



# Baselining and Benchmarking: Rapid Assessment for Agri- Fisheries Sector Transformation

ADB TA 9681 REG: Formulation of National Agriculture and Fisheries  
Modernization and Industrialization Plan (NAFMIP) 2020-2030

December 2021



Food and Agriculture  
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## ACRONYMS

ABC	Agriculture Business Corridor
ADB	Asian Development Bank
A&F	Agriculture and Fisheries
AF	Agri-Fishery
AFF	Agriculture, Forestry, and Fisheries
AFID	Agriculture and Fisheries Information Division
AFMA	Agriculture and Fisheries Modernization Act
AFMP	Agriculture and Fisheries Modernization Plan
AFYC	Agricultural and Fishery Youthpreneur Council
AqBC	Aquaculture Business Corridor
AIGC	Agri-Industrial Growth Corridor
AMAS	Agribusiness and Marketing Assistance Service
ARMM	Autonomous Region in Muslim Mindanao
ASEAN	Association of Southeast Asian Nations
ASF	African swine fever
BAC	Bayanihan agri-cluster
CAFC	City Agricultural and Fishery Council
CAMP	Coalition for Agriculture Modernization
CAR	Cordillera Administrative Region
CLDI	Composite land degradation index
COVID	Corona virus disease
CRAO	Climate Resilience Agriculture Office, DA
CRVA	Climate risk vulnerability assessment
DA	Department of Agriculture
DAFC	District Agricultural and Fishery Council
DAR	Department of Agrarian Reform
DENR	Department of Environment and Natural Resources
DOST	Department of Science and Technology
DTI	Department of Trade and Industry
ESET	
eVSA	Expanded vulnerability and suitability assessment
FAO	Food and Agriculture Organization
FARMC	Fisheries and Aquatic Resources Management Council
FGD	Focus group discussion
GAA	General Appropriations Act
GDP	Gross domestic product
GSCS	Geographically specialized commodity system
GVA	Gross value added
HRD	Human resource development
HUCAFC	Highly Urbanized City Agricultural and Fishery Council
IAD	International Affairs Division
ICCAFC	Independent Component City Agricultural and Fishery Council
iCARE	Innovative Consultation for Agriculture and Fishery Policy Reforms and Engagement
ICT	Information and communication technology
ICTS	Information and Communication Technology Service
IEC	Information, education, and communication
ILUP	Integrated land use planning
InfoACE	Information, Advocacy, Communication and Education Unit
IR	Inception report
ISPF	Integrated spatial planning framework
ITU	International Telecommunication Union
IUU	Illegal, unreported, and unregulated (fishing activities)

LGC	Local Government Code
LGU	Local government unit
MAFC	Municipal Agricultural and Fishery Council
M&E	Monitoring and evaluation
MIMAROPA	Occidental Mindoro, Oriental Mindoro, Marinduque, Romblon, and Palawan
MPA	Marine protected area
MSE	Micro and small enterprise
MSME	Micro, small, and medium enterprises
NAFC	National Agricultural and Fishery Council
NAFMIP	National Agriculture and Fisheries Modernization and Industrialization Plan
NAMRIA	National Mapping and Resources Information Authority
NBPC	National Banner Program Committee
NEDA	National Economic and Development Authority
NGA	National government agency
NIN	National Information Network
ODA	Official Development Assistance
OPPC	Other DA Priority Program Committee
PAFES	Provincial Agriculture and Fisheries Extension Services
PAFC	Provincial Agricultural and Fishery Council
PCAF	Philippine Council for Agriculture and Fisheries
PCAARRD	Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development
PCOO	Presidential Communications Operations Office
PDP	Philippine Development Plan
PHD	Planetary health diet
PHP	Philippine peso
PIP	Public Investment Program
PMS	Office of Planning and Monitoring Service
PAP	Programs, projects, and activities
PRDP	Philippine Rural Development Project
RAFC	Regional Agricultural and Fishery Council
RBME	Results-Based Monitoring and Evaluation
RCEP	Regional Comprehensive Economic Partnership
RDE	Research, development, and extension
RO	Regional Office
SAFDZ	Strategic Agriculture and Fisheries Development Zones
SEARCA	Southeast Asian Regional Center for Graduate Study and Research in Agriculture
SGV	Sycip Gorres Velayo & Co.
SLM	Sustainable land management
SLWM	Sustainable land and water management
SSM	Sustainable soil management
PHI	Philippines
TA	Technical Assistance
TBI	Technology Business Incubation
TCW	Technology Commercialization on Wheels
VCA	Value chain analysis
WeAdVoCATE	Advance Voices and Choices of the A&F Sector Toward Empowering Enterprises
WeCONSULT	We Collaborate with Networks of Agriculture and Fishery Stakeholders to Unify and Lead Transformation
WeINSPIRE	We Institutionalize and Nurture Systems and Processes for Integrated and Reliable Management
WeTRACK	We Transform Results into Actions through Collaborations and Knowledge Sharing

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## Preface

This sector assessment report comprising 11 chapters examines the state of affairs of the agri-fisheries (AF) sector in the country and generates initial strategic and operational analyses for developing the NAFMIP 2020-2030. It reviews the performance of the agri-fisheries sector, linked closely to the Agriculture and Fisheries Modernization Plans (AFMP) of 2011-2017 and 2018-2023. The assessment, however, does not dwell *per se* on targets versus accomplishments in terms of income, production, productivity, markets, trade, access to credit and insurance, access to services, and other indicators—as these are covered in DA, NEDA and other reports. Rather, the assessment examines how the sector has adopted agri-industrialization and other transformative strategies to modernize agriculture and fisheries in the country and achieve its targets.

