The Philippine Rice Industry Roadmap 2030

"Toward a rice-secure Philippines"

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Foreword

The marching challenge to provide Filipinos with ***matatag, maginhawa, at panatag na buhay*** sparks a new outlook in food production. For rice, our staple food, it means availability, accessibility, and affordability of safe and nutritious rice at all times. Hence, our goal – rice security.

The path towards that desired destination is admittedly daring yet inspiring. It requires an out-of-the-box mindset to explore means of conquering the challenges and turning them into opportunities to make the rice industry and the Filipino farmers competitive, profitable, resilient, and sustainable.

Improving competitiveness is the way forward. We have to produce more with less. The Philippine Rice Industry Roadmap (PRIR) 2030 will draw and light that way. It highlights the rice sector's strategic plan and corresponding interventions to address the gaps that continuously burden the rice value chain from production to marketing and consumption.

Scrutinizing historical and emerging trends, interventions will focus on provinces with great potential to enhance competitiveness. But no one should be left behind. Thus, the support to improve farm diversification in other provinces is also in place.

The roadmap will guide the crafting of localized operational plans in the regional and provincial levels with the help of our partners in the field. Together, we will implement key strategies particularly on increasing yield, reducing cost, enhancing resiliency, and ensuring safety and nutrition.

No plan is cast on stone. This document is the first edition of the PRIR 2030 as we are opening avenues for improvement when the changing time demands for it. Beyond focusing at the present, the roadmap backtracks learning experiences and transcends boundaries of time and individual interests. It positions a long-term plan with mid-term milestones for the rice industry, prioritizing the aspirations of the Filipino people.

With the realization of the PRIR 2030, we claim a rice-secure Philippines.

EMMANUEL F. PIÑOL
Secretary of Agriculture

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The Philippine Rice Industry Roadmap 2030

1. Introduction

The Philippine Rice Industry Roadmap (PRIR) 2030 is conceptualized to contribute toward attaining the ***Ambisyon Natin 2040*** – the long-term shared life goal of Filipinos of having ***Matatag, Maginhawa, at Panatag na Buhay***. The PRIR 2030 supports the Philippine Development Plan goals of laying down the foundation for inclusive growth, a high-trust and smart society, and a globally competitive knowledge economy. It upholds achieving a rice-secure Philippines as a necessary foundation toward this goal.

Current Scenario

Constant changes in the global sociocultural, environmental, and political landscape continuously challenge the world's food security. Ballooning population, rising standards of living, climate change, and water scarcity are among the major contributing factors. These challenges are even more pronounced in the Philippines, especially in the face of trade liberalization.

With the bouts and uncertainties surrounding the rice industry, the government has continuously assured the public that ways are being crafted to cushion the country from the potential effects of opening the local market to products and services from abroad.

Rice, as the country's staple food, is especially precarious and controversial. While the state intends to institutionalize policies supporting rice farmers, it also has to abide by its commitment to the World Trade Organization, specifically the ASEAN Free Trade Agreement. Putting tariff instead of quantitative restrictions is now at the center of discussions.

The Food and Agriculture Organization reported around 106.5 million Filipinos in 2018 with each person consuming 110 kg of rice every year (PSA, 2018). The rising standards of living extends the people's demand from ensuring food security to also sustaining the environment. In addition, rapid urbanization has led 45.3% of the population in 2010 to move in urban areas, resulting in changes in the demand pattern.

Amidst population growth, climate change and water scarcity are evidently damaging our food production systems. The El Nino phenomenon in 2016 resulted in P727 million in production damages and losses due to drought. In recent years, heavy and prolonged monsoon rains worsen the decline in crop yields caused by the more than 20 typhoons visiting the country each year. The southwest monsoon in July 2018 enhanced by three typhoons cost the agriculture sector with roughly P897 million worth of losses in seven regions (NDRRMC, 2018).

The Philippines resorts to importing rice to address the supply and demand gap especially during lean seasons. Area harvested is also relatively small at 4.81 million hectares compared to our counterparts in Southeast Asia.

Comparing the competitiveness of Philippine rice in Asia showed that our local farmers in Nueva Ecija spend around P12.41 to produce a kilogram of rice (Moya et al., 2016a). This is high compared to the cost of our neighboring countries such as Vietnam (represented by Can Tho province) at P6.53/kg and Thailand (represented by Suphanburi province) at P8.85/kg (Table 1). The same irrigated and intensively cultivated rice areas produce lesser at 9.52 t/ha/annum than the former's 10.47 t/ha/annum and the latter's 20.59t/ha/annum (Bordey et al., 2016).

Nonetheless, Filipino farmers who own their land and capital, and use their family labor have lower paid-out cost. In the previous analysis (Table 1), although the full cost is P12.41/kg, the paid-out cost is only P9.21/kg. At the farmgate price of P17.19, a typical Filipino rice farmer will have a net profit of roughly P5/kg, which is the returns to his management. If the returns to his own land, labor, and capital are considered, he actually receives an income of almost P8/kg of produced paddy, which is the net above paid-out cost (Moya et al., 2016b)

Table 1. Comparative cost of rice production

Costs (P/kg)	Philippines	Thailand	Vietnam
Seed	0.58	1.12	0.44
Fertilizer	1.94	1.56	1.36
Pesticide	0.36	0.90	0.87
Hired Labor	3.76	0.66	0.46
Operator, Family, & Exchange Labor	0.66	0.65	0.81
Animal, Machine, Fuel & Oil	1.73	1.66	0.81
Irrigation	0.45	0.14	0.08
Land Rent	2.11	1.89	1.49
Interest on Capital	0.43	0.07	0.08
Others	0.40	0.20	0.13
Total Cost/kg	**12.41**	**8.85**	**6.53**
Paid-out Cost/kg	**9.21**	**6.24**	**4.15**
Farmgate Price (14% MC)	**17.19**	**14.09**	**9.64**
Net Profit	**4.78**	**5.24**	**3.11**
Net Above Paid-out Cost	**7.98**	**7.85**	**5.49**

Source: Moya et al., 2016

Based on the average of 2013, 2014, and 2017 data[1], 29 provinces produce rice at above 4t/ha, at par with the current national average of 4.01 t/ha; 39 provinces at 3-4 t/ha; and 14 provinces at less than 3t/ha. In terms of cost, 34 provinces spend less than P12/kg; 44 provinces have production cost from P12-17/kg; and 4 provinces with more than P17/kg.

Hired labor, land rent, and fertilizer accounted for the high production cost in the Philippines in comparison with Vietnam and Thailand. However, it was noted that investments would be best efficient in reducing hired labor and improving farm mechanization (Table 1).

[1] 2015 and 2016 were excluded because of the abnormal effects of El Niño to rice production.

Postproduction is also an issue. The current practices incur as much as 14.29% grain losses from harvesting to storage (Table 2).

Table 2. Postproduction losses

Postharvest Operation	% Average Loss	% Share
Harvesting, piling, and threshing	4.29%	30
Drying	3.86%	27
Milling	5.52%	39
Storage	0.62%	4
TOTAL	**14.29%**	**100**

Source: PhilRice and PHilMech, 2016

At the marketing level, major cost items are drying, transport, milling, storage, packaging, and working capital. High transport and milling costs, compared to Vietnam and Thailand, account for greater share in processing cost. Better road conditions in the two countries allow use of bigger trucks to transport rice, leading to transport cost efficiency.

