiated (Sumner 2016).

Among the common concerns on farm subsidies are: a) their income transfers from consumers and taxpayers to all farm owners and operators who are not necessarily poor; b) they impose net losses on society (or deadweight losses) and have no clear broad social benefit; and (c) they impede movements towards more open international trade and impose net costs on the global economy (Sumner 2016).

However, abstracting from above, meeting production and yield targets is not just a function of government interventions but of other factors as well. For instance, decisions by farmers, their farm endowments and nature also play significant roles. This complexity is reflected in the relatively low annual rates of growth in yields of just 1.4% for irrigated rice and 1.2% for rainfed rice despite the seemingly comprehensive and high cost of government interventions.

Rice Extension Support, Education, and Training Services (ESETS): Strategies

The strategies for rice ESETS include the following: 1) training of rice extension technicians, farmer-leaders and farmers through Farmers' Field School and School on the Air; 2) demonstrations of rice technologies (e.g. varietal trials, fertilizer trials, IPM, etc.); 3) rice information system; 4) use of rice technology packages to standardize training and use of rice technology (e.g. IPM, *PalayCheck*, Integrated Nutrient Management, etc.); 5) ESETS innovations such as IPAD, PRISM, RCM, Next-Gen, Associated Tech., *Palayamanan*, AgriDoc, etc. and; 6) material technology subsidy to accelerate wider applications (e.g. seeds, fertilizers, pesticides, and machineries. Table 6 compares the efficiency estimates of selected Asian nations in 1980-2010.

Table 6. Efficiency, Technical, and Malmquist Productivity (TFP) Indices in Paddy Production, 1980-2010.

Year	Items	Malaysia	Myanmar	Philippines	Thailand	Vietnam	Mean
1980-1985	Eff	1	1	1.032	1.011	1.025	1.014
	Tech	0.976	0.968	1.01	0.995	1.003	0.99
	Tfp	0.976	0.968	1.042	1.005	1.029	1.004
	Eff	1	1	1	1.004	1.019	1.005
1986-1990	Tech	0.998	1.049	0.967	0.954	1.003	0.994
	Tfp	0.998	1.049	0.967	0.957	1.023	0.998
	Eff	1	1	1	1	1	1
1991-1995	Tech	1.018	0.96	0.996	1	1.029	1
	Tfp	1.018	0.96	0.996	1	1.029	1
	Eff	1	1	1	1	1	1
1996-2000	Tech	0.976	1.065	1.001	1.023	1.026	1.018
	Tfp	0.976	1.065	1.001	1.023	1.026	1.018
	Eff	1	1	1	0.99	1	0.998
2001-2005	Tech	1.007	1.618	1.021	1.024	1.036	1.12
	Tfp	1.007	1.618	1.021	1.014	1.036	1.118
	Eff	1	1	1	1.01	1	1.002
2006-2010	Tech	1.045	1.048	1.026	1.032	1.033	1.037
	Tfp	1.045	1.048	1.026	1.042	1.033	1.039

Note: The Eff, Tech, & TFP in 1980-1985 were much higher compared with CRS Technology by country.

Productivity is the ability of the production factors to produce optimal output. Productivity studies has taken the attention of most economists and policymakers in recent years because they believed that no meaningful economic development and welfare improvement can take place in the absence of productivity growth. According to Fare et al (1994), the two key factors to productivity growth are technological advancement also known as technical change (shift in production frontier) and technical efficiency change (movement towards or away from the frontier). Various views of productivity are expressed in accounting, economics, engineering, industrial, and management. Different fields have different perspectives on the definition of productivity. An economist views productivity as a ratio of output to input resources used in the production process. On the other hand, a company management defines productivity as gross value added less depreciation of the inputs used in process of production. For a consumer, productivity means bringing quality products and services at an affordable prices and higher standard of living.

Following the economists' perspective, productivity can be classified as partial factor productivity and total factor productivity. The partial factor productivity only addresses real output to single input used in production process while total factor productivity index takes into consideration the ratio of output and all inputs in the process of production. Owing to limitations posed by partial factor productivity measurement, many researchers now concentrate on total factor productivity for more reliable and comprehensive measurement.

Numerous empirical works have been done on the production and economic efficiency of rice farm both within Asia and Africa. Both efficiency measures (input-oriented and output-oriented) have been applied in the two continents. Input-oriented approach measures productivity differences as differences in minimum input requirements conditional on a given amount of output while output-oriented approach defines productivity differences as differences in maximum output conditional on a given amount of inputs used (Capalbo, et al, 1990). According to Färe, et al, (1990), the two approaches are equivalent under constant returns to scale, but they differ under variable returns to scale.

Notwithstanding, some studies (Coelli and Rao, 2005; Trueblood and Coggins, 2003) have been done in the recent years to examine differences in productivity across countries. According to Coelli and Rao, (2005) the factor productivity in agriculture between developed countries and developing countries is converging. This means that there is a high chance to increase production through productivity growth in the developing countries. In a similar development, Sharma, et al, (1990) indicated in their seminal paper that there is evidence to show that the level of productivity in developing countries is still low compared with developed countries. Hence, this indicates a possibility to increase the productivity in developing Asian countries.

Umetsu et al (2003) conducted an analysis on regional total factor productivity as well as efficiency change and technological chance in the Philippine rice sector. The findings show that the average annual Malmquist productivity indices were slightly positive from 1971 to 1990. The results assert that the growth was low during early 1970s which was followed by slight positive growth owing to technological change in rice farming.

Decomposition of Total Factor Productivity Growth

The growth in total factor productivity (TFP) is defined as a growth in outputs , which is unexplained by the growth in the use of inputs in production or the sum of technical efficiency change (EC) and technical change (Pfeiffer, 2003).

Generally, there are two methods that are extensively used to measure TFP growth (parametric and non-parametric approaches). These measurements, as well as its decomposition, help us track useful information about the sources of TFP growth. The information gained from such study will undoubtedly become useful for both the producers and policymakers in making better policies to determine growth in any given sector. One of the widely used techniques in measuring productivity growth is the computation of Malmquist productivity index introduced by Caves, et al (1982) based on distance functions. Following Färe, et al (1994), this index can be calculated using a nonparametric technique, an approach that allows productivity growth to be decomposed into two components namely efficiency change capturing the performance relative to the best practice in the sample (also interpreted as the “catching up effect”), and the technical change measuring the shift in the frontier over time. According to Färe, et al (2001), the improvements in technical change component can be interpreted as evidence of innovation for the country under consideration. He further stated that additional examination of which can help identify the innovators.

What are we missing in rice ESETS?

Basically, the limitations of Rice ESETS (1986-2016) are the following: 1) lack of a system-wide quality planning framework to address the NRP ESETS (extension) effectiveness (Figure 8); 2) lack of system-wide strategic plan (Figure 9); and 3) lack of strategic framework in regard to National Systems of Agriculture Innovation and Rice-Based Innovation System (Figure 10).

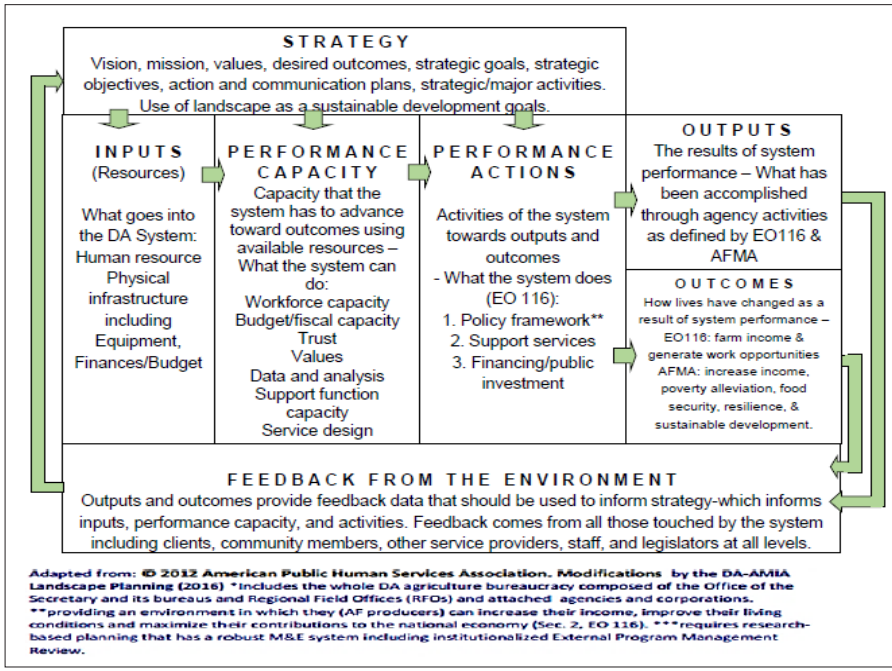


Figure 8. The DA Extension System Organizational Effectiveness Framework

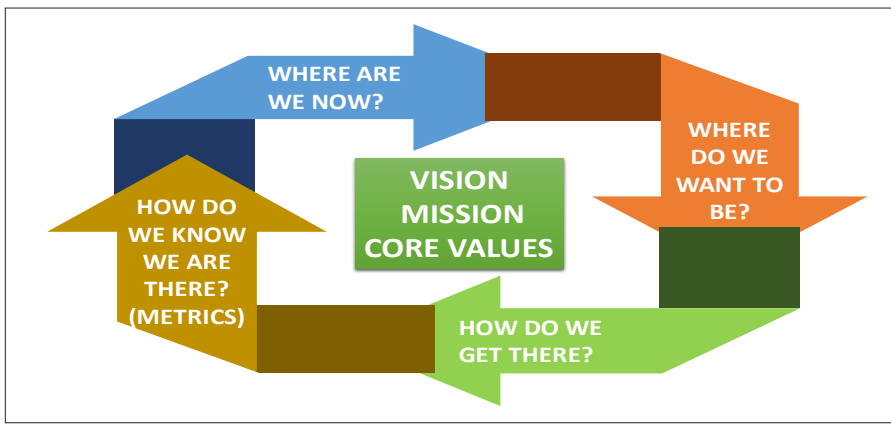


Figure 9. ESETS Systems-Wide Strategic Plan

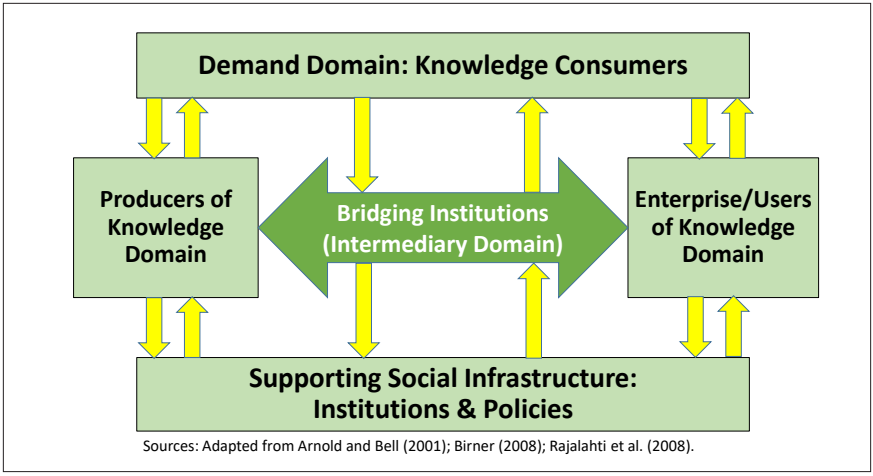


Figure 10. National System of Agriculture Innovation

NIS is defined as a set of functional institutions, organizations, and policies that interacts constructively in pursuit of a common set of social and economic goals and objectives, and uses the introduction of innovation as the key promoter of change (World Bank, 2008). At its simplest, this concept states that innovation emerges from evolving systems of actors, their interaction and processes that are involved in research, and the application of research findings for socioeconomic benefits. The NIS concept will allow better understanding of the governance, resource allocation, and outcomes in short, medium, and long term. NIS is a generic concept, which has three components: knowledge domain, business domain, and environment as shown in Figure 10.

The concept of NIS was first mentioned in the industrial innovation literature in the late 1980s. The study of NIS started with relatively simple descriptive analysis that tried to explain the difference in innovative activity and performance between countries. More recently, however, the theoretical underpinning of NIS approach has been substantially improved by the addition of insights from various streams of thinking, including evolutionary economics, theories of learning, institutional thesis, and systems theory (Roseboom 2004). NIS is simply an analytical tool that can be used for planning and policymaking to enhance innovations. NIS permits actors and stakeholders within the system to identify their distinctive roles and understand their relationships to others in the system. The net result is the potential for better articulation, identification of gaps and challenges, and greater agreement, at least in principle, on the future requirements for the system (Paterson et al. 2003).

The important characteristics of NIS and the lessons learned (Metcalfe 1995; Arnold and Bell 2001; Roseboom 2004; Hall et al. 2005) are the following:

- NIS put emphasis on the interdependence and non-linearity in the innovation process, and in-demand as a determinant of innovation. They are strongly influenced by evolutionary thinking. A unique optimal NIS does not exist, and dynamic NIS are continuously adapting and transforming themselves as new opportunities arise.
- NIS put great emphasis on role of the institutions both in terms of the rules of the game and the players (organizations). The success of innovation relies heavily on the 'framework conditions'—policies, laws, rules and other cultural aspects—and the basic infrastructure of the system. Indeed, a particular culture's way of working, the social values it places on innovation and entrepreneurship, funding priorities, and the notion of risk often most effectively explain the difference between those who innovate and those who do not.
- Greater emphasis is placed on the pattern and intensity of interactions between the different actors within the NIS.
- Successful innovation requires both the 'supply-push' of the research community and the 'demand-pull' of the users of new knowledge. Indeed, a successful system of innovation requires a constant interaction between many organizations and individuals in both camps.
- Innovation takes place within a social system of which research and researchers form only a part of. Other essential components are the networks of actors that provide communication channels linking organizations and individuals. Such networks can be both formal and informal. 'Intermediate organizations' often prove crucial to successful innovation, particularly when their task is to find out what producers (and their end users) want, and to search through the options within the stock of existing and new knowledge to find what best meets the needs.

Rice-based innovation systems as shown in Figure 11, incorporate various players, their actions and interactions, as well as the enabling environment, facilitating institutions, and services that promote various forms of innovation along the value chain of the commodity. This emphasizes the notion that innovation can occur anywhere along the value chain and not necessarily at the farm level. Thus, broadening the research agenda to incorporate both bio-physical and socio-economic research within the rice sector.

ESET's critical issue are effectiveness and efficiency.

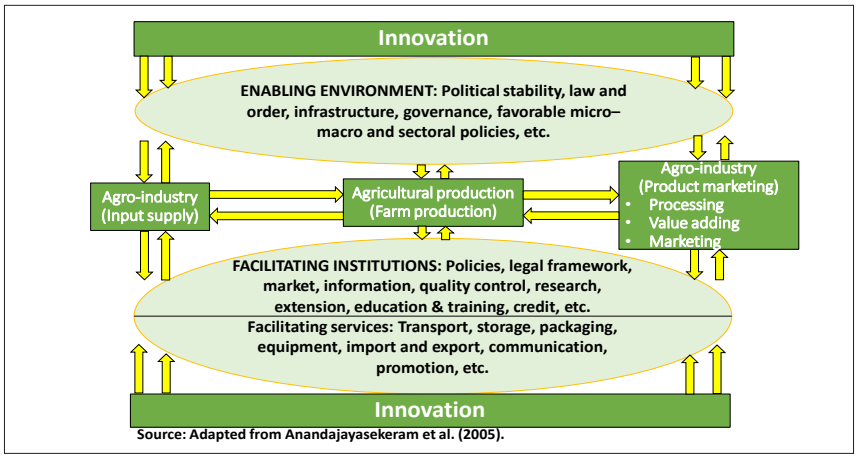
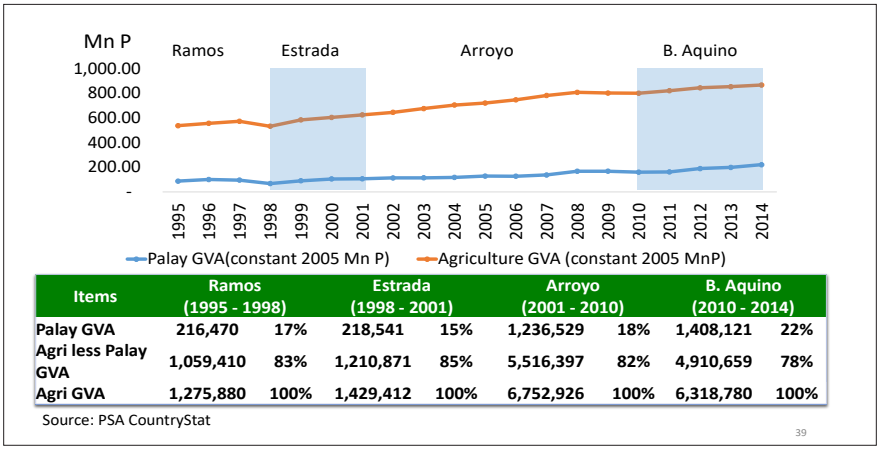


Figure 11. Rice-Based Innovation System

Financing The Rice Sector: How Much Is Extension?