While report preparation started with an outline attached to the SEARCA-FAO Inception Report of 24 March 2021, its structure has evolved. For instance, a separate chapter on digital agriculture has become irrelevant with digital considerations cutting across and incorporated in the various areas of concern (i.e., from sector planning, production, throughout the value chain; in R&D, training, extension, education; M&E, logistics, and communication). The report covers what it set out to examine and analyze according to the data and information that the NAFMIP Preparation Team Members from FAO Philippines, SEARCA, and SGV have been privileged to access with the kind cooperation of DA partners, along with other existing reports and data sources, and informed by the 15 or so specializations they represented.

The contents of this assessment report provide the contexts for NAFMIP preparation and specifically provide inputs to (1) meetings with DA and ADB; (2) preparing the NAFMIP Results Framework; (3) national and sub-national planning workshops; and (4) multi-sector stakeholder consultations that serve as building blocks for developing the Plan.

## Executive Summary

The evidence-based sector-wide assessment opens with analyzing time-series global and regional trade data and agriculture and fisheries policies. It presents evidence of the agri-fisheries sector constituting the country's poor and questions the decades of government support in the form of subsidies toward rice self-sufficiency. The analysis presents a strong case for diversification in production systems and value chains—a shift from single commodity focus toward a commodity systems approach to planning, implementing, monitoring, and evaluating the transformation of the agri-fisheries sector. The narratives in various chapters acknowledge and align with the DA Food Security/New Thinking composed of eight paradigms and the OneDA holistic approach to agri-fisheries transformation. The report then puts primacy on the health and welfare of all food consumers and environmental sustainability with the aim of building a dynamic agri- fishery-food economy.

Furthering the value chains approach and climate resiliency planning introduced since AFMP 2011-2017, the assessment points the way to operationalizing agri-fishery industrial business corridors with the benefit of digital technology advances in spatial planning, calling for further building up as well as consolidating the agri-fishery and whole-of government bureaucracy's capacities and initiatives in spatial planning, data analysis, and data management. The assessment also factors the status and requirements in infrastructure and logistics and agricultural credit toward a modernizing and industrializing AF sector. Further, the report takes note of the impacts of the current COVID-19 pandemic on sector performance and draws lessons and recommendations from its lessons.

The AF sector accomplishments in research, technology development, extension, education and training are well noted. Changes in the agricultural innovation system toward transforming the sector into a dynamically modernizing and industrializing one, with strategies of consolidation and professionalization, are asserted.

Finally, cross-cutting analyses in governance, monitoring and evaluation, and on communicating strategically with various AF stakeholders call for rethinking how we organize for promoting readiness and engagement of stakeholders and partners in, implementing, and monitoring and evaluating agri-fishery and food systems transformation if we are serious about reaching *Masaganang Ani at Mataas na Kita* toward *Ambisyon Natin 2040*.

## CHAPTER 1

# A Critical Assessment of Philippine Agri-Fisheries and Food: Drawing Insights for Transformation and Poverty Reduction<sup>1</sup>

### Introduction

This is an assessment of the development in agri-fisheries and food manufacturing (agri-fishery-food) commodities in the Philippines. The objective was to analyze the historical performance of agri-fishery-food in terms of output, employment and international trade in order to draw lessons for policy. The paper also examines the support for agri-fisheries. The paper identifies agri-fishery-food commodities where the Philippines has comparative advantage. The poverty-agri-fisheries link is critical to the vision of zero poverty by 2040 as stated in the long-term development program *Ambisyon Natin 2040*. The paper provides an analysis on this link and of the possible effects of out-migrating agricultural labor on urban poverty.

The chapter is organized in seven parts and one appendix. After a short introduction in Part 1, Part 2 discusses the performance of agri-fishery-food output and employment in terms of growth and sectoral structure. Part 3 examines the Philippine agri-fisheries trade, while Part 4 analyzes the support to agri-fisheries. Part 5 presents estimates of agri-fisheries revealed comparative advantage relative to the world and to regional markets in the soon-to-be implemented Regional Comprehensive Economic Partnership (RCEP), and the Association of Southeast Asian Nations (ASEAN). Part 6 examines the link between poverty and agri-fisheries in the Philippines. Lastly, Part 7 will draw from the analysis some insights for policy.

The chapter appendix provides a chronological list of key laws pertaining to agri-fisheries from the most recent one to the mid-1990s when the World Trade Organization (WTO) began.

### Developments in Philippine Agri-Fisheries and Food

This section discusses the performance of agri-fisheries and food sectors in the Philippines. The discussion covers agricultural crops, livestock, fishery and food manufacturing. The section examines the historical growth of output, employment and employment productivity relative to the rest of the economy, as well as the performance of the sector relative to agri-fisheries and food sectoral growth in neighboring Asian countries. Also, the section compares the educational attainment and the average age of agri-fisheries labor with the other sectors of the economy.

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<sup>1</sup> Prepared by Caesar B. Cororaton, PhD, Policy, Trade and Regulations Expert, SEARCA

## Output

**Agri-fisheries.** Figure 1.1, Growth Rate in Constant Prices presents data on the comparative growth of the economy and its major sectors (agri-fisheries, industry and services) from 2000 to 2019. Over the period, the economy expanded by an average of 5.4% per year (GDP), while agri-fisheries increased at a significantly slower rate of 2.3% per year (bar chart). Industry and services grew by an average of 5.4% per year and 6.0% per year, respectively.

Agri-fisheries lags behind industry and services over the years. Figure 1.2: Sectoral Shares of Gross Domestic Product, % shows a consistent decline in the share of agri-fisheries over time from 14.0% in 2000 to 8.3% in 2019. In contrast, the relatively higher growth of services resulted in increasing share.

Agri-fisheries has five sub-sectors: crops, livestock, poultry and eggs, fishing and aquaculture, and support activities. Figure 1.3 indicates that production of crops dominates agri-fisheries, capturing 50% of total production. The share of livestock fluctuates between 15% and 18%, while poultry between 9% and 10%. The share of fishing and aquaculture declines from about 18% in the early 2000s to 13.5% in 2019.