The limited supply of paddy rice hinders rice mills in the Philippines from operating at a full capacity. Hence, also contributing to higher milling cost. Rice mills in the country operate only at 8 hours/day in off-peak months and as much as 16 hours in peak season. Those in Thailand and Vietnam can operate for 24 hours.

Table 3. Marketing cost

Item	Philippines	Thailand	Vietnam
Total marketing cost	**4.63**	**2.73**	**3.78**
Drying cost	0.26	0.33	0.52
Transport cost	2.09	1.08	1.76
Milling cost	1.38	0.89	0.93
Storage cost	0.19	0.20	0.23
Packaging cost	0.45	0.14	0.22
Cost of working capital	0.27	0.09	0.11
Returns above major cost	4.43	2.54	0.77
Gross marketing margins	9.06	5.27	4.55

Source: Beltran et al., 2016

The above scenarios inevitably pose an array of challenges for the Philippine rice industry, particularly among the Filipino rice farmers. Improving their competitiveness and the sector as a whole is the way forward. Competitiveness means the ability of a producer to produce goods that have superior or same quality at lower costs than its competitor. However, it does not rest on production alone. Processing and marketing cost also matter. The uncertainty brought about by climate change makes the task of improving competitiveness doubly difficult. Furthermore, the changing lifestyle and consciousness of people creates an emerging demand for quality food. The real challenge lies on addressing the evolving requirements as we enter a new era of rice cultivation, commerce, and consumption.

Future Scenario

From quantitative restriction, which gives the government the power to set the volume of rice that will be imported, the Philippines is now transitioning toward a tariff regime. Under this, the government will impose tariff on rice imports, which aligns our domestic rice trade policies to our obligations to the WTO and makes our rice trade more transparent. This shift in rice trade policy implies narrowing the difference in rice prices between the world and domestic markets. When the world price is initially lower than domestic price, the latter is expected to decline, which is the current scenario in 2018.

The Philippines has committed to apply 35% tariff under the ASEAN Trade in Goods Agreement (ATIGA) in support of the ASEAN Economic Integration. Since more than 90% of Philippine rice imports originate from its Southeast Asian neighbors, the PRIR 2030 assumes this applied tariff rate in projecting the impact of the abovementioned policy shift. Based on this, a kilogram of 25% broken rice from Vietnam or Thailand can be sold in Metro Manila wholesale markets at around P35/kg (Box 1).

Box 1. Estimated import parity price of imported rice from Vietnam and Thailand (25% broken), January-June 2018.

Item	Average	Average (P/kg)
FOB Price of 25% broken (US$/t)[1]	415.08	21.56
+ Freight Cost (US$/t)[2]	32.50	1.69
+ Surveyor's Fee (US$/t)[3]	1.00	0.05
+ Insurance Cost (US$/t)[4]	5.00	0.26
+ Integrated Cargo Handling Costs (US$/t)[5]	30.00	1.56
Landed Cost of Imported Rice (US$/t)	483.58	
Peso-Dollar Official Exchange Rate (P)[6]	51.95	
Cost of commodity, freight, and insurance (P/t)	25,122.12	25.12
+ Tariff Payment (P/t)[7]	8,792.74	8.79
CIF + tariff payments (P/t)	**33,914.86**	**33.91**
+ estimated transport cost (P/t)[8]	1,395.65	1.40
Import Parity Price/Price at the Wholesale Market (PhP per MT)	**35,310.51**	**35.31**

[1]Free on Board (FOB) is Jan-Jun 2018 Average Price of Rice (25% Broken), from FAO - the value of the goods free on board the carrier at the frontier of the exporting country

[2]Freight Cost is from NFA which was used in the May 22, 2018 Government-to-Private Tender - transportation cost from the exporting country to the Philippines

[3]Surveyor's Fee is from NFA which was used in the May 22, 2018 Government-to-Private Tender - is the fee paid for the inspection of the quality and quantity of imported rice, whether it is within the specification written in the contract, at the port of exporting country

[4]Insurance Cost is from NFA which was used in the May 22, 2018 Government-to-Private Tender - includes the cost of insurance from warehouse of origin to port of loading, marine insurance, and insurance from port of discharge up to stockpile of NFA designated warehouses

[5]Integrated Cargo Handling is from NFA which was used in the May 22, 2018 Government-to-Private Tender - is the cost for unloading from ship to port, and delivery from port to warehouse

[6]Jan-Jun 2018 average exchange rate from BSP

[7]Tariff rate is 35% which is the one prescribed by the ASEAN Trade in Goods Agreement (ATIGA)

[8]Transport cost is based on 2013 Transport Cost from PhilRice Benchmarking Study, inflated to Jan-Jun 2018 price based on CPI from PSA - is the average transportation cost from warehouse to market.

A cheaper milled rice in the domestic market has effects on both production and consumption. The wholesale price of P35/kg is expected to translate into lower farmgate price. At this level, the estimated farmgate price will be P16.94/kg. This shows that farmers with production cost lower than this price will still gain profit. However, only those who have production cost lower than P11.94/kg can maintain the average profit level of farmers at P5/kg (Box 2). Conversely, farmers who produce rice at cost higher than P16.94/kg are at risk of incurring losses and may discontinue producing rice in the future.

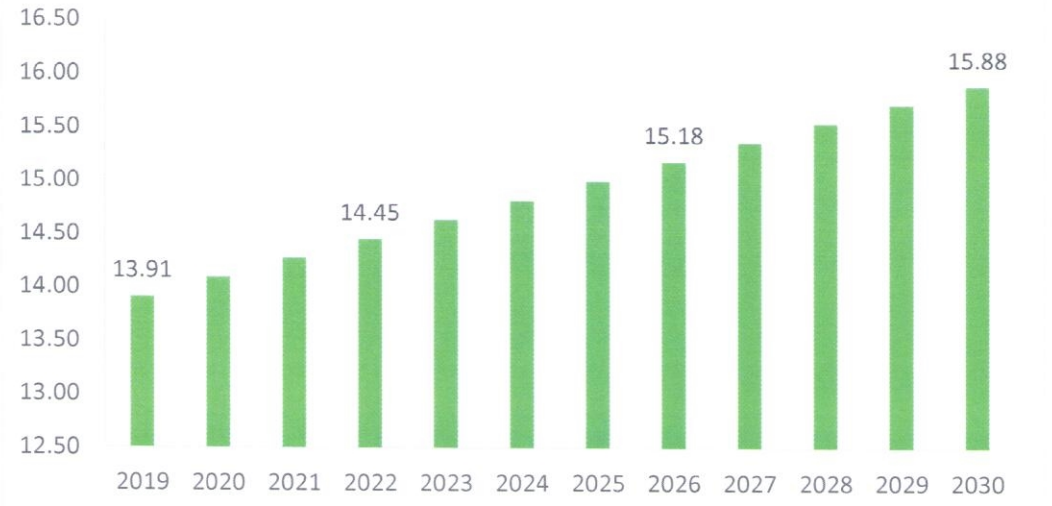
Box 2. Effect of 35% tariff on imported rice to farmgate price.