An increasing trend can be seen in the agriculture and *palay* gross value added (GVA) (Figure 12). On the other hand, rates of growth are relatively low given the flatter lines. Across various administrations, the shares of *palay* to total agriculture have been rising from 15% during the Estrada administration to 22% in nominal terms.



Items	Ramos (1995 - 1998)		Estrada (1998 - 2001)		Arroyo (2001 - 2010)		B. Aquino (2010 - 2014)	
Palay GVA	216,470	17%	218,541	15%	1,236,529	18%	1,408,121	22%
Agri less Palay GVA	1,059,410	83%	1,210,871	85%	5,516,397	82%	4,910,659	78%
Agri GVA	1,275,880	100%	1,429,412	100%	6,752,926	100%	6,318,780	100%

Source: PSA CountryStat

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Figure 12. Trends in Real Agriculture & *Palay* GVA (2005 Prices), 1995-2014.

The allocation for the agriculture sector through DA and its attached agencies has been generally rising and had increased dramatically in the last two years of the Arroyo administration as a reaction to the rice crisis (Figure 13). In the succeeding administration, the allocation increased even further apparently as a response to the calamities battering the agriculture sector and the stronger resolve to attain rice self-sufficiency.

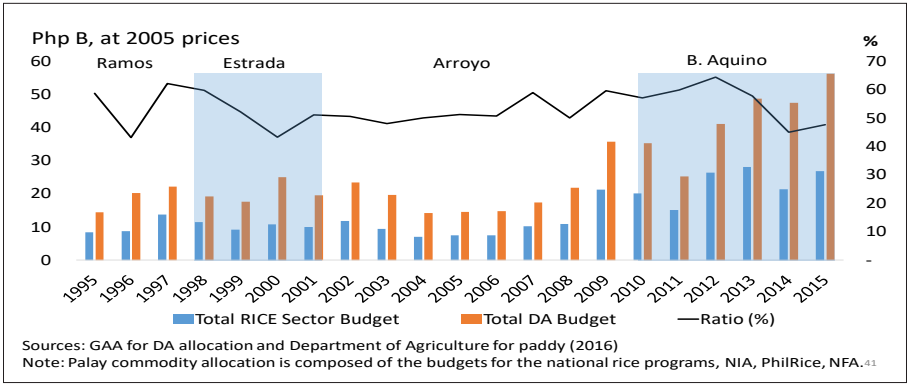


Figure 13. Total Rice Sector Budget & Ratio of Rice Commodity Budget to Total DA Budget, 1995-2015.

The figures must grossly underestimate the total resources that go to rice. Earlier estimates of Dy (2005) and David and Inocencio (2000) show that rice accounted between 75-80% of total agriculture allocation. Nonetheless, in these rough estimates the allocations exceeded 50% of the total allocations for DA including the attached corporations for almost all years. Table 7 gives the annual average budgets by administration. Except for the Estrada administration, all three other administrations had 54-56% allocation for rice commodity. While in relative terms, the importance of rice in the budget has not changed much, yet the magnitude has been increasing drastically. In the latter part of the Ramos administration and the middle part of B. Aquino's, sharp increases were observed followed by sharp declines. During Ramos time, the sharp increase in the relative allocation for rice was likely a response to El Niño. In succeeding administrations, the rise in allocation must have been a response to the rice crisis in 2008 and the deluge of major calamities, which largely affected the agriculture outputs. The rice sector budget from 1995 to 2015 accounts on the average 52.32% of the total DA budget.

Table 7. Rice Sector Budget Compared to Palay GVA Growth Rates, 1995-1998 to 2011-2015.

Items	Ramos (1995-1998)		Estrada (1999-2000)		Arroyo (2001-2010)		B. Aquino (2011-2015)	
	Amount	%	Amount	%	Amount	%	Amount	%
Total Rice Sector Budget	33,158	56%	16,794	47%	129,534	54%	182,177	54%
(Annual Ave.)	-8,290		-8,397		-12,953		-36,435	
Total Agri less Rice Sector Budget	26,243	44%	18,953	53%	109,794	46%	157,659	46%
(Annual Ave.)	-6,561		-9,481		-10,979		-31,532	
Total Agriculture Budget	59,401	100%	35,757	100%	239,328	100%	339,836	100%
(Annual Ave.)	-14,850		-17,878		-23,933		-67,967	

Source: GAA various years; Department of Agriculture (2016).

Using Ramos as the baseline figure to make comparison in terms of government cost to achieve growth in rice production and Gross Value Added (GVA), it has become more expensive for the government to attain growth. To attain 1% growth in annual

production, the cost in the Arroyo administration is P3.773 billion (7.62 times that of Ramos) while in the B. Aquino administration is P6.061 billion (12.24 times that of Ramos). On the other hand, to attain 1% *palay* GVA growth rate, the cost in the Arroyo administration is P1.894 billion (2.44 times that of Ramos) while in the B. Aquino administration is P4.348 billion (5.61 times that of Ramos) (Table 8).

Table 8. Rice Sector Budget Compared with *Palay* GVA Growth Rates, 1995-98 to 2011-15.

Items	Ramos (1995-1998)	Estrada (1999-2000)	Arroyo (2001-2010)	B. Aquino (2011-2015)
Total Rice Sector Budget (Php M)	33,158	16,794	129,534	182,177
Annual Average Rice Budget (Php M)	8,290	8,397	12,953	36,435
Annual Average *Palay* GVA Growth Rate (%)	-6.08%	7.88%	4.17%	3.30%
Annual Ave. Rice Budget per 1% growth in *Palay* GVA (Php M)	-1,363	1,065	3,108	11,054

Sources: GAA & PSA CountryStat

Note: Rice sector budget includes National Rice Program, NIA Capital Outlay, NIA Support and PhilRice

National Rice Program Budget

Table 9 shows the NRP budget by operating units from 2011 to 2016. In terms of operating units, RFOs accounted for over three-fourths of the total budget while the OSEC got 9%. The distribution indicates that the RFOs were directly responsible for the bulk of DA's budge, which was reflective of a decentralized system. If the allocation for RFOs is divided among the 17 regions, the regional average allocation would just be 4.6%. Among the bureaus, the combined allocations to BAR and BSWM, which would be close to the allocation in direct control of the OSEC was indicative of an increasing importance given to research.

Table 9. National Rice Program (NRP) Budget by Operating Units, 2011-2016 (Php M)

Components	Prod. Support	Irrigation Dev't. Services	Infra & Post-harvest Dev't. Services	Market Dev't. Services	ESETS	R&D Services	Reg. Services	Plans, Policy, Prog. Coord., M&E	TOTAL	%
RFOs	10,396	4,839	8,556	84	3,921	2,043	70	864	30,772	79
ATI	27				467	10		79	583	1
BAR					24	1,141		20	1,185	3
BAS						10		143	153	>1
BSWM	196	1,217			28	23		72	1,536	4
BPI	122				31	31	182	41	407	1
PhilMech			535		15			15	565	1
PhilRice						322			322	1
OSEC	1,098	32	162	20	1,271	20		848	3,451	9
TOTAL	11,838	6,088	9,253	104	5,757	3,600	252	2,082	38,974	100
%	30	16	24	>1	15	9	1	5	100	

Source: DA National Rice Program

Before PDAF scandal, NRP was a lump-sum budget under the OSEC, which was then sub-allocated to various operating units based on their approved proposals. This practice has been criticized by COA as prone to leakages and political interference (COA Special Audits Office Report No. 2012-03). Since 2014, as a result of public outcry on PDAF, the NRP in the General Appropriations Act (GAA) reflected its allocation to various operating units. The Bureau of Agricultural Research (BAR) manages the R4D budget while the Agricultural Training Institute (ATI) manages the extension budget. These lead agencies sub-allocate their respective budgets for R4D or extensions to partner institutions within or outside the DA based on approved proposals.

Figure 14 gives NRP budget by agency and major final output (MFO) for the RFOs and OSEC from 2011 to 2016. The distribution of budget by the RFOs differs from that of the OSEC. The RFO allocation by MFOs show that production support accounts for about a third of the total. This item is followed by infrastructure and post-harvest, and irrigation, which comprise close to half of the total budget.

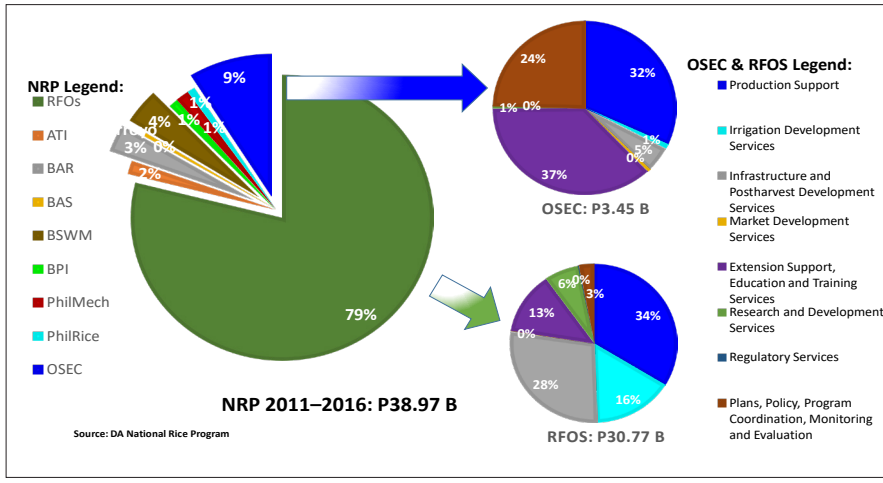


Figure 14. National Rice Program (NRP) Budget by Agency & Budget Breakdown of RFOS & OSEC, 2011-2016

The OSEC, on the other hand, despite the DBM ruling of allocating the budgets to the operating units, continues to have a substantial allocation of P3.45 billion over a period of six years or an average of P0.58 billion annually. The distribution of the OSEC budget indicates that both the ESETS and production support are priorities. One good feature of the OSEC budget distribution is the substantial share for plans, policy, program coordination, and monitoring and evaluation (M&E), which are the core functions of the Office.

For the entire NRP for 2011-2016, the infrastructure and irrigation MFOs got 44% of total while production support got about 30%. ESETS have been allocated with about 16% while R4D had close to 5%. Thus, the NRP of the last administration was mostly about infrastructure and production support.

The diagram shows NRP budget by agency and budget breakdown of RFOs (79%) and OSEC (9%), the operating units with the largest share of the NRP budget from 2011 to 2016. Allocation by MFOs shows that the RFO budget (P30.77 billion) are mainly allocated for production support and infrastructure and post-harvest development services, which accounts for 62%. Irrigation development services (16%) and ESETS (13%) follow in terms of percentage. Other MFOs are less than 10% each.

The OSEC receives an allocation of P3.45 billion over a period of six years or an average of P0.575 billion annually. Allocation by MFOs shows that ESETS got the highest percentage at 37%, followed by production support (32%), and plans, policy, program coordination, and M&E (24%). Other MFOs have less than 10% each.

The diagram shows that budget for both R4D and ESETS have not been channeled to their respective lead agencies: BAR for R4D and ATI for ESETS.

Annual Allocation of the NRP Budget in the Last Two Administrations, 2005-2016

The budget in the last administration appears to be more spread across key intervention areas compared to the relatively skewed distribution of the Arroyo budget (Figure 15). The big increase in the irrigation services allocation in the Aquino administration is notable. While the transfer of NIA to the Office of the President may have some influence, it looks like the government's food staples sufficiency program must have prompted the DA to take matters into its own hands and do more irrigation projects outside NIA. This argument is supported by the doubling of allocation in the Aquino administration.

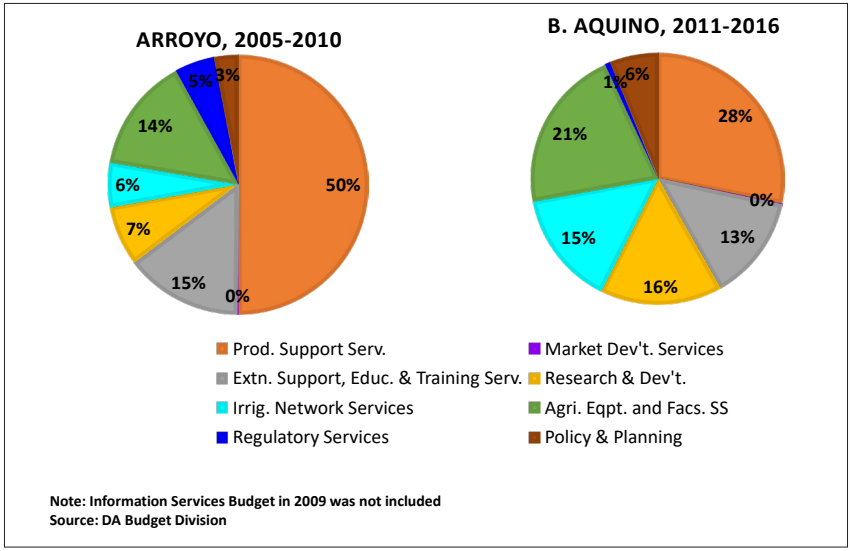


Figure 15. Distribution of NRP Budgets According to AFMA Components/ Major Final Outputs (MFOs), 2005-2016

Comparing the Arroyo administration (2005-2010) and B. Aquino administration (2011-2016), the production support services and agriculture equipment and facilities made up 64% of the budget under Arroyo administration and 49% under B. Aquino administration. ESETS for both administrations receive almost the same percentage allocation. On the other hand, R4D and irrigation network services receive greater allocation of resources as much as two times more in the B. Aquino compared with the Arroyo administration. The two administrations show similar bias in the allocation of resources by MFOs. The production and distribution of the private goods in the form of seeds, fertilizers, pesticides, machineries, and equipment received the highest priority in both administrations.

Figure 16 shows high variability from year to year, which indicates budget instability. The greatest variability occurs on the budget allocation for production support services and agriculture equipment and facilities. These are mostly private goods procured by the DA and distributed to recipients with or without counterpart resources. The DA treats these MFOs (PSS, Agriculture Equipment Support Services) as forms of subsidies to accelerate the use of new technologies to increase yields and total harvest. Concerns have been raised if subsidies in the form of material technologies that are limited to few recipients are most appropriate considering their limited effects to the sector. Such an approach is susceptible to rent-seeking behavior and will mainly benefit the better-off farmers or cooperatives. There are other methods of accelerating the use of technologies such as subsidized credit that are more equitable to target recipients and less prone to rent-seeking behavior and political patronage.