Several commodities are produced under crops. Table 1.1 provides a list of major crops produced and their corresponding shares from 1993 to 2019. *Palay* dominates production with share increasing from 30.8% in 1993-1995 to 38.7% in 2017-2019. The other dominant crop production is banana with share rapidly increasing from 5.8% in 1993-1995 to 16.0% in 2017-2019. The share of corn production has declined slightly from 11.7% in 1993-1995 to 10.4% in 2017-2019, as well as the share of coconut including copra from 11.3% to 9.7%, and sugarcane from 5.8% to 3.2% over the same period. The individual shares of the other crops in the table are minimal over the years.

**Table 1.1: Production Structure of Agriculture Crops (% shares)**

Agricultural Crop	1993-1995	2008-2010	2017-2019
<i>Palay</i>	30.8	37.2	38.7
Corn	11.7	10.7	10.4
Coconut including copra	11.3	12.1	9.7
Sugarcane	5.8	4.1	3.2
Banana	5.8	13.9	16.0
Mango	4.1	3.2	3.8
Pineapple	2.7	1.8	3.2
Coffee	2.5	1.0	0.7
Cassava	2.1	2.1	2.6
Rubber	0.8	3.0	1.2
Cacao	0.0	0.2	0.2
Abaca	0.8	0.3	0.2
Tobacco	0.9	0.3	0.2
Others	20.7	10.1	10.0
Total	100.0	100.0	100.0

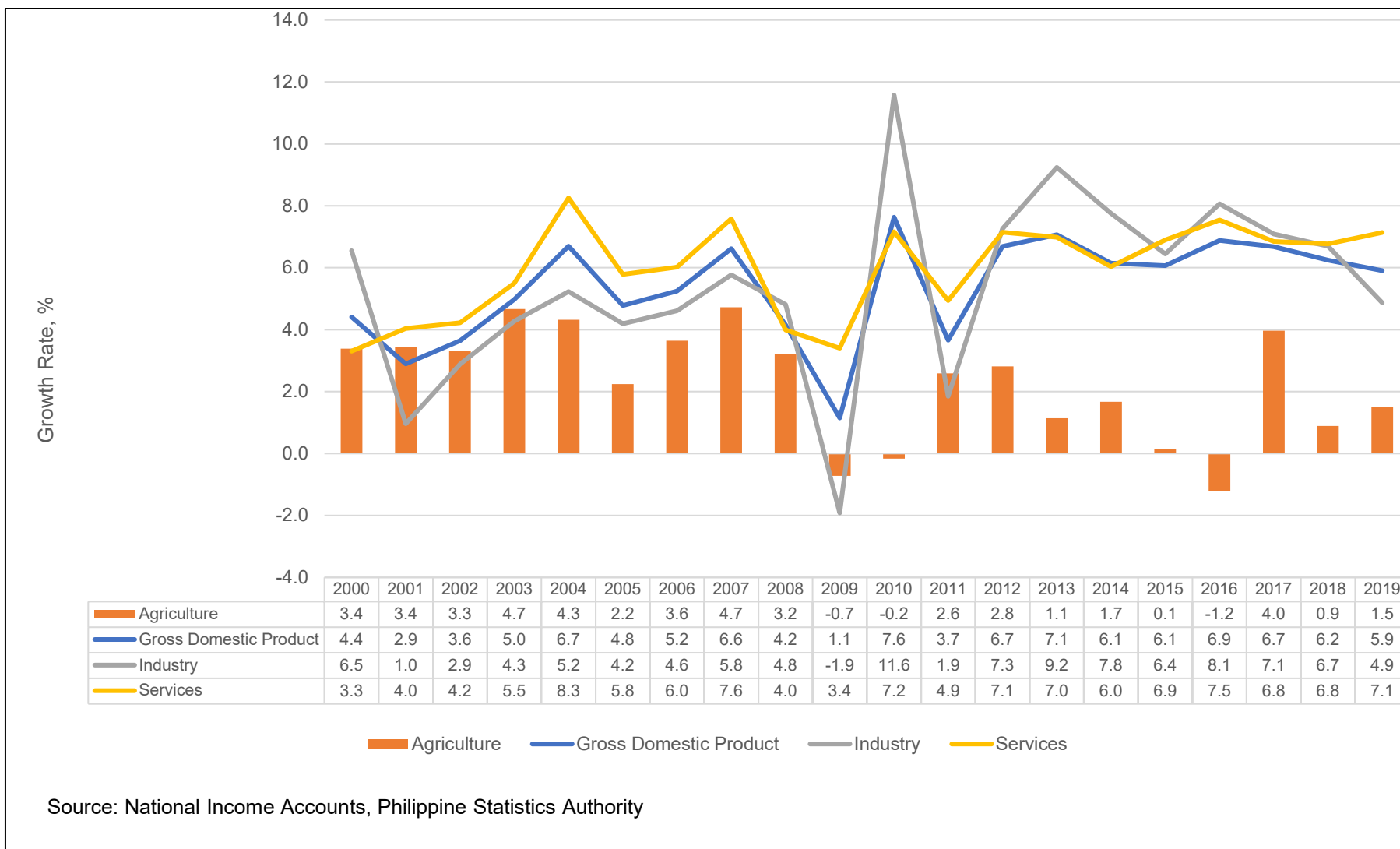
Source: Philippine Statistics Authority



Overall, the structure of crop production over the last two decades has not changed. Except for the increasing share of banana, crop production in the country has generally stagnated and has not diversified.