Item	Value (P/kg)
Import Parity Price/Price at the Wholesale Market	35.31
- Total Marketing Cost[1]	5.25
- Traders Income[2]	4.00
= Cost of Milled Rice	26.07
x Milling Ratio	0.65
= Price of Palay	**16.94**
- Farmers profit of PhP 5.00 per kg[3]	5.00
= Production cost	**11.94**

[1] Marketing cost is based on Competitiveness of Philippine Rice in Asia
[2]Traders profit is based on Competitiveness of Philippine Rice in Asia, which is P4.43/kg.
[3]Based on Competitiveness of Philippine Rice in Asia's estimated farmers' profit is P4.80/kg.

Given the 2018 domestic wholesale price of around P40/kg, the reduction to P35/kg will encourage consumption of more rice[2]. Thus, the annual per capita rice consumption is expected to increase from 110 to 114kg. Assuming no further increase in other uses of rice, the total rice use is projected to increase from 13.91 M tons in 2019 to 15.88 M tons in 2030 (Figure 1).

Figure 1. Projected total use (in milled rice equivalent, M tons)



[2] This assumes a price elasticity of rice demand of -0.3% (Briones and Tolin, 2016).

This projection precludes other factors that can affect consumption. Rise in per capita income may initially result in higher expenditure in food, including rice. However, experiences in other countries showed that further increase in income also triggers shift in diet from food high in carbohydrates to those rich in protein, vitamins, and minerals. With higher income level, consumers also prioritize food quality and nutritional value over quantity. The interplay among these factors will affect the future of rice supply and demand in the Philippines.

2. Vision and Mission

The industry vision is a rice-secure Philippines. It is anchored on the societal goal, ***availability and affordability of food for all Filipinos***. For rice, it means availability, affordability, and accessibility of high-quality and nutritious rice at all times. It encompasses broad areas relating to rice cultivation, commerce, consumption, and competitiveness. The most sustainable pathway to realizing rice security is producing sufficient rice at a competitive cost.

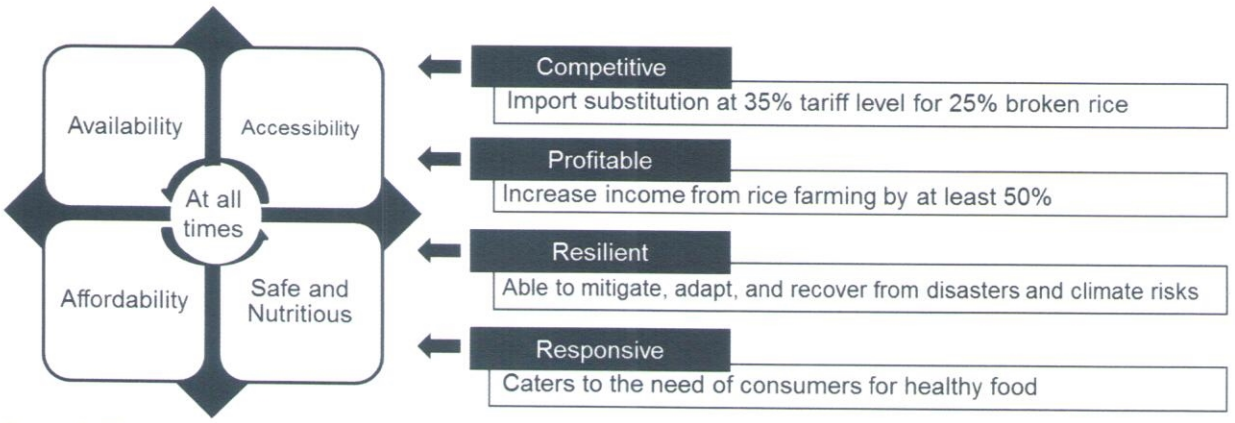


Figure 2. The PRIR vision and mission framework

Toward this vision, the roadmap is centered on achieving a competitive, profitable, resilient, and responsive rice industry. The industry is competitive if the wholesale price of domestic rice can compete with imported rice at 35% tariff level. It is profitable if the net income from rice farming can increase by at least 50%[3]. It is resilient if it can adapt and recover from disasters and climate risks. A responsive industry should be able to cater to consumer demands for safe and healthy rice (Figure 2).

3. Goals

The PRIR 2030 ultimately aims to achieve three major targets: 1) improved competitiveness; 2) enhanced resiliency to disasters and climate risks; and 3) ensured access to safe and nutritious rice.

To focus strategic interventions while maintaining the core support to all targets, the timeframe for the objectives is subdivided into three phases: Phase 1 will focus on target 1

[3] At a farmgate price of P17/kg and cost of P12/kg, a farmer generally earns P5/kg, which when multiplied to an average yield of 4t/ha gives a profit of P20,000/season.

for 2017-2022; Phase 2 will cater to target 2 for 2023-2026; and Phase 3 will center on target 3 for 2027-2030.

4. Strategic Targets and Interventions

To ensure efficiency of public investment, 57 priority provinces are identified based on criteria covering yield, area harvested, cost of production, and percentage of irrigated area harvested. Except for Maguindanao, Lanao del Sur, and Western Samar, all provinces under high priority category have medium to high yield (above 3t/ha). Their production costs are also less than P16.94/kg, which is the breakeven farmgate price under the trade liberalization scenario with 35% tariff. The high priority provinces are sub-categorized in Table 4.

Table 4. Categorization of provinces

	High Yield (> 4 tons/ha)	**Medium Yield (3-4 tons/ha)***
Low Cost (<P12/kg)	Nueva Ecija, Isabela, Bukidnon, Zamboanga del Sur, Pampanga, Misamis Occidental, Lanao del Norte, Biliran, Bataan, Aurora, Kalinga	Camarines Sur, South Cotabato, Leyte, Negros Occidental, Iloilo, Capiz, Albay, Maguindanao, Agusan del Norte, Antique, Sorsogon Masbate, Palawan, Cavite, Lanao del Sur, Western Samar, Surigao del Sur, Aklan
Medium Cost (P12-17/kg)	North Cotabato, Tarlac, Cagayan, Pangasinan, Bulacan, Nueva Vizcaya, Ilocos Norte, Davao Oriental, Davao del Sur, Davao del Norte, Southern Leyte, Laguna, Zambales, Quirino, Misamis Oriental, Zamboanga Sibugay, La Union, Ilocos Sur	Compostella Valley, Negros Oriental, Bohol, Occidental Mindoro, Quezon, Ifugao

Box 3. Criteria for selecting priority provinces.

Rice is produced in 80 provinces and two highly urbanized cities in the Philippines. All these administrative locations are considered in the prioritization process. Using data on years 2013, 2014, and 2017 (2015-2016 are excluded because of the effect of El Nino phenomenon on production), the provinces are prioritized according to the following criteria and are scored accordingly:

Area Harvested	Scores
< =10000 ha	1
>10000 to <=50000	2
>50000 to <=100000	3
>100000	4
Yield	
<=3 t/ha	1
>3 to <=4 t/ha	2
> 4 t/ha	3
% of Irrigated to Total Area	
<= the national average of 68%	1
> the national average of 68%	2
Unit Cost of Production	
>16.94 P/kg	1
11.94 to 16.94 P/kg	2
<11.94 P/kg	3

Thus, the maximum score that a province can get is 12 while the minimum is 4. Given this, all provinces with a score of at least 8 points are considered part of high priority provinces and those with score of at most 7 points are deemed low priority provinces.