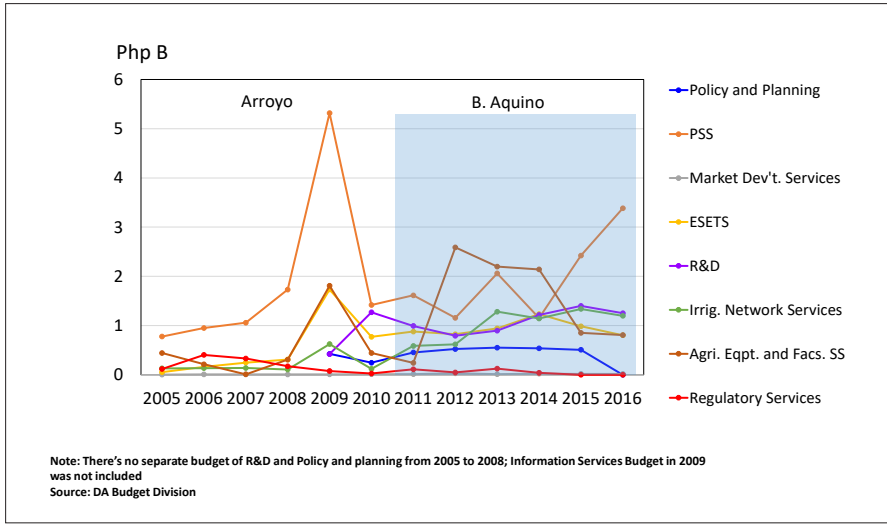


Figure 16. Trends in National Rice Program Budgets by AFMA Component/ Major Final Output

Deconstructing the National Rice Program Budget by EOs 116/292 Major Final Outputs (MFOs)

From 2009 to 2013, the DA listed three MFOs in compliance to the DBM budget circular. The list of MFOs shows that the categories do not exactly cohere to the mandates of the DA as spelled out in EO 116/292. It is noted that the DA MFOs have overlapping categories, which make it difficult to account investment or allocation by policy instruments. It is noticed that the rice program has an MFO entitled "Production and Distribution of Private Goods", which is not provided for in EO 116/292. The EO identified the three MFOs that the DA should focus government interventions to in order to achieve the goals of agriculture development. These are as follows: 1) AF Support Services, 2) Investment in AF Public Infrastructure, and 3) Improvement in the Policy Environment to make agriculture efficient in the attainment of the goals of modernization. Sub-MFOs are listed based on the literature especially from the FAO. To fully account for allocation of resources by key policy instruments, the budgets of the DA NRP from 2005 to 2016 are being deconstructed according to the EO 116/292 MFOs. Deconstruction of the NRP budget was limited on those years where data were available.

In deconstructing the DA MFO budget in terms of EO 116/292 MFOs, there are categories in the DA MFOs that are not found in the latter MFOs. These are shaded in Table 10.

Table 10. EO 16/292 MFO Budget Cost & Objectives

Major Final Output Budget			Objectives
1. AF Support Services (Operations) a. R&D b. ICE c. Regulations	d. Water and Irrigation Services e. Others		Cost of Operations
2. Public Investment in Human and Physical Infra a. R&D b. ICE c. AF Regulatory	d. Irrigation e. Farm to market and other rural physical infrastructure		Cost of improving the human and physical infrastructure towards greater resilience and effectiveness
2. Policy Environment a. Regulatory & Market Policies b. Trade Policies c. Tech./Knowledge Management Policies	d. Partnership Policies e. Credit Policies f. Financing Policies g. Others		Cost of reducing or removing structural or organizational barriers of efficiency and effectiveness

The 2009-2015 NRP budget is deconstructed according to the development framework of EO 116/292 to better account for investment in terms of the key policy instruments of agriculture development specified by law. This is to address the issue of overlapping categories in the MFOs used by the DA during the period covered.

From 2009 to 2015, the DA has a budget of P50.64 billion for the NRP (Table 11). Deconstructing the budget according to the MFOs of EO 116/292 shows that

the greatest allocation is on the production and distribution of private goods, which amounts to P20.78 B or 41% of the total. The provision of support services comes second at 36% or P18.23 B. This is followed by investment in public infrastructure at P8.41 billion or 17%. Investment on improving the policy environment gets a miniscule P0.11 billion or less than one percent. Program management and M&E has a budget of P3.10 billion or 6% of the total.

Table 11. Deconstructed NRP Budget (Php B) Breakdown by EO 116/292 MFOs, 2009-2015

MFOs by EO 116/292	Plans, Policy, Prog. Coord., M&E	Prod. Support	Market Dev't. Services	ESETS	R&D Services	Irrig. Dev't Services	Other Infra/ Post-harvest & Farm Equipt.	Regular Services	Others	TOTAL	%
AF Support Services	0.11	2.63	0.24	7.76	6.28	0.31	0.02	0.39	0.49	18.23	36
Investment in AF Public Infra	0.01	0.28			0.16	5.32	2.64			8.41	17
Policy Environment	0.1								0.01	0.11	>1
Program Management, M&E	3.1									3.1	6
Others: Prod. & Dist. of Private Goods		12.44		>1			8.34			20.78	41
TOTAL	3.32	15.36	0.24	7.76	6.44	5.63	11	0.39	0.5	50.64	100
%	7	30	>1	15	13	11	22	1	1	100	

Note: Others – Expanded Modified Rapid Composting Program (2010); R&D includes PhilRice Budgetary Support & Income
Source: DA National Rice Program

The production and distribution of private goods that takes up 41% of the total NRP budget is a doubtful investment in view of its character. The beneficiaries are limited and it is an inefficient means to accelerate technology adoption. In addition, it's prone to rent-seeking behavior. Several COA reports mentioned undistributed machineries and equipment, unverified beneficiaries, rotten seeds, and destroyed fertilizers in the DA warehouses. Recently, the new DA Secretary berated the regional executive director of Region 12 because of undistributed and decaying agricultural equipment and machineries. They remain undistributed due to the failure of the recipients to come out with counterpart funds or the recipients do not have interest because the machines do not meet their needs.

Climate Change, Rice Farming, Rural Poverty & Rice Extension

The Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA) drought/dry assessment (2016) indicated that about 11% of the country or 8 provinces were to experience drought while 21 provinces were predicted to have dry spells. The recent El Niño was expected to affect paddy production in the country. Delos Reyes and David (2009) estimated the damage from El Niño to be as high as 22% of total rice production. While the 2015-2016 episode was expected to be weaker than the El Niño in 1997, which was known as the worst

occurrence in the 20th century (Reyes, Domingo, Mina, & Gonzales, 2009), it resulted in unrest in North Cotabato with farmers' protest ending in some deaths and injuries (Manlupig, Lacorte, Magbanua 2016).

As a response to El Niño, the DA prepared for the expected drought with intensified cloud-seeding operations, distribution of drought-tolerant crop varieties, water-saving technologies, and improvement of irrigation systems. The local government units identified by PAGASA in 2016 as "highly vulnerable" to El Niño included Ilocos region (Ilocos Sur, Ilocos Norte, La Union, Pangasinan); Cagayan Valley (Cagayan); Central Luzon (Aurora, Bataan, Bulacan, Nueva Ecija, Pampanga, Tarlac, Zambales); Calabarzon (Cavite, Rizal); Mimaropa (Occidental Mindoro, Palawan); Western Visayas (Capiz, Iloilo, Negros Occidental); Zamboanga Peninsula (Zamboanga City); Northern Mindanao (Misamis Oriental); and SOCCSKSARGEN (Sarangani, South Cotabato).

DA estimated that more than 300,000 ha of agricultural lands had been affected by drought or equivalent to P5.3 billion worth of rice yield losses (Department of Agriculture 2016). While the recent El Niño damages turned out less devastating than expected, the substantial effects of climate change will be more felt in the long run rather than the short run. There is a need for a better understanding of the potential and mechanisms of impact, and to study long-term effects and implications on the use and availability of resources for rice production.

Increasing and More Damaging Effects of Natural Calamities

Table 12 shows a list of Philippine cyclones with casualties and agricultural damages from 1998 to 2015. Cyclones, as defined by PAG-ASA, include typhoons and storms. On the average, there are about 7 cyclones a year that result in casualties and agricultural damage. On the average, 13 regions with some regions having multiple occurrences, were affected. Under B. Aquino, annual average typhoon damage was P22.6 billion.

Table 12. Philippine Cyclones* with Casualties and Agriculture Damages, 1998-2015

Year	President	No. of Cyclones	No. of Regions Affected	No. of Regions Affected (multiple response)	Casualties	Agriculture Damage (Php B)
1998		5	11	26	490	4.903
1999	Estrada	8	7	21	118	1.061
2000		9	13	37	345	2.12
2001		4	14	31	432	3.562
2002		7	13	22	169	0.34
2003		9	12	34	139	1.315
2004		9	11	55	2396	9.466
2005	Arroyo	3	12	17	48	0.11
2006		7	12	44	1134	8.998
2007		4	10	23	57	1.18
2008		9	14	42	673	12.642
2009		11	16	73	1111	28.857

Year	President	No. of Cyclones	No. of Regions Affected	No. of Regions Affected (multiple response)	Casualties	Agriculture Damage (Php B)
2010	Aquino	2	6	9	110	8.557
2011		10	17	61	1538	16.818
2012		8	16	36	1174	26.888
2013		9	16	56	6378	26.95
2014		8	15	53	292	40.317
2015		7	10	31	139	16.372
Total		129	225	671	16,743	210.457
Annual Average		7	13	37	930	12

Increasing Affected Agriculture Area

According to statistics, climate change events have increasingly affected agricultural areas. Figure 17 shows the total agricultural area affected. From 2000 to 2015, while the affected areas varied from year to year, the time trend shows that over the last 15 years the affected areas have almost doubled, increasing at an average of 36,000 ha per year.

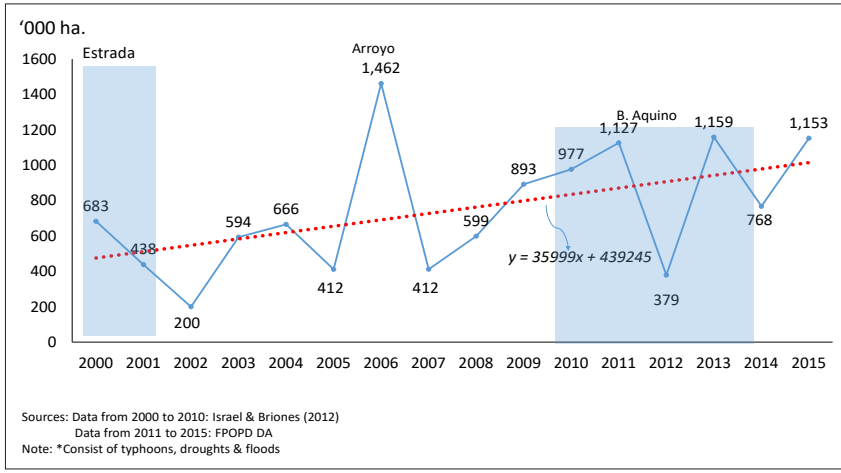


Figure 17. Total Agriculture Area Affected by Natural Calamities*, 2000-2015

About 85% of Strategic Agriculture and Fisheries Development Zones (SAFDZ) areas are vulnerable to climate change events such as drought, flooding and landslide. SAFDZ are zones identified based on the network of protected areas for agricultural and agro-industrial development or NPAAAD. What makes SAFDZ vital is the principle of using efficiency in assigning agricultural areas for food production and security. Table 13 shows the impact of climate change to agriculture. It appears that of the total area covered by SAFDZ, only about 14% is not affected. This means that the remaining area covering 86% of SAFDZ of the country is affected by any or combination of the following: drought, flooding and landslide.

Table 13. Estimated Impacts of Climate Change to Agriculture

Code	Climate Change Impact	Hectares	Percent of Country
1	Drought + Flooding + Landslide + SAFDZ	162,099	0.54
2	Drought + Landslide + SAFDZ	397,715	1.33
3	Flooding + Landslide + SAFDZ	151,605	0.51
4	Drought + Flooding + SAFDZ	2,597,894	8.66
5	Drought + SAFDZ	3,358,361	11.19
6	Flooding + SAFDZ	2,720,265	9.07
7	Landslide + SAFDZ	729,551	2.43
8	Drought + Flooding + Landslide	101,733	0.34
9	Drought + Landslide	703,825	2.35
10	Flooding + Landslide	155,947	0.52
11	Drought + Flooding	1,129,298	3.76
12	Dry Land Only	4,549,601	15.17
13	Flooding Only	1,560,165	5.2
14	Landslide Only	1,723,463	5.74
15	SAFDZ only (not affected)	4,248,134	14.16
	Total	24,289,655	80.97

Note: GIS analysis, E.C. Godilano, 2009, 2010
Source: Rudinas et. al (2013)

Rice is Worst Hit Among Agricultural Commodities

Of all agricultural commodities, rice bore the brunt of the damage brought about by climate change events. In the last 16 years, climate change damage to crops accounted for the largest share while damage to fisheries and livestock was relatively minimal. From 2000 to 2015, the total damage to agriculture commodities reached P260 billion (Table 14). In terms of value, the rice annual damage is about P6.6 billion while annual average damage to all other crops is P8.3 billion. The largest total and annual average damage to a single commodity is that for rice.

Table 14. Total Value of Damage to Agriculture Commodities due to Natural Calamities*, 2000-2015 (Php M).

Year	Rice	Other Crops	Fisheries	Livestock	Total
2000	1,595	683	358	8	2,644
2001	805	1,045	255	95	2,200
2002	548	458	127	16	1,150
2003	1,320	2,246	242	49	3,857
2004	1,698	3,928	1,906	44	7,576
2005	1,942	2,498	6	0	4,447
2006	3,401	6,307	1,081	223	11,012
2007	1,882	3,337	89	3	5,311
2008	5,015	5,270	3,152	246	13,683
2009	23,842	3,991	1,597	88	29,519
2010	15,559	9,594	303	28	25,484
2011	17,842	3,937	859	165	22,804
2012	3,878	27,079	723	368	32,047
2013	7,139	24,197	1,552	828	33,716
2014	6,499	27,676	5,476	155	39,806

Year	Rice	Other Crops	Fisheries	Livestock	Total
2015	13,367	10,046	868	300	24,581
Total	106,333	132,293	18,595	2,616	259,837
Average	6,646	8,268	1,162	164	16,240

Sources:
Data from 2000 to 2010: Israel & Briones (2012)
Data from 2011 to 2015: FPOPD DA
Note: *Consist of typhoons, droughts & floods

Based on the Annual Average Distribution of Damage to Agriculture Commodities due to Climate Change Events from 2000-2015, rice took up 41% followed by coconut (17%), corn (14%), and banana and HVC (9%). The relative damage to fisheries is much lower compared to the crop sector while livestock has a damage of only 1% on the average (Figure 18). There is a need to take into account the increasing damage to rice and the need to improve resilience of rice production.

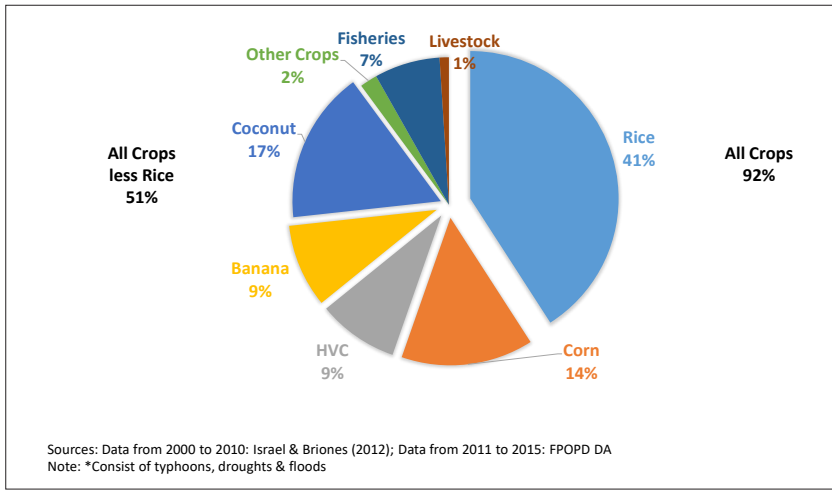


Figure 18. Annual Average Distribution of Damage to Agriculture Commodities due to Natural Calamities*, 2000-2015

Overtime, typhoon has been the major source of production loss for the rice industry as seen on Figure 19. Likewise, an increasing trend is observable.

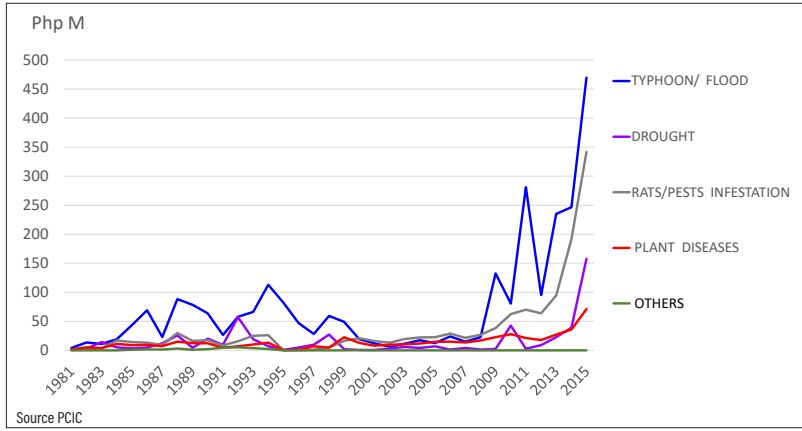


Figure 19. Production Loss Claims for Rice due to Natural Calamities* and Others, 1981-2015

Looking at the annual average rice area damaged, the last five years (2011-2015) was 1.45 times higher compared with the area damaged between 1995 and 2004 (Table 15). As a consequence, the corresponding volume of *palay* and the equivalent value in peso have proportionately increased over the same period. A recent study warns of increasing intensity as confirmed by the stronger and bigger typhoons, which the country has had in the last several years (Mei, Xie, Primeau, Williams & Pasquero 2015).