**Food manufacturing.** Agri-fisheries provides raw materials to the food manufacturing sector for processing into final consumable commodities. Figure 1.4 compares the development of agri-fisheries and food manufacturing in the last two decades. From 2000 to 2010, the average share of agri-fisheries was 13.7% while the share of food manufacturing was 9.3%. However, the share of agri-fisheries dropped from 14.1% in 2011 to 8.8% in 2019, while the share of food manufacturing remained relatively stable between 9 and 10%. As a result, in 2000-2009, agri-fisheries expanded by 3.7% per year, while food manufacturing grew by 4.3% per year (Figure 1.5). In 2010-2019, agri-fisheries grew by 1.9% per year, while food manufacturing grew by 4.3% per year. These trends imply that in the last decade, because of declining share of agri-fisheries due to lack of product diversification within the sector (dominated largely by *palay* production), the food manufacturing sector has shifted its source of raw materials for processing from domestic agri-fisheries to imports.

Figure 1.1: Growth Rate in Constant Prices, %



Source: National Income Accounts, Philippine Statistics Authority

Figure 1.2: Sectoral Shares of Gross Domestic Product, %

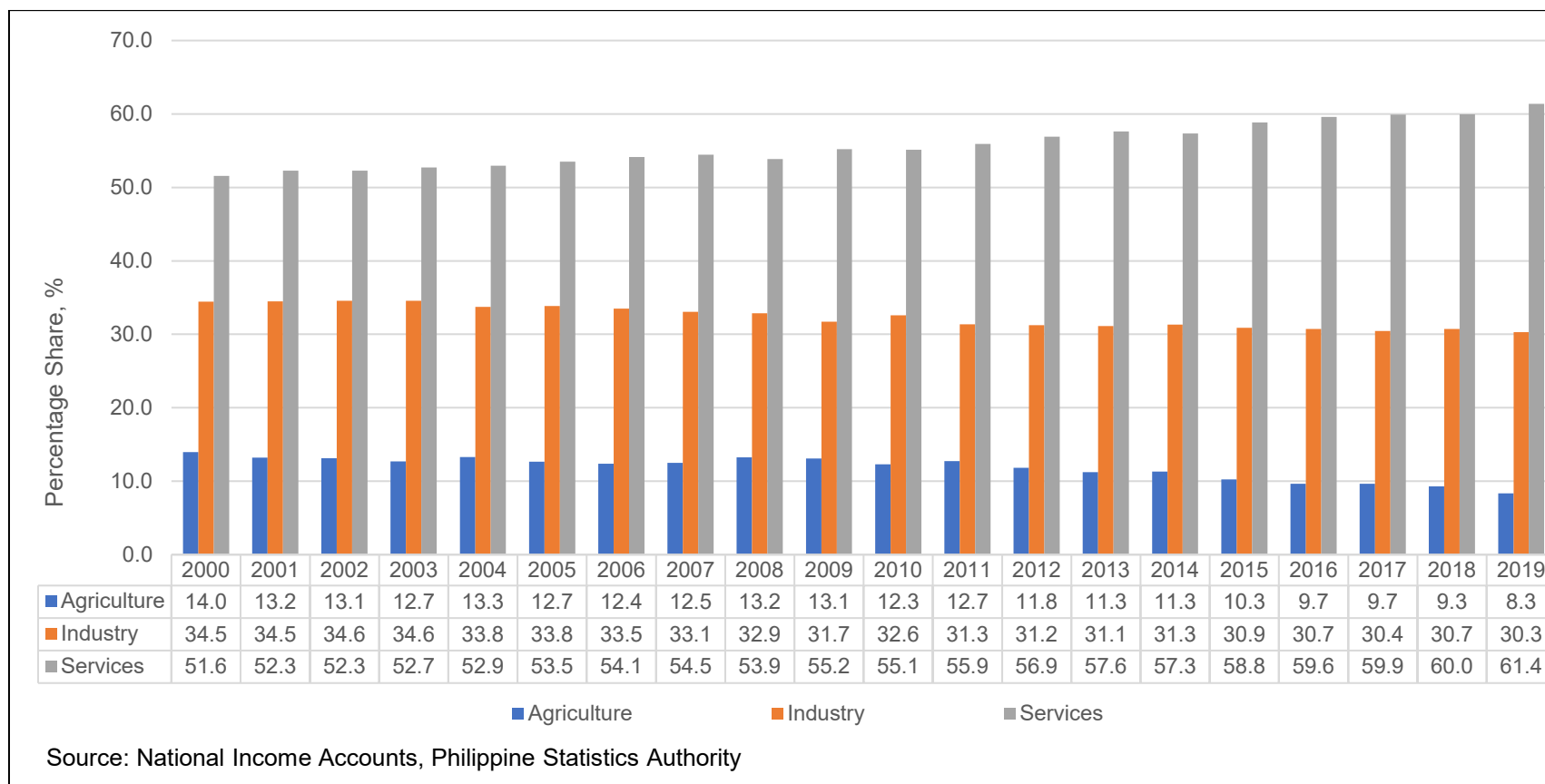
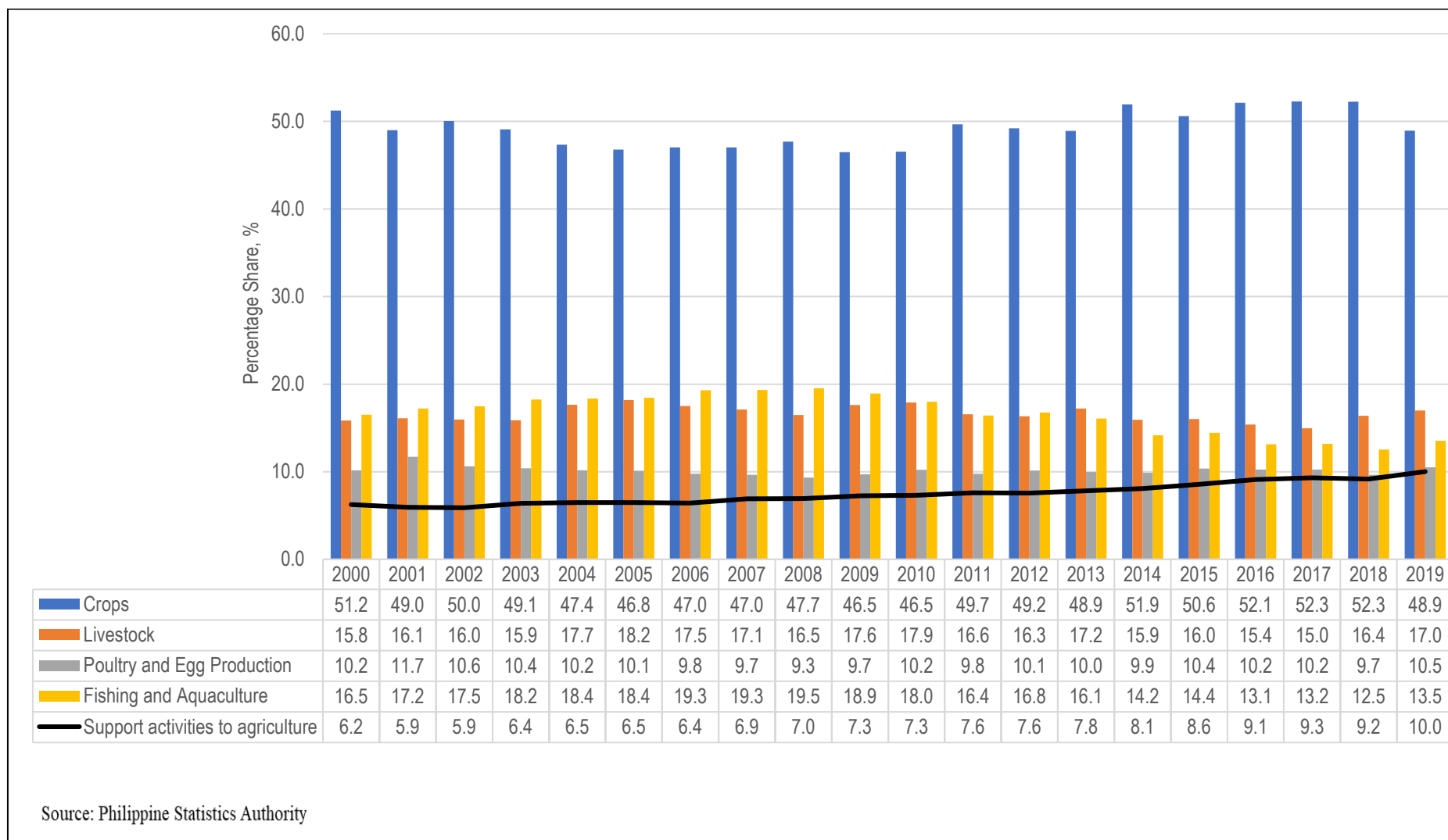
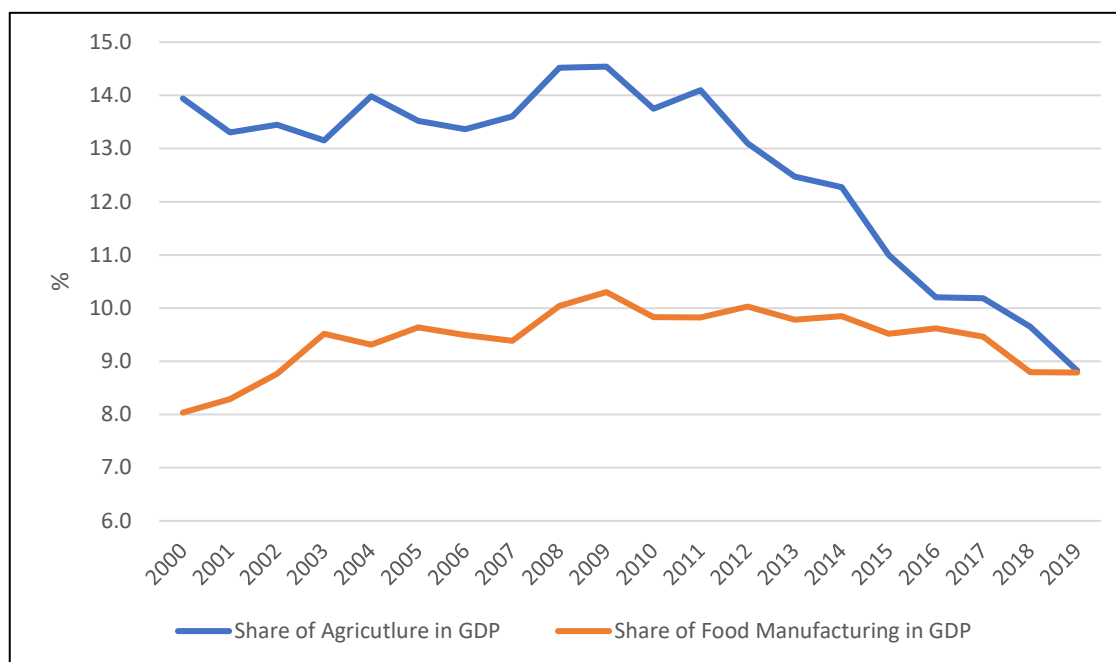