4.1. Improved Competitiveness

To enable the local rice to compete with imports, the Filipino farmers must narrow yield gaps and reduce production costs from their current levels. Priority provinces will be the focus of interventions spread across the rice value chain, including marketing. For the other provinces, transition interventions from rice to other sources of income will be introduced. Realization of these targets will contribute in increasing farm income in the priority provinces. On other hand, farmers in other provinces will still be supported in terms of farm diversification and skills training.

- Increase average yield to 6 t/ha in high-yield provinces and 5t/ha in medium-yield provinces;
- Reduce average farm production cost to P8/kg in low-cost provinces and P10/kg in medium-cost provinces;
- Reduce average postharvest losses to 12% of harvest in provinces with deficit in drying capacity;
- Reduce average marketing cost by P1/kg; and
- Assist transition of rice farmers and farm workers in low-priority provinces

Table 5. Strategic target, intervention, and core support for improved competitiveness

Strategic Target	Strategic Intervention	Core Support
Increase average yield to 6t/ha in high-yield provinces and 5t/ha in medium-yield provinces	• Hybrid seed support to high-yield provinces • Inbred seed support to high- and medium-yield provinces	• Irrigation development in medium-yield provinces with percent irrigated area harvested less than the national average (See Box 4 for target provinces) • Extension support in all target provinces (technology demonstration, training, IEC materials, ICT platforms, advisory services) • R&D on yield-enhancing integrated crop management • Facilitation of access to credit for farmers
Reduce average farm production cost to P8/kg in low-cost provinces and P10/kg in medium-cost provinces	• Mechanization support (focused on intensified use of combine harvester in 2019-2020, other machines in 2021 and beyond) • Promotion of cost-saving package of technologies in 2021 and beyond (e.g. direct-seeding)	• Competency-based training on farm machinery operation and basic maintenance • Development of the local farm machinery manufacturing industry • Facilitation of access to credit for custom service providers • Development of an ICT platform for easy access to custom service providers • R&D on mechanized rice farming (localized machines, optimized model of mechanized farm)
Reduce average postharvest losses to 12% of harvest in provinces with deficit in drying capacity	• Upgrading of drying facilities in capacity-deficit provinces (See Box 5 for target provinces)	• Competency-based training on drying operation and basic maintenance • Facilitation of access to credit for custom service providers • R&D on bulk drying system
Reduce average marketing cost by P1/kg		• Improvement of farm-to-market roads and support to development of railway systems (See Box 6B and 6D for target provinces) • Capacity building on improving farmers' business skills and lessening market layers • Piloting of palay wholesale market services (with weighing and MC measurement, drying and temporary storage) in high-yield provinces
Assist transition of rice farmers and farm workers in low-priority provinces	• Provide income support to rice farmers while undergoing training	• Training on farm diversification for farmers • Training on non-rice agriculture for farm workers with potential collaboration with TESDA

Box 4. Target provinces for irrigation development

Province	Yield (t/ha)	% Irrigated area harvested
Leyte	3.96	64.21
Negros Occidental	3.85	67.06
Iloilo	3.25	42.74
Capiz	3.20	28.63
Antique	3.51	56.93
Masbate	3.02	25.97
Palawan	3.54	54.80
Surigao del Sur	3.19	65.10
Agusan del Sur	3.27	44.38
Bohol	3.30	50.09
Aklan	3.18	48.81
Occidental Mindoro	3.99	66.63
Quezon	3.14	53.4

These provinces are included in the priority provinces. However, irrigation development is identified as a yield-increasing strategy only in provinces with medium yield with percentage of irrigated area harvested lower than national average of 68%.

Box 5. Target provinces for upgrading drying facilities

Capacity	Drying
Surplus	**Intervention: access to credit window for drying facilities** *Ifugao, Ilocos Sur, Isabela, Nueva Vizcaya, Quirino, Negros Oriental, Bukidnon, Misamis Oriental, Compostella Valley, Davao del Norte, Davao del Sur, Davao Oriental, North Cotabato, Saranggani, South Cotabato, Agusan del Norte, Agusan del Sur*
Medium Deficit	**Intervention: provision of support to improve NFA drying facilities** *Kalinga, Ilocos Norte, La Union, Pangasinan, Cagayan, Aurora, Bulacan, Nueva Ecija, Pampanga, Zambales, Laguna, Quezon, Occidental Mindoro, Oriental Mindoro, Palawan, Albay, Camarines Sur, Sorsogon, Aklan, Iloilo, Bohol, Samar, Southern Leyte, Zamboanga Sibugay, Zamboanga del Sur, Lanao del Norte, Sultan Kudarat, Surigao del Sur*
Highly Deficit	**Intervention: provision of drying facilities to farm organizations trained on operation and basic maintenance** *Bataan, Tarlac, Masbate, Antique, Capiz, Negros Occidental, Biliran, Leyte, Misamis Occidental, Lanao del Sur, Maguindanao*

These provinces are included in the priority provinces but where the capacity of existing dryers is lower than its paddy production capacity. A province is categorized as surplus if the ratio of its drying capacity to its palay production is 1.0 or more; medium deficit if the ratio is between 0.5 and 1.0; and highly deficit if the ratio is less than 0.5.

On top of the core budget, additional funds will be tapped from the Rice Competitiveness Enhancement Fund derived from tariff revenues to support the implementation of strategic interventions. Initial funds that may be provided through the enactment of rice tariffication law can be also tapped. Additional support is necessary to address the urgency of improving the competitiveness and mitigate the ill effects of trade liberalization on rice producers.

Box 6. Rice sufficiency status and proximity to market

Rice sufficiency	Proximity to port where imported rice is disembarked	
	Near	**Far**
Surplus	**(6A)** **Intervention: priority areas for palay procurement** Zamboanga del Sur, Occidental Mindoro, Oriental Mindoro, Sultan Kudarat, Tarlac, Bukidnon, Iloilo, Capiz, Antique, Zamboanga Sibugay, South Cotabato, Pangasinan, Zamboanga del Norte, Camarines Sur, Ilocos Sur, Guimaras, Lanao del Norte, Davao del Sur, Compostela Valley	**(6B)** **Intervention: transportation development (e.g. FMR, road widening, and railway system)** Nueva Ecija, Cagayan, Isabela, Apayao, Kalinga, Nueva Vizcaya, Ilocos Norte, Quirino, Aurora, North Cotabato, Agusan del Sur, Biliran, Palawan, Abra, Leyte, Maguindanao, Ifugao
Marginally Sufficient	**(6C)** **Intervention: priority areas for palay procurement** Agusan del Norte, La Union, Pampanga, Bataan, Aklan, Zambales, Negros Occidental, Sorsogon, Bohol	**(6D)** **Intervention: transportation development (e.g. FMR, road widening, and railway system)** Camarines Norte
Deficit	**(6E)** **Interventions: port decongestion or truck ban exemption** Davao Oriental, Masbate, Catanduanes, Albay, Zamboanga City, Surigao del Sur, Bulacan, Davao del Norte, Surigao del Norte, Quezon, Sarangani, Negros Oriental, Dinagat Islands, Laguna, Siquijor, Misamis Oriental, Camiguin, Batangas, Rizal, Cavite, Davao City, Cebu	**(6F)** **Intervention: priority areas for releasing buffer stock** Samar (Western Samar), Northern Samar, Southern Leyte, Eastern Samar, Misamis Occidental, Lanao del Sur, Romblon, Marinduque, Mountain Province, Benguet, Batanes, Sulu, Tawi-Tawi, Basilan

The rice sufficiency status of a province was estimated based on its production in 2017 and its rice consumption as food. Average per capita consumption was multiplied by the population per province. A surplus province has a production to consumption ratio of more than 1.25; marginally sufficient if the ratio is between 1 and 1.25; and deficit with a ratio less than 1.