Table 15. Annual Damages to Rice Production from Natural Calamities*, 1995-2004 and 2011-2015

YEAR	Area(ha)	Volume(MT)	Value (P'000)
1995	581,511	953,436	3,977,341
1996	95,326	114,979	234,706
1997	201,021	204,186	433,284
1998	1,281,838	1,863,848	4,679,394
1999	278,956	258,487	809,088
2000	375,029	510,553	1,594,869
2001	214,593	296,040	805,059
2002	121,199	220,760	548,347
2003	287,199	413,155	1,320,091
2004	362,086	649,531	1,696,584
Sub-Total	3,798,758	5,484,975	16,098,763
Average	379,876	548,498	1,609,876
2005 – 2006	No data	No data	No data
2011	930,536	1,162,572	17,842,484
2012	227,477	170,187	3,875,569
2013	452,176	459,257	7,138,925
2014	377,416	343,315	6,498,798
2015	758,523	759,622	13,366,618
Sub-Total	6,544,885	8,379,928	64,821,158
Average	549,226	578,991	9,744,479
Total	10,343,643	13,864,903	80,919,921

Sources: Data from 2000 to 2010: Israel & Briones (2012); Data from 2011 to 2015: FPOPD DA
Note: *Consist of typhoons, droughts & floods

Meanwhile, comparing the damages brought to rice production by typhoons per region, the major rice producing regions in Luzon (Regions 2 and 3) suffered the greatest damage from 2011-2015 (Table 16). Of all regions, Region 3 received that brunt of the damage at an annual average of P4.8 billion. Far second to Region 3 in terms of area affected was Region 2, followed by Regions 5 and 1. In terms of value of damage, Regions 2 and 5 were not too far from each other. This type of information would be valuable for immediate and short-term interventions. For medium and long-term interventions, simulation and spatial analyses will be necessary.

Table 16. Regional Damages to Rice Production from Natural Calamities*, 2011-2015.

Region	Average Area Harvested ('000 ha.)	Area Affected ('000 ha.)	Total (P Mn)	Annual Average (P Mn)	Percent
CAR	118	69	994	199	2
Region I	406	268	2,971	594	6
Region II	581	531	5,932	1,186	12
Region III	684	1,053	23,931	4,786	49
Region IVA	114	32	889	178	2
Region IVB	280	117	2,233	447	5
Region V	334	273	5,706	1,141	12
Region VI	636	98	1,702	340	3
Region VII	105	3	156	31	0.32
Region VIII	281	150	1,437	287	3
Region IX	161	10	209	42	0.43
Region X	158	16	632	126	1
Region XI	102	41	366	73	1
Region XII	345	24	1,086	217	2
CARAGA	161	49	258	52	1
ARMM	208	10	223	45	0.46
Total	4,674	2,746	48,725	9,745	100

Source: FPOPD DA
Note: *Consist of typhoons, droughts & floods

Further looking at the annual damage to the rice sector as percent of the *palay* value added, it ranged from less than one percent to a high 11% in 2009 (Table 17). The annual average settles at 3.40% or P6.2 billion a year. While the annual average appears small, this amount is not so far from annual allocation for the NRP.

Table 17. Natural Calamity Damages as % of Agriculture Value Added

Year	Damage to Rice (Php Mn)	Damage to Rice as % of *Palay* Value Added	Damage to Non-rice Commodities (Php Mn)	Damage to Non-rice Commodities as % of Their Value Added	Total Agriculture Damage (Php Mn)	Total Damage to Agri Commodities as % of Agri Value Added
2000	1,595	1.83	1,049	0.25	2,644	0.53
2001	805	0.92	1,395	0.33	2,200	0.43
2002	548	0.57	601	0.13	1,150	0.21
2003	1,320	1.35	2,537	0.53	3,857	0.67
2004	1,698	1.5	5,878	1.04	7,576	1.11
2005	1,942	1.52	2,505	0.42	4,447	0.62
2006	3,401	2.58	7,611	1.18	11,012	1.42
2007	1,882	1.25	3,429	0.48	5,310	0.62
2008	5,015	2.37	8,668	1.07	13,683	1.34
2009	23,842	10.85	5,676	0.68	29,519	2.81
2010	15,559	7.03	9,925	1.12	25,484	2.3
2011	17,842	7.32	4,961	0.5	22,804	1.85
2012	3,878	1.39	28,169	2.9	32,047	2.56
2013	7,139	2.37	26,577	2.67	33,716	2.6
2014	6,499	1.79	33,307	3.13	39,806	2.79
Total	92,967	3.4	142,289	1.31	235,256	1.73
Average	6,198	3.4	9,486	1.31	15,684	1.73

Sources: Data from 2000 to 2010: Israel & Briones (2012); Data from 2011 to 2015: FPOPD DA

The situation for the entire agriculture sector does not look as bad as that for rice with the ratio of total commodity damages to agriculture value added ranging from a low of 0.2% in 2002 to a high of 2.8% in 2009. The average annual damage to agriculture stands at P15.7 billion with rice sector accounting for close to 40%.

Additional spending to address climate change concerns should be as high as the amount of the damage of P92.967 billion or at least about 3.40% of the *palay* value added.

The trends in the climate change damage of *palay*, non-*palay* commodities, and total agriculture relative to their respective value added are clearer in Figure 20. The magnitudes of the damages from 2009 to 2011 stood out. Interesting to note is that despite the increase in magnitudes of damages in recent years, the decline in damage to value added ratios for *palay* in 2012-2014 indicates some degree of resilience in production. Further investigation of this phenomenon should benefit the rice sector as it develops its medium to long-term agenda and strategy.

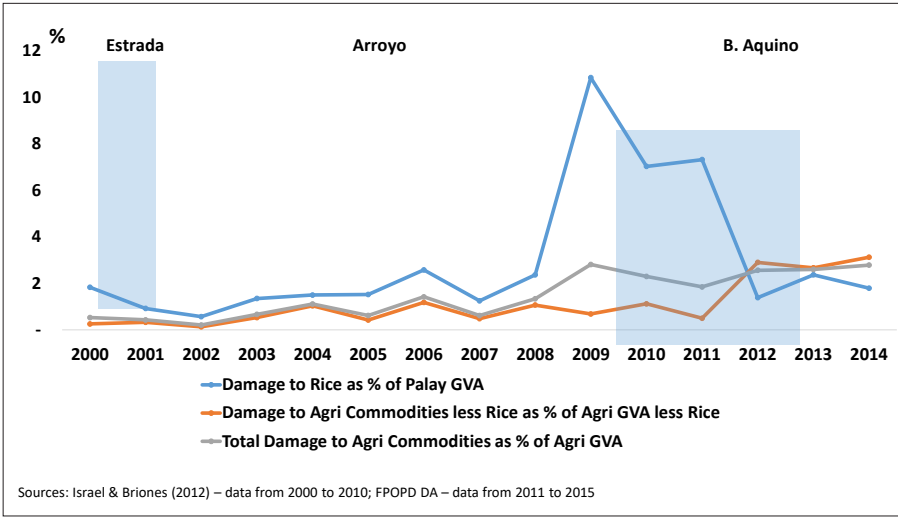


Figure 20. Trends in Natural Calamity Damages as % of *Palay*, Non-*palay* Commodities and Total Agriculture GVA

Rice Farming, Rural Poverty and Rice Extension

From 2002 to 2012, the total area for agriculture had decreased by a little over 2Mha yet the number of farm holdings had increased by half a million (Table 18). This means that farm holdings have become smaller from 1.85 ha per farm holding to 1.29 ha per farm holding or a decrease of 30%.

Table 18. Agriculture and Rice Area and No. of Farms/Holdings

Farm Area & No. of Farms/Holdings	CAF 2002			CAF 2012		
	Area (Mn ha)	No. of Farms/ Holdings (Mn)	Ave. Area (ha) per Farm/ Holding	Area (Mn ha)	No. of Farms/ Holdings (Mn)	Ave. Area (ha) per Farm/ Holding
Total Agriculture	9.29	5.01	1.85	7.19	5.56	1.29
Rice/Palay	3.92	2.15	1.82	2.65	2.25*	1.18*
% of Rice/Palay to Agriculture	42	43		37	41	

Note: * Calculated range - assuming the average of 38% and 43% increase of palay farm holders from 2002 to 2012
Source: PSA, CAF 2002 & 2012

In terms of the percentage of rice/*palay* to agriculture area, there had been a decrease of 5% from 42% in 2002 to 37% in 2012. Data showed that rice/*palay* area has 3.92 M ha in 2002 and 2.65 M ha in 2012, or a decrease of 1.27 M ha or 5% over a period of 10 years. At the same time, the number of farm holdings increased by 100,000 with a smaller area per farm holding of 1.18 ha. Recide (2013) observed that more than half or 57% of small crop farm operators plant *palay.*

The fragmentation of the country's agricultute shows the lack of employment opportunities in rural areas. In general, farmers continue to farm small land holdings, bringing to the attention the issue of economic sustainability.

Meanwhile, looking at the net returns of a typical rice farmer in all production environments, net return had increased (Table 16a and 16b). Net returns per hectare in irrigated rice for both wet and dry seasons were higher compared with rainfed rice. Comparing 2014 vs 2002 figures, the net returns in irrigated areas were almost four times higher. In rainfed areas, the net returns in 2014 were about five times the 2002 values.

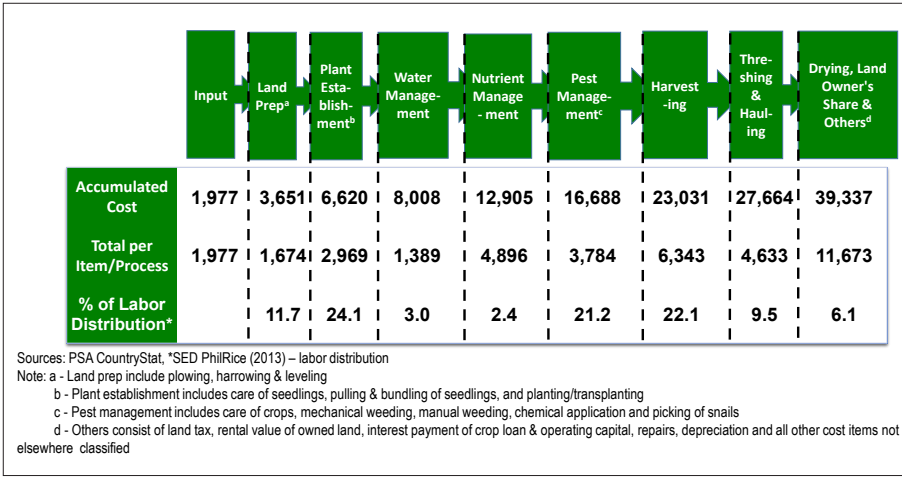
Table 19a. Rice Production Costs and Returns per Hectare per Season, Irrigated areas, 2002-2014 (constant 2005 prices)

Season	2002			2014			% Difference 2002 vs. 2014		
	Total Cost	Gross Returns	Net Returns	Total Cost	Gross Returns	Net Returns	Total Cost	Gross Returns	Net Returns
Dry	27,849	36,268	8,419	32,269	54,510	22,241	16	50	164
Wet	27,146	35,848	8,702	32,307	53,274	20,967	19	49	141
Average	27,502	36,059	8,557	32,291	53,854	21,563	17	49	152

Table 19b. Rice Production Costs and Returns per Hectare per Season, rainfed areas, 2002-2014 (constant 2005 prices).

Season	2002			2014			% Difference 2002 vs. 2014		
	Total Cost	Gross Returns	Net Returns	Total Cost	Gross Returns	Net Returns	Total Cost	Gross Returns	Net Returns
Dry	18,831	21,874	3,044	22,511	32,794	10,283	20	50	238
Wet	18,996	23,642	4,646	25,999	40,043	14,045	37	69	202
Average	18,916	22,757	3,841	24,638	37,326	12,688	30	64	230

Breaking down the production cost according to the sequential steps in rice production, average production cost from 2009-2012 per ha, showed that the highest costs were in drying, land owner's share, and others (Figure 21). These were followed by harvesting, nutrient management, and threshing and hauling. All in all, these four made up 705 of the total expenditures per ha.



Sources: PSA CountryStat, *SED PhilRice (2013) – labor distribution

Note: a - Land prep include plowing, harrowing & leveling

b - Plant establishment includes care of seedlings, pulling & bundling of seedlings, and planting/transplanting

c - Pest management includes care of crops, mechanical weeding, manual weeding, chemical application and picking of snails

d - Others consist of land tax, rental value of owned land, interest payment of crop loan & operating capital, repairs, depreciation and all other cost items not elsewhere classified

Figure 21. Average Production Costs per Ha., 2009-2012

In terms of labor distribution, the top five tasks in man-days are as follows (in decreasing order): plant establishment, harvesting, pest management, land preparation, and threshing and hauling. These key activities accounted for 88.6% of the total.

Further looking at the production cost by environment, labor for either irrigated or rainfed rice accounted for the greatest expense in rice production. It ranged from 24% to 25% for irrigated rice, and from 31% to 34% for rainfed rice. In areas where harvesting was manually done, cost of labor could then go up to as high as 35% for irrigated and 44% for rainfed− tasks that would have strong impact from farm mechanization in terms of reducing the cost of production (Table 20).

Table 20. Distribution of Average Production Costs by Environments, 2009-2012.

ITEMS	2009		2010		2011		2012	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
Input	22	21	20	19	22	20	21	20
Seeds	5	6	5	6	5	6	5	6
Fertilizer	13	11	11	9	13	10	13	10
Pesticides	4	4	4	4	4	4	3	4
Labor*	24	31	25	34	25	34	25	34
Harvester's Share	9	9	9	10	9	10	10	10
Thresher's Share	8	7	9	7	8	7	9	8
Landowner's Share	8	9	8	9	8	8	8	9
Land Tax	0	1	0	1	0	1	0	1
Rentals**	7	7	7	6	6	6	6	6
Fuel & Oil	2	1	3	1	3	1	3	1
Interest payment on crop loan & operating capital	4	3	4	3	4	2	3	2

ITEMS	2009		2010		2011		2012	
	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed	Irrigated	Rainfed
Irrigation fee	2	0	2	0	2	0	2	0
Food expense	2	2	2	2	2	2	2	2
Repairs	3	4	3	3	3	3	3	3
Depreciation	2	2	2	2	2	2	2	2
Others***	6	3	6	3	6	3	6	3
Total	100	100	100	100	100	100	100	100

Note: *Consist of hired, operator, family and exchange labor **Includes rental value of owned land
***All other costs items not elsewhere classified
Source: PSA Countrystat

Inputs in the forms of seeds, fertilizers, and pesticides took up the second biggest expense ranging from 20% to 22% in irrigated rice and 19% to 21% for rainfed rice. The price differentials in inputs between the two production environments could be a function of the cost of seeds. Hybrid seeds, which are grown in irrigated areas are more expensive than inbreed seeds, which are grown in rainfed areas.

Irrigation fee is a small percentage of the total cost of production for irrigated rice. It is a mere 2% of the total cost. As expected, this is a missing cost in rainfed rice. The proposed policy of providing free irrigation services is discriminatory in the sense that it will not benefit rainfed farmers.

Looking at the relative importance of rice as a source of income, it could be observed that it had decreased by 4%. Correspondingly, non-agriculture's contribution had increased by 3%. The slightly increased diversity in income source can be taken as a good sign if taken to mean greater resilience of farming households in times of climate events largely affecting rice. Nonetheless, the absolute decline in rice incomes per hectare is a reason for concern (Figure 22).