Figure 1.3: Production Structure of Agri-Fisheries, including Support Activities (% Shares)

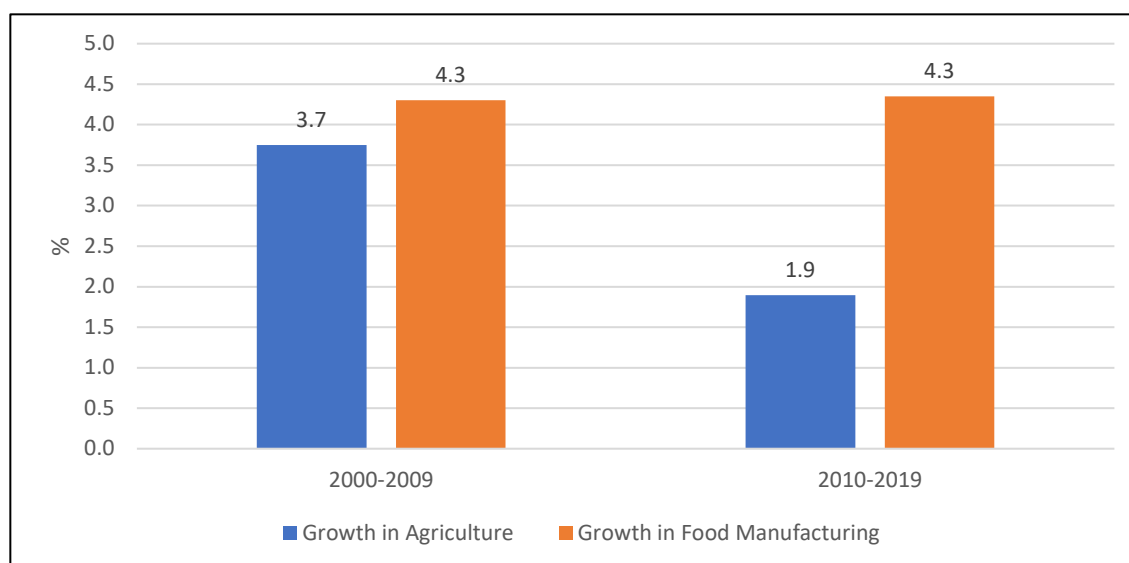


**Figure 1.4: Share of Agri-Fisheries and Food Manufacturing in GDP (%)**



Source: Philippine Statistical Authority

**Figure 1.5: Comparative Growth of Agri-Fisheries and Food Manufacturing, % average per year**



Source: Philippine Statistical Authority

**Comparison with other Asian countries.** The growth of Philippine agri-fisheries lags behind the agricultural sector growth in Vietnam, Thailand, Malaysia, Indonesia, China, and India as indicated by the index of agri-fisheries production in Figure 1.6. The production indices indicate that from 1990 to 2019, agri-fisheries production in Philippines has expanded by 81.2% (bar chart), significantly lower than the growth of agri-fisheries production in Vietnam of 230%; China, 167.7%; Indonesia, 143.5%; India, 132.3%; Malaysia, 105.3%; and Thailand, 90.4%.

In terms of agricultural crop production, the Philippines is second from the bottom of the list in Figure 1.7. From 1993 to 2019, Philippine crop production expanded by 56.3% (bar chart),

Figure 1.6: Index of Agri-Fisheries Production in Selected Asian Countries, 1990-2019