4.2. Enhanced Resiliency to Disasters and Climate Risks

Strong typhoons, destructive floods, and drought impact heavily on agriculture and fisheries every year. These hydro-meteorological events, coupled with land and water degradation, challenge agricultural production, and strain the lives of farmers. The impacts are expected to be more severe with rising global temperature, sea level rise, more intense rainfall events and (thus more floods and landslides), longer dry spells, and stronger monsoon rainfall variability.

Hence, by 2026, farm adaptability to disasters and climate risks should be increased, looking into the following specific objectives:

- At least 60% of rice farms covered by crop insurance

- 100% of rice farmers adopting climate-resilient technologies; and
- 100% of rice farms affected by calamities provided with seeds for quick-turn-around

Table 7. Strategic target, intervention, and core support for enhanced resiliency to disasters and climate risks

Strategic Target	Strategic Intervention	Core Support
At least 60% of rice farms covered by crop insurance	• Provision of crop insurance support in all target provinces from 2023-2026	• Provision of crop insurance support in high-risk provinces from 2019-2022
100% of rice farmers adopting climate-resilient technologies		• Use of climate risk vulnerability map to focus adaptation strategies • Extension support on localized climate information service, dynamic cropping calendar, and climate-resilient technologies • R&D on climate-resilient production and postproduction technologies
100% of rice farms affected by calamities provided with seeds for quick-turn-around		• Increase seed reserves to cover expected areas to be affected by climate change

4.3. Ensured access to safe and nutritious rice

Rice security is a function of both production and consumption. While there are strides to improve our productivity to boost our production, there must also be initiatives to manage the consumption of Filipinos. Otherwise, the effort to maximize yield would not have much impact. The emerging demand for food consumption may also pressure the country's production system to add value to rice as staple food. On top of enough and affordable supply, people are starting to require access to quality and healthy rice.

The following objectives will contribute to ensuring access to safe and nutritious rice:

- Maintain in strategic locations rice buffer stock for at least 15 days at any given time; 30 days by July 1st of every year;
- Increase availability of value-added rice and its products; and
- Promote responsible rice utilization to reduce wastage

Table 8. Strategic target, intervention, and core support for ensured access to safe and nutritious rice

Strategic Target	Core Support
Maintain in strategic locations rice buffer stock for at least 15 days at any given time; 30 days by July 1st of every year	• Government palay procurement in focus provinces and rice importation (if needed) for buffer stock program (See Box 6A and 6C for target provinces) • Strategic distribution of stocks particularly in supply-deficit provinces (See Box 6F for target provinces) • Port decongestion in supply-deficit provinces near disembarkation port of imported rice (See Box 6E for target provinces)
Increase availability of value-added rice and its products	• R&D on value-adding and improving rice quality • Capacity enhancement for farmers on value-adding mechanisms/processes including marketing of products
Promote responsible rice utilization to reduce wastage	• Awareness and advocacy campaigns on reduction of rice wastage

5. Policy and Regulatory Support

The following legislative agenda are key requirements to achieve the goals of the PRIR 2030.

- Legislate the Rice Industry Development Act to ensure funding of the PRIR 2030.
- Revisit the Seed Industry Development Act.
- Support the Comprehensive Land Use Plan.
- Harmonize the Philippine Grain Standardization Program.
- Institutionalize a rice buffer stock mechanism.
- Converge initiatives among concerned government agencies on management of water resources.

6. Program Management

The PRIR 2030 will be supported by **regional operational plans with provincial components** to be developed in consultation with stakeholders. Program implementation will be supported with monitoring and evaluation, advocacy and information dissemination, capacity building for implementers, operations management, and enhancement of infrastructure and equipment for management.

6.1. Roles of Key Implementers

Secretary of Agriculture

- Provides overall leadership in the implementation of the Philippine Rice Industry Roadmap 2030 (PRIR 2030);
- Provides policy directions;
- Ensures the availability of the required budgets;
- Serves as Chairperson of the National Steering Committee; and
- Approves detailed operational plan of the PRIR 2030.

DA Undersecretary for Operations

- Provides operational and administrative leadership in the implementation of the PRIR 2030;
- Ensures that required budgets are released on time;
- Ensures that the targets are met;
- Mobilizes the DA bureaus and attached agencies to support the PRIR 2030;
- Conducts periodic and on-the-spot assessment on the progress of the implementation of the program;
- Serves as co-chairperson of the National Steering Committee;
- Provides the necessary manpower and facilities/equipment for program coordination; and
- Serves as the National Rice Program Coordinator, with the following functions:
    - Serves as the Chairperson of the National Technical Working Group for Rice and head of the National Program Secretariat for Rice;
    - Prepares the detailed implementation of the rice program;

- Prepares the timetable for rice program activities, including assessment meetings;
- Provides overall coordination of program activities nationwide;
- Coordinates the implementation of interventions for Corn and HVCD Programs under PRIR 2030; and
- Coordinates the implementation of approved interventions for different agencies.

DA Regional Executive Directors

- Lead in the development of regional operational plans of the PRIR 2030 in consultation with provinces;
- Provide leadership in the implementation of the plan in the regions;
- Ensure that the regional targets are met; and
- Mobilize support from national and constituent provincial government units.

Regional Rice Focal Persons

- Work closely with the REDs in the development and implementation of the regional rice programs;
- Supervise rice specialists; and
- Coordinate with the provincial agriculturists.

Rice Specialists

- Provide the link between the regions and provinces; and
- Serve as technical resource person on rice production and rice-based farming systems to connect regional and LGU extension services.

Provincial Governors

- Provide overall leadership in the development and implementation of the provincial components of regional operational plans;
- Ensure that the provincial targets are met;
- Ensure provision of provincial counterpart budget and resources; and
- Mobilize support from national government and constituent municipality units.

Provincial Agriculturists

- Provide technical and operational leadership in the development and implementation of the provincial components of regional operational plans; and
- Provide guidance and coordination with the municipal agriculturists toward the attainment of the provincial and municipal targets.

6.2. Roles of Key Institutions

DA-Regional Field Offices (DA-RFOs)

- Responsible in the overall planning, coordination, and monitoring of program implementation in the regions;
- Coordinate, monitor, and implement (through stations) seed production activities;
- Coordinate and monitor implementation of program interventions;

- Update Registry System for Basic Sectors in Agriculture (RSBSA);
- Assist in the evaluation of qualified farmers' organizations/beneficiaries;
- Deploy subject matter specialists;
- Provide accurate and timely reports; and
- Provide resource persons in training courses for AEWs.