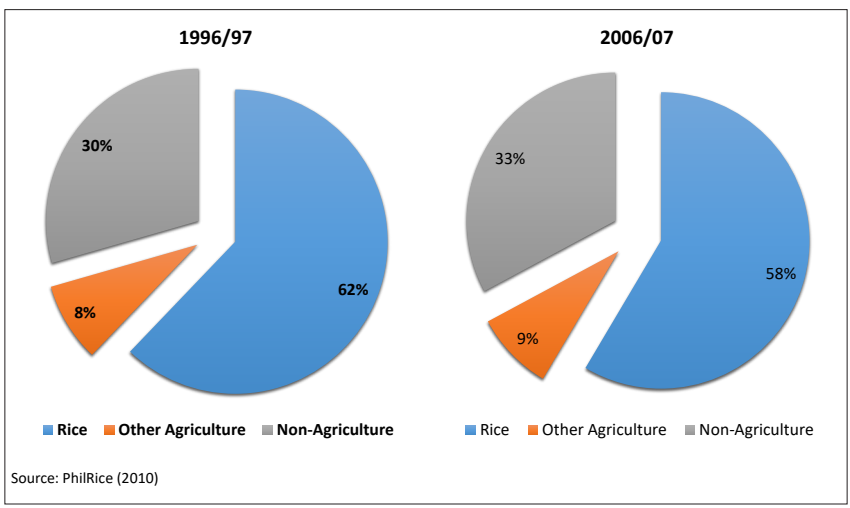


Figure 22. Distribution of Real Income of Rice-Based Farm Household by Source, 1996/97 – 2006/07

Rice farming has become just a side business

Rice farms are now managed by aging household members. As earlier shown, rice farms are getting smaller, and constitutes 57% of the total number of farmers. Perhaps this explains why rice farm income's contribution to household income has become less important. In the 1960s, it was close to 70% but it went down to less than 20% in the 2000s.

The Philippine population poverty incidence had gone down from a high of 49.2% in 1985 to 25.2% in 2012 (Figure 23). Although the reduction during the last 27 years is very significant, it is still relatively high in comparison with other countries. Given the low return to rice production (Table 31 & 32) especially among rice farmers with small land holdings, there is a serious concern whether the goal of rice self-sufficiency is in fact helping the rice farmers move out of poverty.

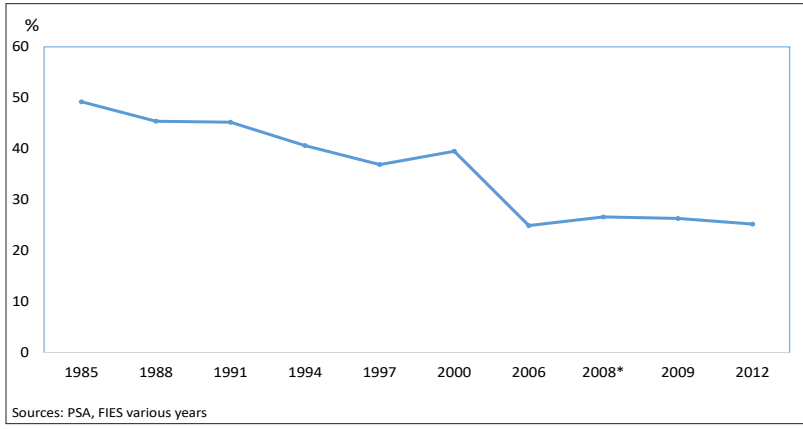
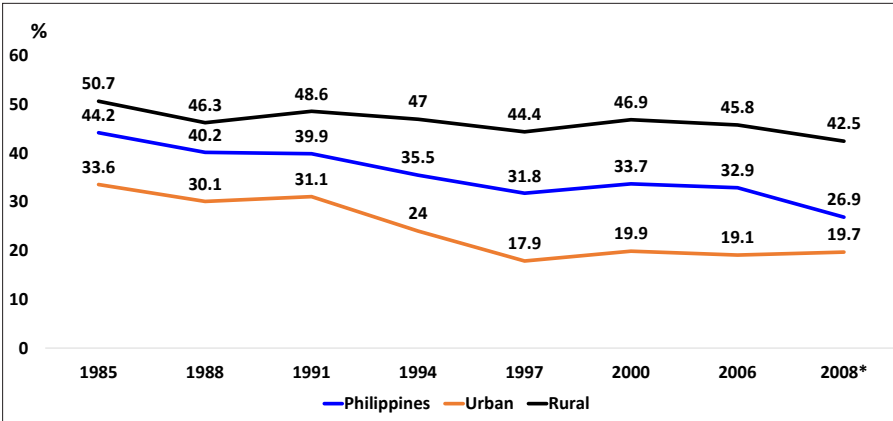


Figure 23. Philippine Population Poverty Incidence, 1985-2012

While poverty incidence has gone down, gap on the magnitude between the rural and urban poverty has been increasing over time. The FIES study on poverty incidence of families from 1985 to 2008 shows that Philippine poverty was essentially a rural phenomenon. In 1985, the gap was 17.1% while in 2008, the gap has increased to 22.8% (Figure 24).



Sources: National Statistics Office— FIES (2006), An Assessment of the Poverty Situation in the Philippines— Reyes (2010), The Poverty Fight: Has It Made a Difference?— Reyes (2003)
*From the Annual Poverty Indicators Survey (2008), not the FIES (2006)

Figure 24. Poverty Incidence of Families, 1985-2008

Looking at the NRP budget, the production and distribution of private goods taking up 51% of the budget seemed to be a doubtful investment in view of its character. The beneficiaries are limited and it is an inefficient means to accelerate technology adoption. In addition, it's prone to rent-seeking behavior. Several COA reports mentioned undistributed machineries and equipment, unverified beneficiaries, rotten seeds, and destroyed fertilizers in the DA warehouses. Recently, the new DA Secretary berated the regional executive director of Region 12 because of undistributed and decaying agricultural equipment and machineries. They remain undistributed due to the failure of the recipients to come out with counterpart funds or the recipients do not have interest because the machines do not meet their needs.

Towards a More Resilient and Competitive Rice Sector: Areas of Reforms in Extension

In order to achieve a more competitive and resilient rice industry the following are recommended:

1. Implement the Landscape Planning Approach to Rice Extension with the following strategic focus:
    a. Sustainable development
    b. Resilience and climate change
    c. Food security
    d. Competitiveness
    e. Poverty alleviation
    f. People empowerment

2. Address the fragmentation and lack of effectivelness of the whole rice extension system
    a. Adopt a rice-based innovations systems framework to create an enabling environment and to identify and capacitate facilitating institutions that will lead to increase in efficiency in the various economic activities along the rice value chain.
    b. Institutionalize quality planning towards greater program effectiveness. Strengthen M&E including EPMR to provide scientific basis for program improvement.
    c. Develop a National Rice Strategic Plan, which, in turn, should result in the development of National Rice Extension Strategic Plan.

3. The Strategic Plan should address the following strategic problems of the Rice Extension System:
    a. The provision of Rice Extension Services at the LGU level
    b. The policy environment of the Rice Extension System. The aim is to identify structural/organizational barriers to effective Rice Extension and institute the corresponding policy solutions by the National Government.
    c. Lack of effectiveness and resilience of the Rice Extension System owing to poor human and physical infrastructure.
    d. Financing a to c above by the National Government in partnership with the local governments.
    e. Develop and institutionalize a “Rice-based Innovations System”

The Rice Extension System: A Reaction Paper

Renato B. Dela Cruz

After hearing the presentation of Dr. Ponce, I felt astounded and at the same time, eager because the presentation is very comprehensive to enlighten us on extension system during the past three decades. The presentation of Dr. Ponce is commendable for his comprehensive analysis of the rice industry, and its situation and performances for the past three decades. The topic "*Towards a More Resilient and Competitive Philippine Rice Industry: The Extension Agenda*" could be more relevant and I could imagine that it could form the basis for sound policy for extension for the DA.

I appreciate the considered common efforts that have been exerted in presenting the data and making sense of the results. I like the presentation shown in tables, graphs, and linear forms. I found the data presentation easy to comprehend and interpret.

The collective findings of the presentation were revealed. First, the National Rice Program (NRP) budget under the component Extension Support, Education and Training Services (ESETS) 2011-2016, ATI was allocated a measly 11% or P467 million out of the total budget of P5.757 billion. The DA-RFOs received P3.9 billion or 46.8% and the OSEC P1.27 billion or 35.3% of the total budget.

Second, the NRP budget breakdown by AFMA Major Final Output (MFO) 2011-2016, ESETS was allocated with 13% or P5.662 billion out of the total P41.985 billion with an annual average of P944 million. On the other hand, the Production Support Services received the highest share with 28% (P11.787 billion); followed by Agriculture Equipment and Facilities Support Services with 21% share (P8.826 billion).

Based on observation, the data presented is not compliant to the provisions of AFMA, which stipulates that extension interventions will become the focus of public investments and shall be allocated a budget of one percent (1%) of the total gross value added (GVA) for agriculture annually.

ATI under the approved DA Rationalization Plan is mandated as the orchestrator of extension delivery systems to harmonize and unify extension interventions. ATI is designated as the DA lead agency in extension and training. However, the budget allocation does not reflect the functions of ATI to effectively discharge its mandate. Take note that under the DA rationalization plan, the RFOs have no funding in extension and training anymore.

The presentation could have been enhanced if information of comparative budget allocation of rice and other commodities like corn, HVCDP, and livestock were done. This data will provide an insight of how much the DA has allocated for the rice program compared with other commodities.

The recommendations of Dr. Ponce on the areas of reforms in extension are

relevant. The provision of Rice Extension Services at the LGU level is well-accepted considering the fact that out of the total of 9,977 agricultural extension workers (AEWs), only 24% are handling the rice program; while 27% are handling multi-commodities (AEWs Profile 2016, ATI). AEWs are functioning as generalist and not specialist that earned them the identity "jack of all trades, master of none". The team approach strategy wherein AEWs will be backstopped by rice subject matter specialist is a good strategy but may entail additional expense on the part of LGUs. Further discussions on the AEW's profile (e.g. age, salary, work assignment, educational attainment, etc.) is suggested for better understanding on the present status of AEWs.

The plan of Sec. Emmanuel Piñol to detail selected AEWs to DA through a MOA with the Department of Interior and Local Governance (DILG) is a step in the right direction. However, a workable guidelines should be formulated to make the partnership effective (e.g. provision of incentives, work assignment, etc.).

The Farmer-Led Extension (FLE) and Local Farmer Technicians (LFTs) are strategies to augment the AEWs particularly in the lower class municipalities. Proper selection, incentives, and capacity building for LFTs should be developed to maintain their credibility and sustain their participation in extension work.

The local chief executives and their policymaking body should be capacitated on the development of extension strategic planning for them to integrate the DA thrusts and priorities in their local development plans (e.g. Rice programs, Climate Change, GAD, etc.). The insufficient support of LGU executives to extension programs led to deterioration of capacity among the majority of AEWs (Contado, 2004).

ESETS program plan and budget in the NRP is fragmented, and the lack of strategic focus on climate change is well taken. It should be realized that extension services are pluralistic in nature. This means that extension is carried out by several actors from the NGAs, SUCs, LGUs, and the private sector. Studies have shown that this condition made extension services fragmented. In the DA alone, there are 29 agencies doing extension excluding the DA-RFOs. This makes extension difficult to manage and harmonize. There is lack of coherence and complementation among agencies (Bordey, 2010; Mascarinas et al, 2010; and Ponce and Baconguis, 2005).

The devolved extension offices have weak linkages with the ATI and technology developers (i.e. Philrice, IRRI, DA RIARCS, SUCs) at the national and regional levels (Bordey, 2010).

To address this and to harmonize and unify extension delivery system, ATI has crafted the following:

First is the National Extension Agenda and Programs (NEAP) 2017-2022. The NEAP was a result of a consultative process among stakeholders in extension. NEAP aims to provide a platform for our country's pluralistic agriculture and fisheries extension that serve as a basis for determining priority for public investment in extension.

Another initiative of ATI is to organize the Agriculture and Fisheries Extension

Network (AFEN) composed of DA bureaus, attached agencies, and corporations that have ESETS and extension activities. The objective is to harmonize and unify extension activities to avoid duplication and overlapping and make use of the government resources more efficiently. The Regional Agriculture and Fisheries Extension Network (RAFEN) was organized at the regional level with the same objectives.

Dr. Ponce's suggestion to strengthen M&E including EPMR to provide scientific basis for program improvement is a timely concern, which ATI has started doing with the adoption of the Results-Based Monitoring and Evaluation (RBME). The performance indicators of extension and training activities have shifted from input/output to outcome/impact-based indicators. In the 2017 budget of the ATI, we have included training support.

I fully subscribe to the use of landscape planning framework for the NRP as suggested by Dr. Ponce with a fully decentralized landscape approach with the provincial government units as fiscal units of implementation. Landscape planning provides a holistic approach to the protection, conservation, and enhancement of urban and rural landscapes, which takes into account the environmental, social, and economic conditions (Landscape Institute, 2006).

The discussion paper of Dr. Ponce has provided a concise comparative analysis of the past and present situation and performances of extension as it relates to the implementation of the NRP. Throughout the discussion, Dr. Ponce has illustrated the issues and concerns, challenges, and opportunities for extension in the country including its devolution to the LGUs. It was highlighted in the presentation that budget allocation for ESETS in the NRP is in contrary to the provisions of the AFMA and DA Rationalization Plan.

The areas for reforms in extension as presented by Dr. Ponce are recommended for policy direction for the rice industry to attain its goal in food self-sufficiency.

Better Rice, Better Life: Revisiting Rice Production and Food Security Through Public-Private Partnership in Agriculture

Nomer C. Esmero

Responding to the challenge of food security has always been a major preoccupation for a government. This obligation to feed the populace is an all-consuming one, to the point that it is considered to be a criminal act not to feed one's people. This is not to say, however, that it is only the government (or what is generally considered as the 'public') who is concerned with the issue of food security. In the recent years, several bilateral and multilateral organizations have taken the task of painstakingly seek for ways to make the world food secure.

This paper is about one of the many efforts to improve the livelihood of the rural farmers and make them primary drivers of food security. It provides insights as to how the project was born and how it intended to proceed. The microeconomic cases presented here are considered pedagogical as to what possible steps need to be taken in order to make rice farming profitable, equally important, and sustainable.

The paper will take off from the origin of the whole initiative. It will demonstrate that the program was conceptualized to address the need about having available food universally. It then proceeds to talk about a country-specific program that caters to the rice industry. It will, then, continue with some updates of the program. Finally, it will share some valuable lessons, which can be considered as talking points for policy formulation.

The German Food Partnership

Smallholder farmers earn more money and have more food. This is the general principle. With this overarching goal in mind, the German Food Partnership (GFP) was launched in 2012 under the umbrella of the Federal Ministry for Economic Cooperation and Development (BMZ) of the Federal Government of Germany together with about 30 companies from the private sector. The companies contribute their specific expertise and experiences to the projects. In other instances, the private sector players commit financial support to the endeavor. Thanks to these financial means of the private sector, it is possible to reach significantly more smallholders across the globe.

The GFP aims at fostering the cooperation between the German private sector and public sector institutions in emerging and developing countries. The partners endeavor to contribute to the development of a sustainable strategy across the public and the private sector to enhance food security and economic development. Under the BMZ's

'One World, No Hunger' project is the goal to ensure availability and affordability of safe and nutritious food. The project Better Rice Initiative Asia (BRIA) aims to optimize rice value chains in Southeast Asia. Another objective is to improve rice-based nutrition for the Asian market.

The Projects under the GFP-'One World, No Hunger'

Since its inception in 2012, the GFP has been implementing three major projects, all of which had claimed relative success in what the GFP had set forth to achieve. For instance, within the framework of the pilot project "Potato Initiative Africa (PIA)", potato yields of smallholder farmers in Kenya have quadrupled. On the other hand, new potato varieties have been tested and compact agricultural machinery has been used. Likewise, in the other two projects launched under GFP, BRIA, and Competitive African Rice Initiative (CARI), smallholders learn how to increase their yield through modern farming techniques and by actively searching for opportunities to improve their marketing along the value chain.

However, there is an equally important goal that the GFP was able to achieve within its term from June 2012 to March 2015. Through the exchange and pooling of all forces for cooperation especially with the private sector, important learnings for future cooperation were made. On its part, the BMZ will continue to count on cooperation with the private sector as a proven and effective instrument to fight poverty and hunger.

Reining in the private sector and playing by the rules

The BMZ through the GFP had embarked on a very ambitious journey for the underdeveloped world. It targeted 500 million people to be lifted out of poverty and hunger. That is why, it was actively seeking contribution from the private sector. Companies bring additional financial resources and expertise to the projects. In contrast to projects solely funded by the public sector, a significantly higher amount of smallholder farmers is reached.