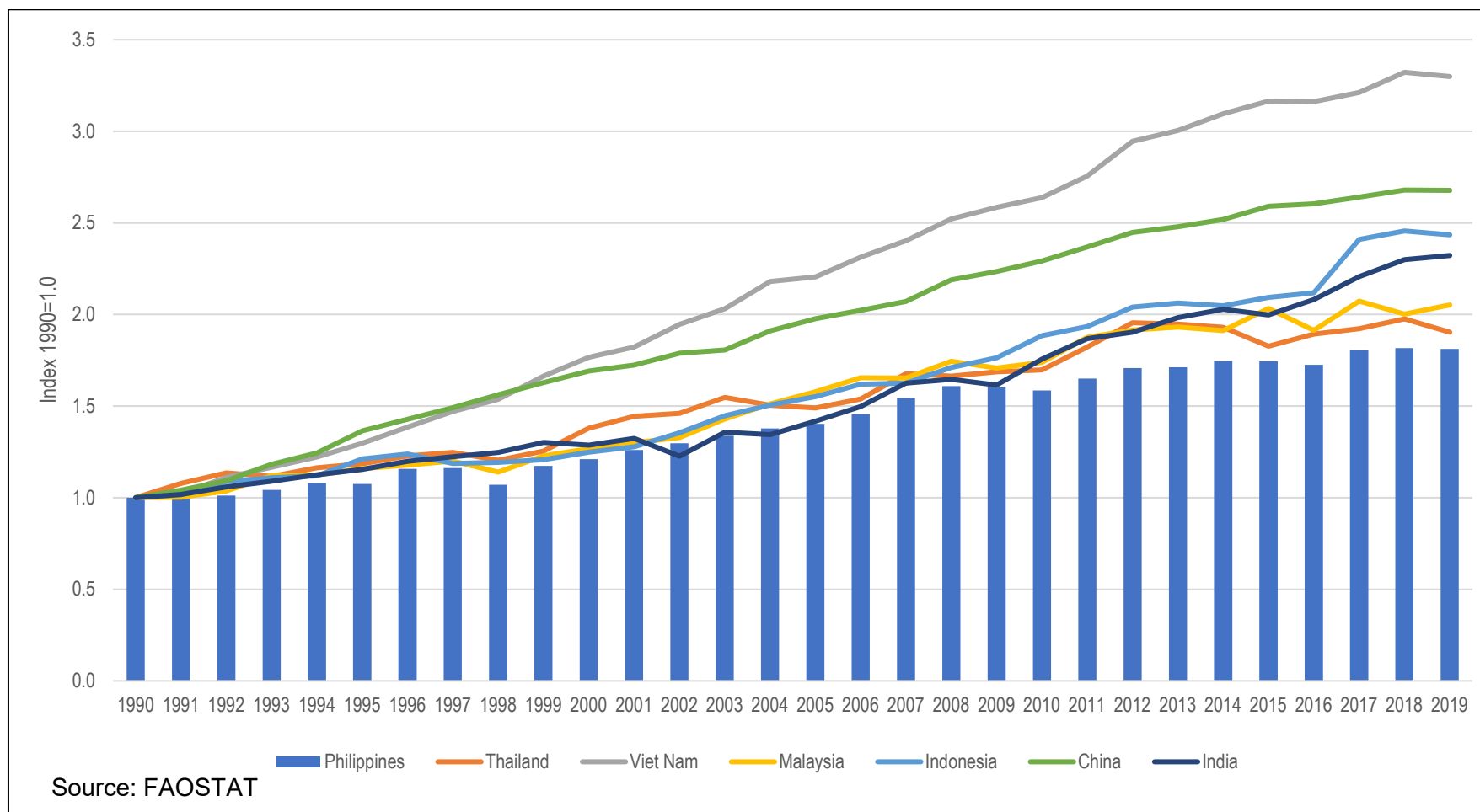
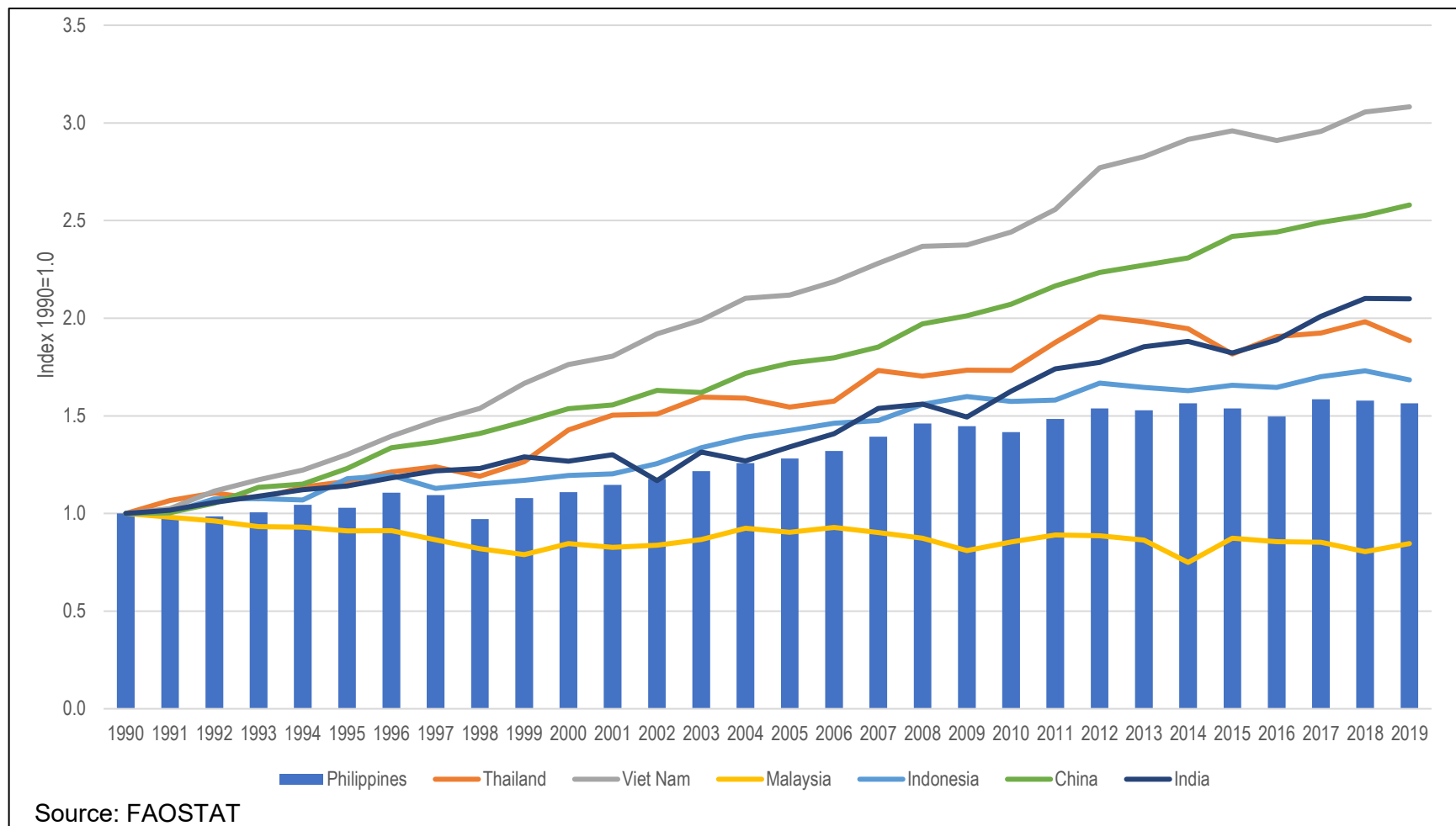




Figure 1.7: Index of Agricultural Crop Production in Selected Asian Countries, 1990-2019



which is lower than the growth in Vietnam (208.2%), China (158.0%), India (110.0%), Thailand (88.6%), and Indonesia (68.4%). The bottom in the list is Malaysia, where crop production contracted by 15.5%.

The growth of livestock production in the Philippines is at par with Vietnam, which sustained high growth over the last three decades as shown in Figure 1.8. From 1993 to 2019, Philippine livestock expanded by 211.7% (bar chart), slightly higher than the growth in Vietnam (200.7%). The growth in livestock production in the rest of the countries in the list is much lower compared to the Philippines and Vietnam.

However, since livestock production only accounts for about 17% of agri-fisheries, its historically high growth was not enough to fill the gap in the overall food production in the country. From 1993 to 2019, food production in the Philippines expanded by 82.5% (bar chart, Figure 1.9), significantly lower compared to the growth in Vietnam (333.6%), Indonesia (253.1%), China (210.3%), India (193.3%), and Malaysia (175.0%). The growth in food production in the Philippines is slightly higher than the growth in Thailand, which grew by 72.4% over the period.

## **Employment**

**Employment structure.** Figure 1.10 presents the structure of employment in major sectors of the economy: agri-fisheries, industry, and services from 2001 to 2018. During the period, the share of employment in agri-fisheries dropped by 13.8 percentage points from 38.4% in 2001 to 24.6% in 2018. The share of employment in services expanded by 10.6 percentage points from 45.9% in 2001 to 56.5% in 2018, while the share of employment in industry increased by 3.1 percentage points from 15.8% in 2001 to 18.9% in 2018. Thus, the period shows a significant net outmigration from agri-fisheries to industry and services. One reason behind the labor movement is the redundant/surplus labor in agri-fisheries, which leads to low labor productivity. This is highlighted in the next section.