Philippine Rice Research Institute

- Conducts in-depth R&D on varietal improvement, integrated crop management, farming systems, farm mechanization, and policy research and advocacy, with emphasis on improving competitiveness, climate resilience, and quality in partnership with other research organizations;
- Produces breeder, foundation, and registered seeds of inbreds and parentals of hybrids;
- Maintains buffer stocks of higher seed classes;
- Provides technical support to LGUs, RFOs, and ATI; and
- Assists in the promotion of mature rice production technologies.

International Rice Research Institute

- Collaborates with PhilRice and other members of NARES in the conduct of rice R&D.

Bureau of Agricultural Research

- Provides funds for research; and
- Identifies technologies generated from the research network.

Bureau of Plant Industry

- Coordinates and monitors seed production;
- Supervises seed testing laboratories;
- Accelerates seed testing and certification; and
- Provides technical assistance on crop protection.

National Irrigation Administration

- Maintains and rehabilitates existing irrigation systems;
- Conducts training courses and institution-building activities for the irrigators' associations;
- Provides technical assistance to LGUs on maintenance, management, and repair of irrigation systems;
- Assists LGUs in selecting cluster sites;
- Coordinates schedules of irrigation water releases and cut-offs with LGUs; and
- Mobilizes its technicians to provide technical assistance to farmers.

Bureau of Soils and Water Management

- Provides technical assistance on the balanced fertilization strategy, small water impounding projects, shallow tube wells, and small farm reservoirs;
- Characterizes and map aquifers;
- Conducts research and development on small-scale irrigation systems and soil

management and fertilization; and
- Leads in providing soil analysis services to farmers.

Agricultural Training Institute
- Administers training, extension, and social preparation programs in coordination with RFOs, SUCs, and LGUs; and
- Monitors and evaluates post-training performances of national agencies and LGUs authorized to conduct training.

Philippine Center for Postharvest Development and Mechanization
- Provides technical assistance on equipment testing and accreditation; and
- Conducts R&D on postharvest technologies and farm mechanization in coordination with other research organizations.

Field Operations Service
- Conducts field monitoring and evaluation of the PRIR 2030 implementation; and
- Consolidates periodic/regular reports of implementation submitted by the RFOs.

DA Program Monitoring and Evaluation Division
- Establishes a comprehensive program monitoring and evaluation system;
- Consolidates provincial and national production performances; and
- Provides details and summary of program accomplishments from the clusters in the municipal, city, provincial, and national levels in coordination with PSA.

Philippine Statistics Authority
- Helps monitor the yield, area, and production performances of each province and the national levels;
- Provides details and summary of program accomplishments at the provincial and national levels in coordination with DA; and
- Monitors price behavior and market trends.

National Food Authority
- Manages the buffer stocks;
- Implements grains supply and price stabilization policies; and
- Provides alternative market to farmers.

Land Bank of the Philippines
- Provides production, processing, and/or marketing loans to farmers, cooperatives, millers, traders, and custom service providers.

Philippine Crop Insurance Corporation
- Provides insurance protection to farmers against losses arising from natural calamities, plant diseases and pest infestations of their palay and corn crops as well as other crops; and
- Provides protection against damage to/loss of non-crop agricultural assets including but not limited to machineries, equipment, transport facilities and other related

infrastructures due to peril/s insured against.

Agricultural Credit Policy Council

- Oversees the implementation of agricultural credit and guarantee programs to ensure that credit is truly made available and accessible to farmers;
- Conducts policy research studies to come up with timely and reliable recommendations on appropriate credit policies and programs for the agriculture sector; and
- Conducts action research studies on innovative financing schemes for farmers.

Fertilizer and Pesticide Authority

- Ensures that available fertilizer grades and pesticides in the market are effective and not hazardous to human health and environment.

State Universities and Colleges

- Conduct extension activities within the provinces or regions of their locations;
- Conduct location-specific research and development;
- Serve as venues for training of AEWs; and
- Mobilize farm land for seed production use.

6.3. Roles of Key Committees

National Steering Committee for the Rice Program

Composed of heads of DA bureaus and attached agencies working in the grains sector, it shall be created for the following purposes:

- Deliberate on policy issues besetting the rice industry;
- Finalize the rice operational plan of the PRIR 2030;
- Formulate guidelines for the implementation of the program;
- Review and set national targets and accomplishments; and
- Provide technical recommendations to its chairperson on the policy directions that should be followed by the rice program.

National Technical Working Group for Rice

Composed of representatives from different DA bureaus, attached agencies, and other relevant government and private sector bodies, it shall be created to perform the following:

- Finalize the rice operational plan of the PRIR 2030 and budgets for the Secretary's approval;
- Formulate guidelines for the implementation of the program;
- Review and set national targets and accomplishments;
- Prepare detailed operational plans, and budgets of the rice program;
- Design a monitoring and reporting system; and
- Periodically assess the roles and contributions of different DA bureaus and attached agencies to program implementation.

National Rice Program Secretariat

- Prepare and consolidate the rice program's detailed work and financial plans;
- Conduct field monitoring to assess the status of program implementation;
- Consolidate, analyze, and prepare summary reports based on progress reports of DA-RFOs, PSA, and other agencies;
- Coordinate with DA-RFOs, the private sector and other concerned agencies to facilitate the implementation of the rice program; and
- Provide technical and staff support to the Rice Program Coordinator and Regional Rice Program Coordinators.

Civil Society Organizations

- Assist the DA, MAs, and LGUs, farmers' associations/organizations/cooperatives in establishing clusters, identifying, and validating the profiles and masterlists of each cluster;
- Actively participate in the planning and implementation of localized rice plans; and
- Provide technical assistance to farmers' associations.

7. Operational Strategies

The following are some of DA's existing operational strategies that can be improved and further used in implementing the strategic interventions outlined in the PRIR 2030.

7.1. Seed and Input Component

- Hybrid and inbred seed and other input support to priority provinces will be given to Institutional Partners through 'Grant-Recovery-Roll-over Scheme'. The DA-RFOs will procure and grant hybrid and inbred seeds of appropriate NSIC-registered varieties to the institutional partners through the LGU. The institutional partners will loan out the seeds to clustered farmer-recipient with agreed repayment scheme/s. The recipients will repay the loan to the institutional partners upon harvest, and will loan out again to the same farmer recipient following the same procedure to promote sustainability of the component.
- The DA-RFOs, LGUs, ACPC, PCIC will assist the recipients for crop insurance coverage and credit access for the other inputs such as fertilizers and pest control.
- Provision of training for high quality seed production for seed exchange is proposed for the remaining provinces not in the priority list. This intervention will also be coupled with higher seed production class to ensure quality source of seeds.

7.2. Production and Harvesting Machinery, and Post-harvest Facilities and Equipment Component

- Mechanization support will focus on the priority provinces to reduce production cost and improve farming efficiencies. This will be provided to Farmer Groups and Association, existing and targeted additional Farm Service Providers.
- The DA-RFOs, LGUs, and BAFE will identify recipients, conduct feasibility assessments and at the same time provide technical support to identified beneficiaries.
- Related extension, training support on machine operation and basic maintenance

will be also provided to these recipients.