Nevertheless, cooperation with the private sector will only be realized if local people benefit from the project, for example, by earning more income. Therefore, all projects were agreed on in close collaboration. This includes governmental organizations, as well as scientific research institutes. Even partners from civil society, such as non-governmental organizations (NGOs), contribute their knowledge. This way, demand-oriented and locally-adapted advice can be given.

To secure the interest of the smallholder farmers, the BMZ has established a catalogue of set rules that requires all partners to follow or adhere to. These include product neutrality and freedom of choice according to various farming practices and inputs. Furthermore, pesticides and fertilizer can only be applied if they comply with approved standards set by the World Health Organization (WHO) and protocols mandated by the governments in Europe and Germany.

Given the issue and the context by which the GFP operates, there are three projects

implemented under its umbrella. The PIA is being implemented in Kenya and Nigeria. On the other hand, The CARI is being undertaken in Tanzania, Ghana, Nigeria, and Burkina Faso. In Southeast Asia, the BRIA is implemented in Thailand, Vietnam, Indonesia, and Philippines.

What is Better Rice Initiative Asia (BRIA)?

In most Asian countries rice is the main staple food. However, their production system mainly comprises smallholders who produce either for themselves or for the local market. Only about 5% of the quantity grown is exported. Rice is thus, the most important crop cultivated in Southeast Asia for food supplies and local value creation.

At the same time, population growth in Asia is driving an ever-greater demand for rice. It will no longer be possible to satisfy this demand in the future due to stagnating yields, shrinking cropping areas, an ageing rural population, and the accompanying shortage of labor, as well as climate change. To secure food supplies in the long run, it will therefore be necessary to modernize smallholder farms. This can only be achieved if the farmers have access to agricultural extension services, financing, markets, and farm inputs.

The smallholders can overcome these challenges if they are integrated in a functioning value chain that covers all steps of a food life cycle from planting to processing and marketing.

As one of the initiatives under the GFP's 'One World, No Hunger', BRIA was established by several industry partners and the German Development Cooperation (GIZ). The project basically aims to increase the incomes of smallholder farmers by increasing production, enhancing market linkage by improving the rice value chain, empowering the rural sector by training, and improving rice nutrition in partner countries. To understand the initiative further, it is important to note that in crafting this course of action, the GIZ looked at the following challenges.

- Food Security
    - The fast pace of population increase in Asia entails rising demand for the staple in the continent. In Indonesia alone, the demand is estimated to increase by as much as 40% in the next 25 years. It is a reality that rice is the most important staple food in Asia. By working to improve the rice sector, the GFP is helping to enhance food security in the region. It aims to boost harvests and to give more people access to nutrient-enriched food.
    - Another regional problem is malnutrition, the so-called 'Hidden Hunger'. Vitamin A deficiency causes blindness in children and without zinc, they suffer from growth retardation as well as weak immune systems. Consequently, a prominent task remains for governments to provide a broad base of the population with safe, nutritious, and affordable food. This is what BRIA also wishes to address.
- Market Access

- Rice market is often characterized as inflexible and highly sequential. The system operates in such a way that the business dynamics leave a very little elbow room, to the detriment of the smallholder producers. To address this, many of the measures take the strengthening of the farmers' organizations as their starting point. The intention is that the farmers' groups can be integrated into inclusive business models with rice processors and traders. While it opens a wider opportunity through greater leverage, they can benefit from economies of scale when purchasing machinery and seed, and find it easier to access financial and other services. Expansion of the smallholder producers' social capital can be achieved and, in the long run, will be beneficial to the farmers.

- Modern and knowledge-based rice industry
  - Enhancing the range of training available is a central challenge for the GFP project. Given the high average age of the farmers, it is also important to make rice farming attractive to the younger generation.
  - To achieve food security and improve incomes of rice farmers in South East Asia, farming businesses have to be modernized. Until now, most farmers live on subsistence farming, often with no access to local markets. Farmers lack knowledge about efficient agricultural practice, environmentally friendly production techniques, and access to finance and local, as well as regional markets. Government extension services often lack personnel and financial resources to train smallholder farmers accordingly.

- Sustainable production
  - It has always been argued that rice production continuously faces hard-pressing constraints. These are stagnating yields, climate change, environmental degradation, decreasing cultivable land, and lack of young rice farmers because of low incomes and limited market access. The rice sector is highly vulnerable to climate change. Adapting farming methods to climate change and introducing climate and resource-friendly technologies are the tasks facing this GFP project.

BRIA in Asia

Indonesia and Philippines are import-reliant for their rice supply. In this regard, the project aims to increase yield and quality of rice production in these countries. For instance, the project aims to establish 375 centers for sustainable rice production until 2017 in the provinces of North Sumatra, East Java, and Central Java in Indonesia. The projected 125 trained agricultural advisors will teach 7,500 rice farmers, which will act as multipliers in their respective communities. Aside from the farmers' training, rice millers are enabled to fortify their products with micronutrients such as vitamins, iron and zinc. BRIA, moreover, is supportive of the Indonesian Government's program to establish social security systems which provide nutritious food for poor people. As a first step, BRIA conducts studies showing the effectiveness of fortified food as

potential means to fight malnutrition.

In the Philippines, BRIA aims to train 200 communal agricultural extensionists and lead farmers in the provinces of Iloilo, Aurora, and Southern Leyte. As in the Indonesian case, they will be trained as multipliers to improve farmers' knowledge on rice farming and marketing their produce. Furthermore, innovative marketing channels for rice farming will be established. On the other hand, BRIA supports government policies on Food Self-Sufficiency, to decrease dependency on rice imports. The project aims to increase the yields of 8,000 rice farmers by 20% and their incomes by 15%.

Thailand and Vietnam, in contrast, are rice exporters. Here, trainings focus on efficient and conservational farm practices, such as reducing the application of toxic crop protection substances.

In Thailand, with the help of trainings in so-called Community Rice Centers (CRCs) supported by BRIA, smallholder farmers can increase their incomes by up to 20% and reduce pesticide application by 405%. To decrease post-harvest losses, improved post-harvest management strategies, such as optimized storage and drying techniques, are developed together with the Thai Rice department. The project supports the processing of byproducts in rice production. In about 200 CRCs, lead farmers will be trained as multipliers for sustainable rice production in the northeastern provinces of Ubon Ratchathani, Roi Et. Sisaket, and Surin, reaching a total of 10,000 farmers. Furthermore, BRIA together with its public and private partners, produces an edutainment TV show in which two teams of farmers from Ayutthaya and Suphanburi provinces impart knowledge about responsible and judicious use of production inputs to their peers. The show is aired on an agricultural channel.

In Vietnam, BRIA is engaged in the provinces of Dong Thap, Hau Giang, and Kien Giang. The objectives are to improve rice quality and farmers' incomes, promote market linkages, and enhance the capacity of farmer cooperatives by fostering multi-stakeholder partnerships between farmers, rice millers, input suppliers, and government extension service workers. In total, about 3,000 rice farmers will participate in training and consequently, produce several thousand tons of socially and ecologically sustainable rice annually. Introduction of rice quality standards will facilitate marketing and raising rice farmers' incomes by up to 20%. To understand deeper what BRIA intends to do, the diagram below will be explanatory.

BRIA aims to improve rice production and rice-based nutrition by adopting a holistic value chain approach. This should enhance the income situation of producers and the nutritional situation of poor households. Know-how, technology transfer, and building up agricultural extension services should increase productivity levels in rice cultivation. In this way, BRIA is helping the participating countries to achieve their national development strategies in the agricultural and food sectors.

BRIA in the Philippines

The Philippines is one of the big rice-onsuming countries worldwide. Despite having a long tradition in rice cultivation, Philippines remains dependent on rice imports, being one of the biggest rice importers in the world. It is no wonder, then, that

food security and raising incomes are the overarching goals of the agricultural sector under the Philippine Development Plan (PDP) 2010-2016. Toward these goals, the DA launched the Food Staples Sufficiency Program (FSSP), the goal of which is to achieve self-sufficiency in food staples.

Needless to say, food security in the Philippines is closely linked to rice production. Rice provides 45% of the caloric intake of Filipinos. It accounts for 20% of the typical households' budget. More than two million households are engaged in rice-based farming: millions more of farm laborers and tens of thousands of merchants depend on rice farming and trading for a living. Rice is a major industry, and rice is considered as a major currency of exchange, especially in the rural areas.

However, recent studies show that public investments in key public goods including irrigation, R4D, and extension have stagnated in the last few years. They will require beefing up. More resources are necessary. Nevertheless, the effectiveness of investments and service delivery also need improvement. An effective extension system that can spread knowledge, skills, and technology to farmers is critical in closing yield gaps, and ultimately addressing economic pressure in the farming households, especially the smallholder farmers.

At the local level, a key challenge is to mobilize AEWs employed by autonomous local government units (LGUs) in provinces, cities, and municipalities. Low priority and inadequate funding have led to the deterioration of LGU-provided extension services. Mobilizing the private sector leverages limited with public resources by marshalling additional financial resources and benefiting from synergies.

Towards these challenge, the project aims to contribute to the vision of the PDP on a competitive, sustainable, and technology-based agricultural sector supported by efficient value chains, which contributes to inclusive growth and poverty reduction. For this purpose, a project was started in 2014 to specifically address the rice sector in specific provinces and regions. The project is called BRIA-FARMERS.

Better Rice Initiative Asia– Fostering Agriculture and Rice Marketing by Improved Education and Rural advisory Services (BRIA-FARMERS)

Project Concept/Summary

The overall project objective is to contribute to achieve the goals under the PDP for a strengthened agricultural sector and improved food security in the Philippines. The focus is making rice farming more productive and even more profitable. Farmers' market position, income, and food security shall be improved by strengthening agricultural extension services. In this case, the range of extension services need to be defined in the annual operational plans with due consideration of the requirements of project sites. The project believes that this will lead to improved farmers' access to extension services and an improved access to markets.

The project will have three components. In component 1 (Better Rice Production) the capacities of AEWs shall be strengthened through education and training, and access to extension services from farmers shall be improved. It focuses on an improved rice-based farming systems by introducing enhanced farming technology concepts from seed to harvest (land preparation, planting, crop care, harvesting). Component 2 (Better Market Linkage) centers on providing farmers a better access to markets. Support to farmer organizations' formation, improvement of market and price information as well as linking farmers to retailers are the main activities under this component. Component 3 focuses on the documentation of the lessons learnt and good practices, and will be shared among partner agencies at national and regional levels.

Project objective and objective indicators

The overall project objective is for farmers in selected LGUs improve their market position and income, and contribute to an enhanced food security.

The achievement of the objective will be measured using the following objective indicators:

1. 70% of 200 trained AEWs, farmer leaders, and private service providers have applied their knowledge on value chains, basic agriculture, rice specific farming techniques, and enhanced methods on training delivery (Baseline 2013, biannual assessments based on farmer interviews, indicator fulfilled by end of the project).
2. 80% of 8,000 advised farmers achieve 20% yield and 15% income increase in rice production compared with provincial agricultural average (Baseline 2013, biannual yield assessments by samples of supported farmers compared with statistics of Bureau of Agricultural Statistics, indicator to be fulfilled by end of the project).
3. 40% of 8,000 advised farmers have confirmed an enhanced knowledge on the local rice market and its marketing channels. Long-term agreements between advised farmers and retailers increased by 20% by considering risk management options and micro insurance. (Baseline 2013, biannual assessment and documented contracts, indicator to be fulfilled by end of the project).
4. Developed training modules and good practices on production techniques, marketing, and stakeholder cooperation are documented, disseminated, and accessible as public goods submitted to DA (documentations, minutes of meetings, indicator to be fulfilled by end of the project).

The Philippines component of BRIA aims at building the capacities of AEWS in selected LGUs as well as private service providers and farmer-leaders on methods and tools for the provision of extension services to farmers through education by the FARMERS school. These service providers will be enabled to disseminate their gained knowledge. They will function as multipliers for basic

agricultural knowledge, entrepreneurial topics, and improved climate sensitive rice farming techniques to farmers in the supported LGUs. The FARMERS school will be organized by GIZ and is based on the DA-ATI in Regions 6, 8,, and PhilRice Central Experiment Station in Region 3.

The FARMERS project is developed between the project partners (PhilRice and DA especially ATI). The FARMERS school will be hosted at the DA-ATI and the PhilRice Central Experiment Station. The training module that will be developed under this initiative will be free for public use. The target group will be some 8,000 small-scale rice farmers (between 0.5 and 5 ha).

The project shall be implemented in Region 8 (Eastern Visayas), Region 6 (Western Visayas), and Region 3 (Central Luzon) in the Islands of Leyte and Panay, and Aurora Province. Leyte, Panay, and Aurora are regional hotspots for food insecurity because of low productivity as most households rely on agriculture. Poverty incidence in these areas is much higher than the national average. The project could expand to further provinces on a later stage for up-scaling.

As the project aims to strengthen the rice sector along the entire value chain, the project will cooperate among others with VDMA to constantly search for valuable partners, inputs, and contributions during its implementation. The concept needs to maintain certain flexibility to be able to respond and adjust to changing conditions.

What have been achieved?

After three years of implementation, the following are considered as important milestones of the project:

1. There have been series of technical briefings for all partners which include the ATI, PhilRice from the government sector, and Bayer Crop Science for the private sector. These briefings focused on a number of issues including terms of cooperation and salient project characteristics.
2. There are 13 municipalities selected for the project. There are four in Aurora (Region 3); six in Iloilo (Region 6); and three in Southern Leyte (Region 8). These LGUs have been provided with financial assistance that would finance training activities as deemed necessary by the respective LGUs.
3. Several courtesy calls were also conducted both at the national and local levels. One of the key outputs of the said courtesy calls is the preparation and subsequent approval of the financing agreements granted and entered into by the LGUs and the GIZ.
4. A number of Training of Trainers (ToT) for AEWs and lead farmer-technicians were also conducted in each province/region. Table 1 shows the summary of the trained AEWs and farmers under the ToT activity.

Table 1. Trained AEWs and Farmers.

Region	AEWs		Farmers	
	Male	Female	Male	Female
Region 3	10	20	17	10
Region 6	38	45	1,326	1,511
Region 8	13	14	173	103
TOTAL	**61**	**79**	**1,516**	**1,624**

5. In the coming months, another series of training will be rolled out. This will be conducted in the BRIA-LGUs and other LGUs, which may be determined by partners and other stakeholders.
6. There are also series of trainings that were provided. The AEWs and the farmers also learned about the principles of adult learning and farming as a business. They were also trained on product stewardship, which basically focuses on the proper handling and use of chemicals and other farm inputs.
7. There are 80 demonstration plots established recently across the regions. The demonstration plots will serve as showcase for both the farmer's practice and the BRIA-led technology. The latter is basically based on the *PalayCheck* System.
8. A training module to be used in future trainings is now being finalized. This module can also be used by the ATI and PhilRice in their respective training even beyond the BRIA tenure.
9. A couple of marketing agreement had been facilitated. This market linkage model addressing the value chain is being pilot-tested Iloilo. This will be replicated in Southern Leyte and Aurora in the future.

Some concluding remarks: the way forward

BRIA works at various levels with a large number of different cooperation partners who vary from country to country. In each of these countries, the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH works on behalf of the Federal Ministry for Economic Cooperation and Development (BMZ), and in the framework of the program development on the establishment of the project structure, and organizes, monitors, and coordinates the project activities. GIZ also develops training materials and conducts training for farmers, agricultural extension workers and employees from public institutions.

Instead of looking at the challenges entailed and faced by such partnership, it is rather helpful to look at the lessons this imparts. For this, there is a number that need highlighting. For one, there is a need to continually update training curriculum. There

is a need to include in the curriculum other topics that are nevertheless connected with rice production. For instance, the wide reception and positive response towards the topics on farming as a business and adult learning are a proof of this. Updating of the training curriculum entails the integration of other topics that can be beneficial to the smallholder farmers. Incidentally, some of these topics are integrated into the training module that is being finalized.

Secondary, and quite related to the first one, is the need to highlight the role of the private sector in these types of partnership. In the experience of BRIA, private sector companies support BRIA on various levels. It is important to note that all participating companies share the goal of creating sustainable rice production systems to improve the food security in the project countries. BRIA partner companies share their know-how and experience with local companies and government institutes. The important lessons on adult learning came from the private partners. So was the input on farming as a business and product stewardship. Bayer Crop Science and Yara Fertilizers support development of training curricula for agricultural extension officers and the production of training materials for smallholders. Bayer Crop Science, additionally, supports the independent monitoring of project activities.

While at this and, lastly since this is a formal partnership for development, there is a need to develop some guidelines that will govern such other partnership. The lessons learned in this experience may be a good starting point in formulating and finalizing such guidelines. While there might be PPP for infrastructure project, there is a need to develop one for the development partnership, especially in agriculture. At this pace and direction where development work is going, PPP is the way forward.

Support Services for Farmers: A Reaction Paper

Ariel T. Cayanan

First of all, our congratulations to the primeover of this workshop. We cannot overemphasize the objectives of this activity just as we cannot overemphasize what we – the national government, the private sector, and all stakeholders- have done to unravel the age-old issue of producing and providing enough of our basic food staple for our countrymen. To say that we have devised all possible strategies in our effort to demystify the rice issue may indeed sound an understatement simply because it's an issue that refuses to go away – what with the bourgeoning population and sub-issues on productivity arising from climate change and the perennial struggle to mount an adequate and sustainable enough rural support service delivery system that would match field realities.

It will be recalled that, just last year, we embarked on a series of multi-sectoral **Rice Summits** nationwide, ostensibly with the objective of casting another, albeit serious, look at our rice industry and what else needs to be done to bring it to a higher level of development existence. As expected, these summits resulted in a plethora of policy and program recommendations designed to propel the industry to a position where it can bridge the chasm between supply and demand, between existing and potential yield levels, and between the Philippine experience and those of other countries, particularly our Asian neighbors. In short, our concern about productivity, competitiveness, and food security has always under planned all our discussions relating to the industry. It will be instructive to render not only a passing but cursory look at these recommendations and make it a springboard for today's discussions.

With regards to support services for farmers, let it be said that this remains the recurring theme of our program interventions, in fact of our existence, which explains our continuous involvement in the provision of input support, including the distribution of quality seeds and fertilizers and even mechanization support, in strategic areas where these can meaningfully contribute to the attainment of our production targets. This is on top of our usual efforts to strengthen research, extension, and marketing support in as much as the issues at hand, as has been contended repeatedly, could be better addressed if viewed holistically or from a value chain perspective.

This holistic approach to development is, incidentally at the core of the BRIA project, which was presented in greater detail earlier by our resource speaker, Mr. Nomer C. Esmero. This project, as described, reinforces the role of extension and marketing services, along with private sector participation, in shifting farmers towards a more heightened adoption of production protocols, to increase yields and rural incomes, and achieve a measure of food security. These same pillars aimed to enhance productivity similarly underpin our three-point agenda for agriculture under the new administration which, as has been pronounced, embodies our initiatives to facilitate:

(1) fast and effective agricultural technology transfer to farmers; (2) easy access to financing; and (3) efficient marketing for farmers' produce.

A concrete articulation of this agenda, recently, is our proposal to launch the LGUs' Corporate Farming Systems whose ultimate goal is to increase our available rice supply while raising productivity and rural incomes, and ensuring consumer welfare through institutional arrangements linking production to credit and marketing and other support services, with LGUs as frontliners. This scheme may not introduce a new paradigm but will instead project what is doable given the political will to undertake a development initiative. This, likewise, offers a platform to look into the off-cited issue on extension support to agriculture which, as claimed in several studies, has posed a major development deterrent.

All told, this workshop may yet afford a chance to revisit the issues impinging on agriculture, particularly on rice production and food security, and how the different programs/interventions so far have helped address these issues. The new insights gained from the discussions may yet serve as trajectory in lifting the industry to a higher realm of development.

OPEN FORUM

Rice Research for Development

ABNER MONTECALVO: We have a lot of studies being conducted but a lot of them are on the physical sciences. I fail to see social- and policy-related studies. I think the major problem of the rice industry or the agriculture, in general, is more on the political resolution. For instance, the agrarian reform law. Is it really effective? The big landowners are the ones who benefit the most [from government programs].

So I think looking at the issue of the DA, our thrust is how are we going to improve the lives of marginalized farmers? Have we improved them? I think we need to come up with a research that deals primarily with social and political issues. There are a lot of policies that are not properly implemented. We should look into that. On the social aspect, it has something to do with relationship, and even cultural.

The best way to empower farmers is to organize them. But I think even with regards to this aspect, our farmers are not really empowered because they are not organized. Who will do the organizing? Of course, the government should serve as catalysts in strengthening the credit. [They should] work with the farmers and even to die with the farmers. I know we are not all scientists. Based on my observation, farmers' situation hasn't change much. I think our problem is really serious, and we need a revolutionary action to solve this problem. If not now, when?

MR. CABRERA: I appreciate what you have said, Sir. I mentioned earlier that we are ready to prioritize socioeconomic analysis. I just failed to expound because of the limited time given. But I've mentioned that there are policy and social-related studies, like those assessing the existing land reform. I just didn't have the time to expound.

ABNER MONTECALVO: But are we affecting the existing land reform? Is it a genuine land reform?

MR. CABRERA: Yes, I acknowledge your concern. It will be part of the research activity that we will be pursuing. Let's just give the researchers more time. We are already looking into that. Also on the social aspect, we are implementing a lot of these already. I was just unable to show them here. I can provide you a copy of the detailed activities of social-related studies.

DR. ELISEO PONCE: Two observations. [I think] the weakness of agriculture now—the whole economy—is that we are not looking into the hardware component. We talk about mechanization, but we are not talking about manufacturing our own machines. Of course, this is another industry or department. It is not perhaps a prime thrust of the DA but we should think of something like this so that we can request from the Department of Trade and Industry (DTI) and National Economic Development Authority (NEDA), and emphasize [that] we need the machines! We have outdated machines. When you go out in the field, you say is synchronous transplanting [is better] but how can we do synchronous planting when we don't have the machines? How do we save our rice ready for harvest if we don't use machines? These combine

harvesters– we don't have them. They are only imported. We say, "Hey, we need to overcome climate change" but there is no study on how we can reduce carbon emission in rice production.

DR. FLORDELIZA BORDEY: We've seen in the presentation the machine development. Specifically, we have ongoing development of [local] combine harvesters and then dryers in the future which may help increase climate change resiliency. The question now is after designing these, how can we commercialize it?

I can suggest that we could work closely with the private sector. We could establish partnership with them so that we can ensure the commercialization of the technologies we develop. We cannot expect research institutions like PhilRice and PhilMech to do the mass production and commercialization because it is not really their mandate to commercialize. They are only into research and development of designs. We have to work closely with the private sector.

DR. FERNANDO BERNARDO: Just a suggestion. Well, I came because I am interested. The presentation is very good particularly the long and very comprehensive list of researches. Very good. But we know that (1) our resources for research are very limited; (2) we don't have all the people to do this type of research. So my suggestion to BAR is to identify the big problems of agriculture, which if we can solve, would have a lot of impact. Prioritization is very important so that all of us can focus. Given the limited resources, we can focus on the most important programs or projects, which if implemented can have a lot of impact.

Marketing and Trade

MR. DARIO (EASTERN SAMAR): I was waiting for someone to raise the profit margins of marketing players. Based on observation, farmers are just price takers; traders dictate the price. Traders' price is what consumers observe. This is one of the reasons why traders receive higher profit margin than farmers.

ROEHLANO BRIONES: I admit that it is true in certain places. I have seen farmers like this not only in Samar. The price drops during harvest season. However, in other places, if you ask the trader whether they could dictate the price or not, they would say "How can I dictate the price? If I offer a lower price than other traders, the farmer would sell their produce to my competitors". The best resources at both levels are competing. There are places with limited choice where we can have probable resource for procurement or wholesale *palay* station.

ISABELITA PABUAYON: Can I add to this? It is probable that farmers can choose to sell their produce to a trader who offers a higher price. But sometimes, it is not what happens. Farmers are bound to sell their produce to their trader-creditor to pay off his debt. Then the farmers' income from the remaining *palay* is normally used for household expenses and nothing is left for the next season's capital. The farmer then would borrow capital again from his/her trader-creditor. We can really say that farmers are able to choose buyers of their produce if this case is not happening.

REYNALDO CASTRO: I agree with that point. Using the estimated cost of production, the government can keep the floor price at the minimum. The margin set will be constant. In that way, there would be competition among traders. At the same time, farmers can be assured of a profit. This is what Dr. Pabuayon was saying that we should have a compromise among traders, producers, and consumers. I think the government and the traders should agree to set the margin for the selling price. Is this possible?

Another point, if I recall, cooperatives are not always there. They just come and go. Can we have another model by which we can convert the individualistic attitude of Filipino farmers into a cooperative one. This would be beneficial to them.

ROEHLANO BRIONES: Okay, it is a good idea to set the floor price. Now, there are two major crises in the economy. The minimum rate which is tied-up for negotiation. As of now, we have standardization for this. So why do they negotiate? They try to negotiate to compromise. Of course, farmers are better off if they could increase their floor price. So you find a negotiator who can compromise.

Another thing is imports. We try to centralize the buying station. However, buying activities outside the station exists. I hear there is cowboy trading. The other question is how to organize a few centralized arears? We want to attract farmers and buyers to converge to these centers. One of those attractive services would be standardization of the product. Outside the centers, there are categories. In the buying centers, they implement what the government has set. With similar categories, we can ask local processors to reform. I think through these buying centers, we can implement progressive arrangements similarly.

ISABELITA PABUAYON: There are too many rice areas all over the country. It is very difficult to enforce a relation like that. Regarding the cooperatives, I think one thing is that the concept of collective action and cooperation. Because I see that cooperatives should be voluntary. Cooperatives should arise out of the need of members. We cannot dictate farmers to organize themselves, unless it is beneficial to them. It is only through voluntary actions of members that can make cooperatives work. Also, we cannot disregard the fact that there are existing successful cooperatives. There are many of them now.

When I was still younger, we had really bad impression about cooperatives. But now, there are a lot of good cooperatives. We have a very good example in Batangas which is a billion-peso cooperative. Their nature of business is feed-milling. Members are livestock farmers, so the cooperative is supplying feeds to their members. For corn farmers, they supply raw materials to the cooperative's feed mills. Their arrangement is so good. The cooperative has other business functions and these are related to what the members need. Therefore, members should really feel that they are organizing for an economic reason, and that they should transform the cooperative into a viable business enterprise.

In reality, a cooperative is just one of the four business organizations. It must not only serve as a credit line for farmers but also as an enterprise. It should run as a business organization to help make it more sustainable. Unfortunately, in the past, one of the

issues in cooperatives is mismanagement. Cooperatives need professional managers, a graduate of a business course, maybe from the Asian Institute of Management.

Support Services for Farmers and the Rice Extension System

JAIME MANALO: I noticed on Sir Nomer's presentation that BRIA focused more on capacity enhancement, training programs, and stuff. I also want to reconcile the focus of this event, this policy forum. I wonder why BRIA is focused on capacity enhancement, which is in relation to training. In relation to policies, what policies that we cook up as for capacity enhancement programs that BRIA is bringing?

NOMER ESMERO: The second component of BRIA is market linkage. Two weeks ago, we launched a marketing agreement of farmers' association with traders in Iloilo. BRIA is not only focused on capacity enhancement, it also has initiatives on improving the policy, but we want to emphasize more on farming as a business. Putting it into the context, we can organize farmers but we aren't able to sustain them because members are not adept in their management skills. That is why, we focus on human and social capital of rural farmers. We want to strengthen this capital. I am not sure if this could be a policy matter or just a simple module. Maybe an additional module for training. Thank you.

ARIEL CAYANAN: I would like to integrate more because there are many implementations that we are very excited to begin with, without looking first at what we have and how capacitated we are in implementing it. I'll give you a classic example. Our program on "*paiwi*" system. We are very excited to implement the project. We gave out livestock but when it's time to give it back to farm owners, the livestock has been butchered already. We need to find ways or schemes on how to make the programs sustainable. In this case, we are going to implement the "*paiwi*" system in selected municipalities. But first and foremost, we need to train our recipients. If they have an area, you put the stock there and let it prosper, and then the recipients will be the ones who will distribute.

Another thing is we want to support private farming in the corporate farming system. The problem is that the law prevents us from doing so, because the law says we are not mandated to support directly in the form of implementing on private sectors. Policies on this should also be reviewed. That's why we shifted to local government units because they are the ones mandated to do corporate farming. Therefore, if we can review and amend or improve some of the policies, implementation would be more efficient.

ABNER MONTECALVO: For our speaker, Mr. Esmero. I know that your organizations' (i.e., BRIA) targets are Luzon and Visayas areas. With the multinational buyers and some big corporations that distribute fertilizers, could it be possible that these corporations use BRIA to expand their products?

Another comment on the compensation of agricultural extension workers. It is really very true that their salaries are very low. I think this is not the job of the DA, but of the Department of Interior and Local Government (DILG). The best that DILG could do is to adopt what the President [Duterte] did to the salaries of our police force;

he doubled their compensation. If this has been done for the police force, then why not do this for the frontliners of food security in the country. Maybe, our extension workers should be given thrice of their current compensation. These are the policies and issues that we need to examine. I hope this message could reach the President, the message that our food security relies on the hands of our people in the field.

ARIEL CAYANAN: Well, of course, we have limited power and authority, first and foremost. The power to appropriate or dispose the national budget is not on the hands of the President but is actually on the hands of the Congress. Those are two contradicting things.

Policy-wise, there should be takers, but those who are expecting to take it did not actually function. A very good example is the irrigation given a while ago. The mandate of the National Irrigation Administration (NIA) will be for the national level, right? For the communal, NIA has to initiate but later should be taken over by the LGUs. However, only few, I could count them with my fingers, who among the LGUs have responded well. So, it became an inherent function of something that we expect to happen. So, I believe you are right. Everything should start with the right policy.

NOMER ESMERO: Two questions basically: Why BRIA has no operations in Mindanao and why do we partner with multinational companies? We do not have operations in Mindanao because when BRIA started, peace and order situation in Mindanao was very critical. Second reason is that private companies are not yet ready for mobilization in Mindanao. Areas in Luzon and Visayas, except Southern Leyte, have Rice Processing Complexes (RPCs), which can be easily established at the second component of the market linkage. If there were any rice-processing complex in Mindanao, mobilization of private partners would be limited.

Why collaborate with multinational companies? Because they are German multinational companies. But this doesn't mean that we are promoting their products. In fact, a no-product-placement is included in the terms of reference of our agreement. As you can notice, our logo and even that of our partners do have any labels. Secondly, we value farmers' free choice. Just to give you a story. We are maintaining demo sites. Out of the eleven demo sites, none of them planted *Bigante*, a product of Bayer. This is because we agreed to observe no product advertisement. Even in school and field days, we do not allow these companies to place their own products, not even a booth. If there would be an instance, I think it is not intended to be part of the program we are implementing. So these companies know very well about our no product placement, and that we should value the farmers' situation. To tell you honestly, we experience a stricter questioning from other countries. Like one time, a colleague called me at midnight because he reported that someone has questioned one of our modules. They reported that a product advertisement of Bayer was in one of our modules. I browsed through the module, and find out that they [Greenpeace] have referred to an old version of the module. We need to answer such issues because they said that this is a German's stock payer's line, so we have to ensure that there would be no product advertisements.

FLORDELIZA BORDEY: My question is being addressed to Undersecretary Cayanan. We know that the products of our research, development, and extension is not immediate. Its impact is also on the long-term productivity of our rice sector.

On one hand, production support services, like subsidies, have immediate impact. I observed that it is the government's way of bringing the technology to the doorsteps of farmers. But then, based on the presentation, these support services' impact over the long-run is not that huge, and can crowd-out research, development, and extension. So in your view, how do you find balance on the budget allocation of these instruments (RDE vs support services) in affecting the development of the rice industry?

ARIEL CAYANAN: Like for instance, other than PhilRice, we have IRRI here. You are the chairman of the board and all you have to do is to ask. Everything will be provided to you, and that is for implementation. The problem is, you know better than I do. When you request for a budget, you have already have a wish list, and since it comes from the word wish list, don't expect that it will be given to you. There will be prioritization. Despite the help of the private sectors that fosters our champions in increasing the project support, often we step out of the way. That is actually imposed to us. That's number one.

Number two, at the course of implementation I agree it is the farmers' choice. We are not Vietnam nor Myanmar that whatever the government dictates, will be done the next day. In the north, if you let farmers try a brand of input and they find it useless, they won't accept the product, definitely. But farmers would sell or consume these seeds, and they would buy the seeds that they prefer, not just the best ones. On the implementation side, you cannot simply impose because it is a free choice.