7.3. Irrigation Development Component

- Irrigation development will focus on areas with potential especially in medium yielding provinces. This includes National Irrigation Administration (NIA) projects and Small Scale Irrigation projects such as Small Water Impounding Projects, Solar Powered Irrigation Systems, Diversion Dams, and Small Farm Reservoirs.
- The DA-RFOs, LGUs, and BSWM will provide technical support to identified areas and recipients, and conduct feasibility assessments.
- Related extension, training support to maintain these components will also be provided to these recipients.

8. Budgetary Requirement (2019)

Seed Fund Component (P10 billion)

Particulars	Hybrid		Inbred-CS		Combine Harvester		Total
	Area	Cost ('000)	Area	Cost ('000)	No. of Units	Cost ('000)	
NATIONAL	**750,000**	**3,375,000**	**2,523,780**	**4,038,048**	**1,437**	**2,586,952**	**10,000,000**
29 Priority Provinces (>4mt/ha yield)	750,000	3,375,000	1,715,913	2,745,461	1,042	1,875,952	**7,996,413**
28 Priority Provinces (3-4mt/ha yield)			807,867	1,292,587	395	711,000	**2,003,587**
Other Provinces							

Regular Fund Component (P7.4 billion)

Major Components	Budget ('000)
Production Support Services	1,908,877
Extension Support, Education, and Training Services	2,242,161
Research and Development Services	853,368
Agricultural Machinery, Equipment, and Facilities Support Services	650,837
Irrigation Network Services	1,759,031
Grand Total	**7,414,275**

9. The National Rice Roadmap Team

9.1. Advisory Council

Chairperson: Emmanuel F. Piñol, *Secretary, Department of Agriculture*
Members: Segfredo R. Serrano, *Undersecretary for Policy and Planning*
Ariel T. Cayanan, *Undersecretary for Operations and Agri-Fisheries Mechanization*
Sailila E. Abdula, *Acting Executive Director, PhilRice*
Andrew B. Villacorta, *Director, Field Operations Service And Assistant Secretary for Agribusiness*
Carlos L. Magnaye, *Director, Planning and Monitoring Service*
Noel A. Padre, *Director Policy Research Service*
Mercedita A. Sombilla, *Assistant Secretary for Regional Development, NEDA*
Sarah G. Cayona, *Director, PCAF*

9.2. Technical Working Group

Philippine Rice Research Institute
DA- Planning and Monitoring Service
DA-Policy Research Service
DA-Field Operations Services-Field Programs and Operational Planning Division
Philippine Center for Postharvest Development and Mechanization
Bureau of Plant Industry
Bureau of Agricultural Research
Agricultural Training Institute
Bureau of Soil and Water Management
Agricultural Credit and Policy Council
Bureau of Agriculture and Fisheries Standards
Philippine Crop Insurance Corporation
Fertilizer and Pesticide Authority
National Irrigation Administration
National Food Authority
Philippine Statistics Authority
International Rice Research Institute

9.3. Technical Writing Team

Flordeliza H. Bordey	PhilRice
Myriam G. Layaoen	PhilRice
Glenn Estrada	DA-PPD
Toni Marcel Rimando	DA-IPD
Mark Lester Bolotaolo	DA-IPD
Ralph Alan Ceniza	DA-RFO X

9.4. Technical Support Group

Ronald Gregory Roces	DA-FPOPD
Diana Rose Gaspar	DA-FPOPD
Carlos Pedracio	BPI
Aileen Agcaoili	BPI
Edmund Sana	NRP Consultant

Annex 1. Baseline and target adoption of high-quality seeds in high-yield provinces

Province	Estimated % Adoption as of 2017		Target % Adoption as of 2020	
	Hybrid	Inbred	Hybrid	Inbred
Kalinga	6%	59%	17%	67%
Ilocos Norte	33%	40%	61%	30%
Ilocos Sur	28%	47%	55%	37%
La Union	17%	35%	43%	36%
Pangasinan	11%	66%	27%	64%
Cagayan	22%	49%	46%	43%
Isabela	8%	79%	19%	76%
Nueva Vizcaya	6%	65%	16%	70%
Quirino	3%	86%	7%	88%
Aurora	3%	81%	7%	86%
Bataan	2%	72%	6%	82%
Bulacan	4%	88%	10%	87%
Nueva Ecija	21%	78%	39%	60%
Pampanga	3%	87%	8%	87%
Tarlac	10%	65%	24%	66%
Zambales	6%	34%	19%	46%
Laguna	0%	27%	1%	46%
Biliran	2%	20%	7%	35%
Southern Leyte	7%	5%	29%	9%
Zamboanga del Sur	8%	12%	29%	18%
Zamboanga Sibugay	5%	31%	18%	44%
Bukidnon	13%	29%	37%	34%
Lanao del Norte	4%	41%	13%	56%
Misamis Occidental	2%	47%	8%	63%
Misamis Oriental	3%	8%	15%	14%
Davao del Norte	2%	39%	8%	56%
Davao del Sur	4%	32%	13%	47%
Davao Oriental	5%	52%	15%	63%
North Cotabato	0%	40%	1%	61%

Annex 2. Baseline and target adoption of high-quality seeds in medium-yield provinces

Province	Estimated % Adoption as of 2017		Target % Adoption as of 2020	
	Hybrid	Inbred	Hybrid	Inbred
Ifugao	0%	1%	0%	3%
Cavite	7%	13%	10%	26%
Quezon	2%	24%	3%	42%
Occidental Mindoro	8%	28%	11%	46%
Oriental Mindoro	0%	40%	0%	62%
Palawan	0%	7%	0%	14%
Albay	8%	21%	11%	36%
Camarines Sur	3%	22%	4%	40%
Masbate	0%	22%	0%	40%
Sorsogon	6%	15%	9%	29%
Aklan	5%	21%	7%	37%
Antique	2%	22%	3%	39%
Capiz	1%	34%	1%	55%
Iloilo	0%	8%	1%	17%
Negros Occidental	0%	42%	0%	63%
Bohol	18%	7%	27%	13%
Negros Oriental	6%	23%	8%	39%
Leyte	9%	40%	11%	58%
Samar (Western Samar)	3%	30%	3%	49%
Compostela Valley	12%	57%	12%	72%
Sarangani	0%	30%	0%	50%
South Cotabato	0%	43%	0%	64%
Sultan Kudarat	1%	17%	1%	33%
Agusan del Norte	1%	57%	1%	76%
Agusan del Sur	4%	39%	5%	59%
Surigao del Sur	5%	37%	6%	57%
Lanao del Sur	0%	3%	0%	6%
Maguindanao	1%	8%	1%	17%

Annex 3. Average production, area harvested, yield, cost/kg, and % of irrigated area harvested in priority provinces (2013, 2014, 2017)