Sa norte, ibigay mo itong brand na ito. Pag hindi sila useful, they won't accept definitely. But *ibebenta* or *isasaing nila yung seedling na 'yun*. They will be using seedlings that they prefer not just the best one. So those are another things. On the implementation side, you could not simply impose because it's a freeware, it's a free choice.

Number three, I agree with Dr. Ponce. It is values formation. Values are some things that have been acquired for a long period of time. We cannot change it overnight. Otherwise, you are going to wipeout what we call human race, and develop a whole new generation, which is what we will not be doing, of course. There is what we call special prioritization in budgeting when it comes to support. We recognize that our main mandate is to produce food. That is why production support service is very important. Unfortunately, it can sometimes result in undesirable outcome, otherwise that would be a very solid marker. For the President, one thing is good. He takes many unpopular decisions, like the lowest calculated bid, which is not actually the bid that interests the government. That is actually opposing some of the previous policies that we have had. The challenge is to the other commission body, who will be guiding or looking at us. That is another thing also. One thing which is good about PhilRice and research institutions on production growth is that they are always coordinating. But whatever will be given to us, we will be managing it (the budget) the best way we can in order for us to meet at some point. What happens is before I project (the budget), sometimes, directions change, whether it's strategic or planned. Planned, meaning we have actually a very concrete plan, that's why the direction might change; or unplanned like all of a sudden somebody dies and then the direction suddenly changes.

All perspective, if not the whole, also changes. So those are the issues that we also have to face.

GELIA CASTILLO: What are the priorities of the new government in agriculture?

ARIEL CAYANAN: We have 10 strategies and priorities. I hope you can be very patient to listen about it one by one. Number one, is the color-coding map. What is that color-coding map? The soil suitability and fertility so that we will know what specific crop is suitable for what specific area. Also, what and how much of the inputs are we going to apply? Number two, I'll be mentioning only those that are very important. I'm not saying that the 10 are not important. Number 2, we are trying to measure the consumption, not of the whole country but rather of every area so that you will know the amount to produce for a specific area.

WORKSHOP OUTPUTS PER THEME

Issues/Contraints	Recommended Interventions	Persons/agencies/programs that will be involved
THEME: A. Rice research for development (R4D)		
1. Centralized research for development.	1.1. Conduct more site-specific researches 1.2. Strengthen manpower of PhilRice branch stations 1.3. Strengthen regional research centers 1.4. Participatory identification of problems	Department of Agriculture, Regional Research Centers, SUCs, PhilRice branch stations.
2. Fragmented R&D efforts in the regions	2.1 Increase complementation of R4D activities of PhilRice branch stations and regional research centers; encourage collaboration between PhilRice brach stations and research centers.	Department of Agriculture, Regional Research Centers, SUCs, PhilRice branch stations.
3. Low budgetary allocation	3.1. Lobby for increased budget.	Department of Agriculture, DBM, policymakers
4. Rice budgetary structure	4.1. The government could consider PhilRice as the lead rice R4D agency in the country. This implies that PhilRice will be in-charge of approving rice R4D projects even of other research institutions, and also manage the distribution of funds for rice R4D.	Department of Agriculture, PhilRice, other research institutions, DA-Bureau of Agricultural Research
5. Research centers and SUCs are included in rationalization	5.1. Exclude them from rationalization. They should not be treated as a corporation. Do not force them to make money because they are engaged in knowledge generation. Their research outputs, therefore, should be given for free.	Policymakers, Department of Agriculture, SUCs, research centers.
THEME: B. Marketing and trade		
1. QR Extension vs Tariffication	1.1. Prepare for tariffication	NEDA, DA
2. Low price during peak season	2.1. "Quedan" system; use cooperatives to hold the stock; provide cooperatives with storage facilities	Cooperatives/FOs, banks (for Quedan system), DA, private sector, NFA
3. Inefficient use of mechanical drying facility	3.1. Monitoring and sustain support; expand adoption of mechanical drying and other postharvest facilities	PhilMech, LGUs, Cooperatives/ FOs, DA, NFA
4. Overlapping functions of CDA and other government agencies (DA, DOST, DTI, etc.) in relation to cooperative assistance	4.1. Reformation of CDA; Transfer registration function to SEC	Congress, NEDA, PIDS, academe, DOF

Issues/Contraints	Recommended Interventions	Persons/agencies/programs that will be involved
5. Limited advocacy for grading and standardization	5.1. Impact evaluation to come up with a technical regulation (PNS).	NFA, Bureau of Agriculture and Fishery Standards, Cooperatives/FOs, grain industry stakeholders
6. Limited access to market information	6.1. Promote electronic trading system among grain industry players	DA, NFA, Cooperatives/FOs, grain industry players
7. Role of NFA in marketing	7.1. Policy review on NFA functions	NEDA, PIDS, academe, DOF
8. Lack of business acumen/ entrepreneurial skills among smallholders	8.1. Capacity-building for entrepreneurial skills	DA, LGUs, DTI, private sectors, academe, CSOs, NGOs
THEME: C. Rice extension system		
1. Fragmented extension system in Ph	1.1. develop an integrated national rice extension system; resubmit extension bill	ATI (lead), PhilRice, National Rice Program, DILG and LGU representatives, other R&D agencies
2. Low capacity of AEWs	2.1. AEWs should undergo capacity enhancement	ATI (lead), PhilRice, National Rice Program, DILG and LGU representatives, other R&D agencies
3. Low ratio of rice AEWs and farmers	3.1. Engage intermediaries (e.g. Farmer lead extension (FLE), LFTs, SCUs, private sectors); ensure critical mass of rice extension specialists; enhance technology adaptation; establishment of demo sites	ATI (lead), PhilRice, National Rice Program, DILG and LGU representatives, other R&D agencies
4. Weak linkage of RDE continuum	4.1. Strengthen linkage of RDE continuum	ATI (lead), PhilRice, National Rice Program, DILG and LGU representatives, other R&D agencies
5. Low budget allocation in extension system	5.1. Systematic budget allocation to extension	ATI (lead), PhilRice, National Rice Program, DILG and LGU representatives, other R&D agencies
THEME: D. Support services for farmers		
d.1. On production		
1. High-cost of fertilizers and Seeds	1.1. Liberalization of fertilizer importation; subsidy	
2. Limited access to public hybrid seeds	2.1. revisit production system of hybrid; localizing hybrid seed production	PhilRice; DA-OSEC; RFO; BPI
3. Limited supply to public hybrid seeds	3.1. revisit production system; localizing hybrid seed production	
4. Popularizing climate-resistant varieties	4.1. revisit production; localizing hybrid seed production	PhilRice; DA-OSEC; RFO; BPI

Issues/Contraints	Recommended Interventions	Persons/agencies/programs that will be involved
THEME: D. Support services for farmers		
D.1. On production		
5. Limited supply of climate-resistant varieties		PhilRice; DA-OSEC; RFO; BPI
6. limited SSIS in non-irrigated areas	6.1. higher budget	DA-RFO; BSWM
7. Limited soil analysis	7.1. mobile soil lab; infra support and capability building for soils laboratory and research center	BSWM; DA-RSL
D.2. On mechanization		
8. Lack of access to machines	8.1. Organized ownerships; establishing farm service centers;	DA-RFO; PhilMech, PhilRice, BAFE
9. Crop establishment		
10. combine-harvester		
11. post-harvest facilities (dryer)		
12. milling facilities		
13. labor displacement	13.1. selective intervention; capacity-building	
14. lack of quality control	14.1. develop guidelines	PhilMech, PhilRice, BAFE
15. lack of inter-agency coordination	15.1. develop guidelines	PCAF
D.3. On services		
16. limited information about crop insurance	16.1. information dissemination	PCIC
17. poor access to credit	17.1. additional fund for bigger coverage; capacitate to be credit-worthy; encourage banks to lend more;organize farmers	ACPC, LBP, GFI, ATI,CDA
18. high interest rate of credit	18.1. information dissemination; encourage banks and other conduits to lower their interest rates	ACPC, LBP, GFI
19. no health insurance of farmers		PhilHealth; DSWD
D.4. On marketing		
20. limited link to markets	20.1. guidelines to utilize Rice Processing Complex	PhilMech
21. Inadequate storage facilities	21.1. organized ownerships; establishing farm service centers	DA-RFO;

CLOSING REMARKS

Sailila E. Abdula

A pleasant afternoon to everyone.

Rice research for development (R4D) continues to upgrade its worth in the agriculture sector. Through its men and women, from private and public institutions, R4D has contributed in policymaking and in refining our agricultural agenda.

Today, we harnessed the significant findings and data resulting from years of productive R4D activities. We dissected the various sectors of the rice industry to come up with particular recommendations that we can endorse to the DA to help the new administration do its job much better.

With the four aspects of the rice industry that we have scrutinized today, I would like to identify certain points in our StratPlan that dovetail with some of the improvements that we would like to see implemented. This StratPlan is what we will carry out in the next six years, and will serve as performance barometer in R4D.

In terms of Marketing and Trade, **Outcomes 2 and 4** in our Strat Plan are our answers to the issues we are currently facing. By improving *postharvest machines*, *pre-milling and milling facilities*, *making systems and protocols* as well as *policy papers*, we can help change the rice trade and marketing system to help our farmers produce more and profit bigger. In order for us to make an impact on the lives of our farmers economically, we need to bridge them to our policymakers for them to better understand the farmers' dilemmas. To do this, we need to craft and submit policy papers in aid of supportive legislation.

For the Support Services for Farmers, **Outcome 6** in our Strat Plan is our response since it requires us to enhance partnerships and knowledge management for rice R4D. PhilRice recognizes that we cannot do it alone. We need to build *Partnerships* and conduct *Knowledge Sharing and Learning*. We have been partnering with various organizations in the past years i.e. IRRI, SUCs, other attached agencies of the DA. However, as challenges in rice production continue to escalate, we need to innovate and form linkages to optimize our capabilities.

For Rice Extension System, the need to evaluate and re-invent is critical to the changing needs of the farmers, extension workers, service providers, and other rice stakeholders. PhilRice is also rejuvenating its extension system, and sees the need to update old ways and ensure that new strategies fit the new needs of the farmers. To sustain our partnerships and linkages, we are continually tapping organizations and institutions to enhance our service. Needless to say, based on our StratPlan, we are geared and going toward the reforms that we need to execute. We acknowledge that there is still much to be considered and done.

I hope that our activity today reminded us not only of our role in helping steer the agriculture agenda of the country but also more importantly, our obligation in building a better future for the Filipino farmers. Thus, I would like to thank the Socioeconomics Division for initiating this fruitful workshop—I would like to mention Ms. Aileen Litonjua. To the participants, we hope that this seminar-workshop has helped you figure out your insights. Thank you for your participation and support in realizing the goal of this activity. My profound gratitude also goes to speakers, discussants, and moderators of this seminar-workshop for sharing their time and expertise in our goal to pave the way toward a rice-secure Philippines.

Maraming salamat po muli at mabuhay ang agrikulturang Pilipino!

APPENDICES

Appendix 1. List of Speakers and Discussants

Theme	Speakers	Discussants
Rice research for development	Mr. Raymond Patrick L. Cabrera (Technical Staff, Bureau of Agricultural Research)	Dr. Flordeliza H. Bordey (Deputy Executive Director for Development, PhilRice)
Marketing and trade	Dr. Roehlano M. Briones (Senior Research Fellow, Philippine Institute for Development Studies)	Dr. Isabelita M. Pabuayon (Dean, University of the Philippines at Los Baños)
Rice extension system	Dr. Eliseo R. Ponce (Former Professor of Research and Extension Management, Visayas State University)	Engr. Renato B. dela Cruz (OIC-Director, Agricultural Training Institute)
Support services for farmers	Mr. Nomer C. Esmero (Senior National Coordinator, Better Rice Initiative Asia)	Engr. Ariel T. Cayanan (Undersecretary for Operations, Department of Agriculture)

Appendix 2. Program of Activities

8:00-8:15	**Registration**	
8:16-8:30	**Opening Program**	
	Invocation	**Perry Irish H. Duran**
	National Anthem	video presentation
	Opening Remarks	**Dr. Eduardo Jimmy P. Quilang** *Acting DED for Research, PhilRice*
8:31-9:00	Launching of the Book, *Competitiveness of Philippine Rice in Asia* **Dr. Flordeliza H. Bordey** *Acting DED for Development, PhilRice*	
9:00-9:50	**Research for Development (R4D)**	
	Speaker	**Mr. Raymond Patrick L. Cabrera** *Technical Staff, Bureau of Agricultural Research*
	Discussant	**Dr. Flordeliza H. Bordey** *Acting DED for Development, PhilRice*
9:51-10:41	**Marketing and Trade**	
	Speaker	**Dr. Roehlano M. Briones** *Senior Research Fellow, PIDS*
	Discussant	**Dr. Isabelita M. Pabuayon** *University of the Philippines Los Baños*
10:42-11:32	**Rice Extension System**	
	Speaker	**Dr. Eliseo R. Ponce** *Former Professor of Research and Extension Management, VSU*
	Discussant	**Engr. Renato B. Dela Cruz** *OIC-Director, ATI*
11:33-12:23	**Support Services for Farmers**	
	Speaker	**Mr. Nomer C. Esmero** *Sr. National Coordinator, BRIA*
	Discussant	**Engr. Ariel T. Cayanan** *Executive Director, PCAF*
12:24-1:29	**Lunch Break**	
1:30-2:30	**Breakaway sessions (workshop)**	
	Moderators:	
	Research for Development (R4D)	Ms. Aileen C. Litonjua
	Marketing and Trade	Dr. Jesusa C. Beltran
	Rice Extension System	Ms. Rhemilyn Z. Relado
	Support Services for Farmers	Mr. Ronell B. Malasa
2:31-3:31	**Presentation of workshop outputs per theme**	
3:32-4:00	**Closing Remarks**	**Dr. Sailila E. Abdula** *Acting Executive Director, PhilRice*
	Dr. Ronan G. Zagado *Master of Ceremonies*	

Appendix 3. List of Participants

Name	Agency/Office/Affiliation
Ezrael L. Manzano	Agricultural Credit Policy Council
Kennedy A. Garabiag	Agricultural Credit Policy Council
Dr. Edna D. Samar	Bureau of Soils and Water Management
Sonia M. Salguero	Bureau of Soils and Water Management
Randolph T. Barker	Cornell University
Edmar Fajutagana	DA - AMAS
Rex L. Navarro	External Performance Management Review
Dr. Fernando A. Bernardo	External Performance Management Review
Jose T. Panganiban Jr. (representative)	House of Representatives (Committee on Agriculture and (Food)
Piedad P. Moya	International Rice Research Institute
Ma. Shiela D. Valencia	International Rice Research Institute
Mary Rose San Valentin	International Rice Research Institute
Lenard Martin P. Guevarra	National Economic and Development Authority (NEDA)
Rosalyn D. Comia	National Food Authority
Victoriano Sto Tomas	National Food Authority
Noemi Morfe	National Food Authority
Rosalina P. Dela Cruz	National Irrigation Adminstration
Dr. Santiago R. Obien	National Rice Program
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Renita dela Cruz	Philippine Center for Postharvest Development and Mechanization (PHilMech)
Estrella V. Tulay	Philippine Council for Agriculture and Fisheries
Catherine A. Viray	Philippine Council for Agriculture and Fisheries
Jose Reden H. Besenio	Philippine Council for Agriculture and Fisheries
Genny G. Bandoles	Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)
Jennifer C. Puntanar	Philippine Council for Agriculture, Forestry and Natural Resources Research and Development (PCARRD)
Rosalie Bernido	Philippine Crop Insurance Corporation
Peter S. Turingan	Senate Economic Planning office
Dr. Eliseo R. Ponce	Visayas State University
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We are a government corporate entity (Classification E) under the Department of Agriculture. We were created through Executive Order 1061 on 5 November 1985 (as amended) to help develop high-yielding and cost-reducing technologies so farmers can produce enough rice for all Filipinos.

With our "Rice-Secure Philippines" vision, we want the Filipino rice farmers and the Philippine rice industry to be competitive through research for development work in our central and seven branch stations, coordinating with a network that comprises 59 agencies strategically located nationwide.

We have the following certifications: ISO 9001:2008 (Quality Management), ISO 14001:2004 (Environmental Management), and OHSAS 18001:2007 (Occupational Health and Safety Assessment Series).

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