Region	Province	Production (t)	Area (ha)	Yield (t/ha)	Cost of Production (P/kg)	% Irrigated Area Harvested
CAR	Kalinga	174,611	36,666	4.76	11.44	94.67
CAR	Ifugao	62,947	17,247	3.65	13.92	95.01
ILOCOS	Pangasinan	1,101,275	258,209	4.27	12.33	68.65
ILOCOS	Ilocos Norte	318,835	66,786	4.77	13.72	82.38
ILOCOS	La Union	171,058	37,052	4.62	14.54	61.72
ILOCOS	Ilocos Sur	214,944	48,303	4.45	16.54	59.14
CAGAYAN	Isabela	1,271,060	284,076	4.47	11.40	91.46
CAGAYAN	Cagayan	910,479	222,314	4.10	15.61	79.35
CAGAYAN	Nueva Vizcaya	260,056	59,284	4.39	12.05	94.03
CAGAYAN	Quirino	90,051	22,286	4.04	13.70	89.61
CENTRAL LUZON	Nueva Ecija	1,829,251	319,234	5.73	10.90	88.63
CENTRAL LUZON	Tarlac	600,999	135,461	4.44	12.47	92.20
CENTRAL LUZON	Pampanga	427,411	91,621	4.66	10.71	96.78
CENTRAL LUZON	Bulacan	372,375	82,277	4.53	12.63	82.01
CENTRAL LUZON	Bataan	143,797	31,564	4.56	11.83	98.39
CENTRAL LUZON	Aurora	94,288	23,025	4.10	11.37	93.40
CENTRAL LUZON	Zambales	135,021	33,130	4.08	14.69	74.32
CALABARZON	Laguna	129,722	30,337	4.28	12.31	98.95
CALABARZON	Cavite	41,063	11,092	3.70	10.45	91.49
CALABARZON	Quezon	162,594	51,837	3.14	12.89	53.40
MIMAROPA	Oriental Mindoro	408,613	104,200	3.92	14.30	81.76
MIMAROPA	Palawan	290,603	82,154	3.54	10.38	54.80
MIMAROPA	Occidental Mindoro	340,784	85,309	3.99	14.85	66.63
BICOL	Camarines Sur	622,887	162,636	3.83	8.78	75.04

BICOL	Albay	217,168	54,545	3.98	8.80	79.51
BICOL	Sorsogon	136,873	35,091	3.90	10.02	71.17
BICOL	Masbate	169,219	56,025	3.02	11.45	25.97
WESTERN VISAYAS	Negros Occidental	477,208	123,970	3.85	11.23	67.06
WESTERN VISAYAS	Iloilo	868,786	267,203	3.25	11.57	42.74
WESTERN VISAYAS	Capiz	320,674	100,228	3.20	10.99	28.63
WESTERN VISAYAS	Antique	286,601	81,561	3.51	10.86	56.93
WESTERN VISAYAS	Aklan	120,601	37,957	3.18	11.67	48.81
CENTRAL VISAYAS	Negros Oriental	68,363	22,299	3.07	15.57	77.90
CENTRAL VISAYAS	Bohol	250,062	75,825	3.30	13.91	50.09
EASTERN VISAYAS	Leyte	495,460	125,183	3.96	9.94	64.21
EASTERN VISAYAS	Biliran	65,954	14,660	4.50	10.81	99.44
EASTERN VISAYAS	Southern Leyte	87,593	21,586	4.06	13.94	87.77
EASTERN VISAYAS	Samar (Western Samar)	145,696	55,182	2.64	10.45	8.82
ZAMBOANGA PENINSULA	Zamboanga del Sur	347,645	77,772	4.47	11.39	75.23
ZAMBOANGA PENINSULA	Zamboanga Sibugay	178,562	44,239	4.04	12.21	40.29
NORTHERN MINDANAO	Bukidnon	428,078	94,950	4.51	11.75	87.58
NORTHERN MINDANAO	Misamis Occidental	83,720	19,453	4.30	11.46	91.59
NORTHERN MINDANAO	Lanao del Norte	172,202	40,107	4.29	10.32	83.22
NORTHERN MINDANAO	Misamis Oriental	25,101	6,166	4.07	12.11	92.40
DAVAO	Davao Oriental	64,767	15,009	4.32	14.27	73.55
DAVAO	Davao del Sur	130,141	26,652	4.88	14.04	97.04
DAVAO	Davao del Norte	123,787	30,837	4.01	14.55	90.68
DAVAO	Compostela Valley	101,337	25,626	3.95	12.77	82.35
SOCCSKSARGEN	North Cotabato	518,647	128,508	4.04	12.78	72.87
SOCCSKSARGEN	Sultan Kudarat	434,146	117,824	3.68	12.38	80.50
SOCCSKSARGEN	South Cotabato	344,295	88,966	3.87	11.55	81.34
SOCCSKSARGEN	Sarangani	46,912	14,178	3.31	14.10	72.27
CARAGA	Agusan del Norte	92,057	25,942	3.55	11.49	77.48

CARAGA	Surigao del Sur	104,610	32,777	3.19	10.53	65.10
CARAGA	Agusan del Sur	281,514	86,011	3.27	13.33	44.38
ARMM	Maguindanao	397,506	154,608	2.57	11.76	20.39
ARMM	Lanao del Sur	178,544	64,089	2.79	10.85	26.89

Annex 4. Average production, area harvested, yield, cost/kg, and % of irrigated area harvested in other provinces (2013, 2014, 2017)

Region	Province	Production (MT)	Area (ha.)	Yield (MT/ha.)	Cost of Production (PhP/kg)	% Irrigated Area Harvested
CAR	Abra	74,807	24,034	3.11	16.16	62.14
CAR	Apayao	103,745	27,584	3.76	12.48	61.03
CAR	Benguet	18,374	6,516	2.82	18.14	82.64
CAR	Mountain Province	18,111	5,936	3.05	15.69	84.81
CAGAYAN	Batanes	58	57	1.01	13.19	2.81
CALABARZON	Batangas	46,940	14,629	3.21	16.29	64.24
CALABARZON	Rizal	29,081	8,249	3.53	15.10	77.61
MIMAROPA	Marinduque	18,122	6,532	2.77	12.54	43.72
MIMAROPA	Romblon	33,761	10,580	3.19	13.58	50.78
BICOL	Camarines Norte	98,431	25,838	3.81	12.66	61.49
BICOL	Catanduanes	34,243	11,395	3.01	12.36	46.77
WESTERN VISAYAS	Guimaras	50,863	19,015	2.67	10.19	17.97
CENTRAL VISAYAS	Cebu	16,313	4,950	3.30	14.49	90.10
CENTRAL VISAYAS	Siquijor	2,504	696	3.60	16.76	87.16
EASTERN VISAYAS	Eastern Samar	62,195	21,826	2.85	8.81	22.84
EASTERN VISAYAS	Northern Samar	115,754	40,916	2.83	10.75	10.69
ZAMBOANGA PENINSULA	Zamboanga City	27,283	7,322	3.73	11.84	65.95
ZAMBOANGA PENINSULA	Zamboanga del Norte	112,003	36,402	3.08	13.87	42.35
NORTHERN MINDANAO	Camiguin	2,366	634	3.73	14.76	99.26
DAVAO	Davao City	15,842	4,625	3.43	17.97	54.98
CARAGA	Dinagat Islands	6,831	3,033	2.25	18.11	69.33
CARAGA	Surigao del Norte	61,991	20,881	2.97	13.46	70.81
ARMM	Basilan	3,555	1,373	2.59	11.64	87.40
ARMM	Sulu	2,285	1,455	1.57	19.24	6.18
ARMM	Tawi-tawi	515	247	2.09	14.47	0.00

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