Table 1.3 presents the breakdown of sectoral employment. The shares of agri-fisheries and forestry declined from 2001 to 2018. The increase in the employment share in industry is largely due to the increase in construction. The overall employment share of manufacturing has declined, but the employment share of food manufacturing slightly improved. Within the service sector, the employment share improved in trade (particularly retail trade), and transportation (particularly land transportation). The employment share of public administration improved as well during the period. Employment in other service activities, which include private households with employed persons, is relatively stable at about six percent of total employment.

**Employment productivity.** Employment productivity is defined as the ratio between the sectoral gross value added (GVA) expressed in 2018 prices from the National Income Accounts (NIA) of the Philippine Statistical Authority (PSA) and the corresponding sectoral employment from the Labor Force Survey (LFS) of the PSA. The employment data is average of the four rounds of LFS (January, April, July and October). The employment productivity data in the analysis is expressed in thousand pesos in 2018 prices.

Figure 1.11 presents the employment productivity trend in major sectors. Agriculture has the lowest employment productivity (bar chart). Although agricultural employment productivity improved from PHP95.5 thousand in 2001 prices to PHP171.9 thousand in 2018, on the average the employment productivity in the sector is 60.7% below the national average, 64.6% lower compared to the services sector and 79.4% lower relative to industry. As highlighted earlier, the surplus labor in agri-fisheries leads to extremely low GVA/employment ratio sustained over a very long period. Outmigration of labor is therefore a natural consequence as labor seeks higher income from the other sectors of the economy.

Figure 1.8: Index of Livestock Production in Selected Asian Countries, 1990-2019

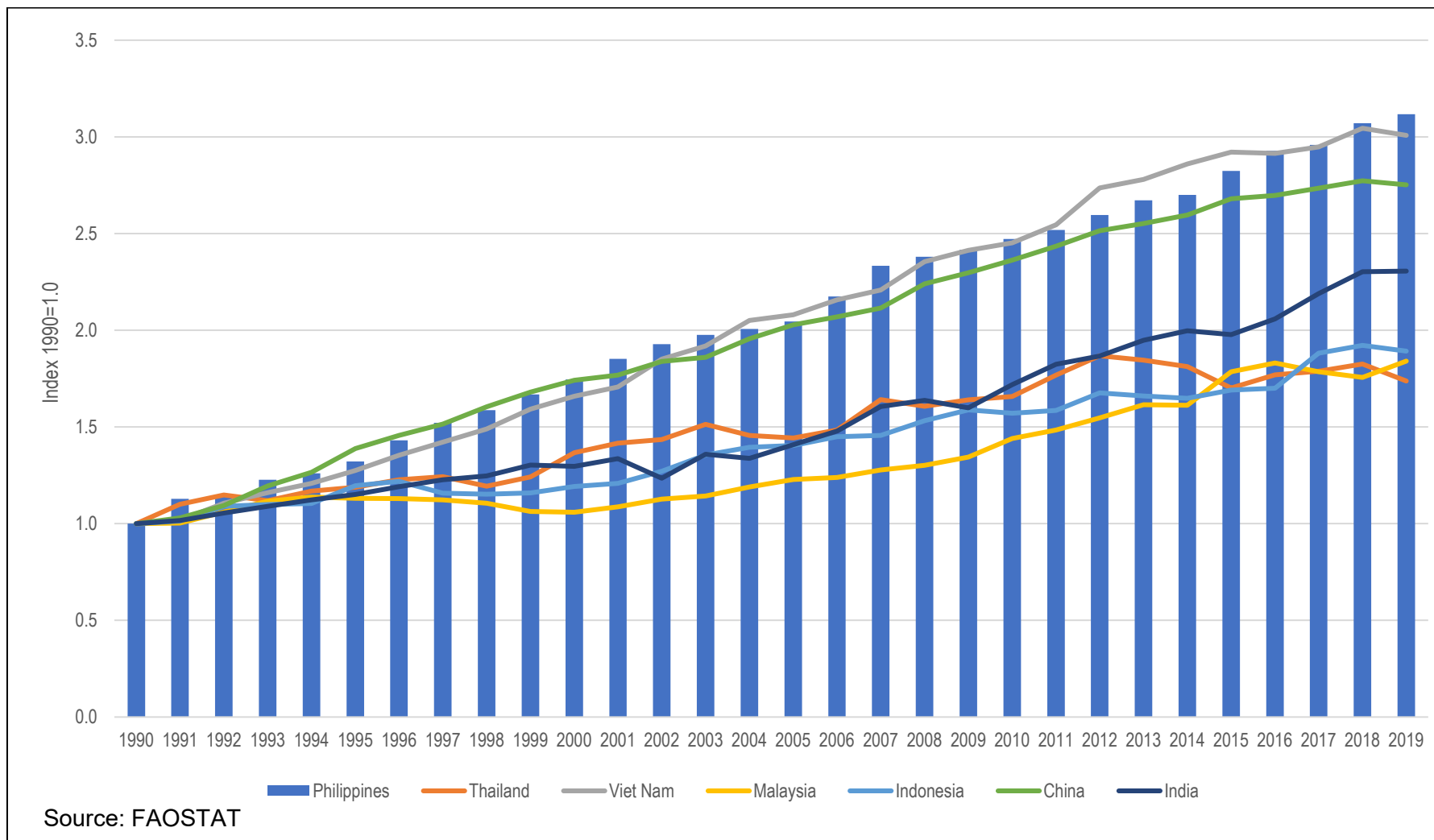


Figure 1.9: Index of Food Production in Selected Asian Countries, 1990-2019

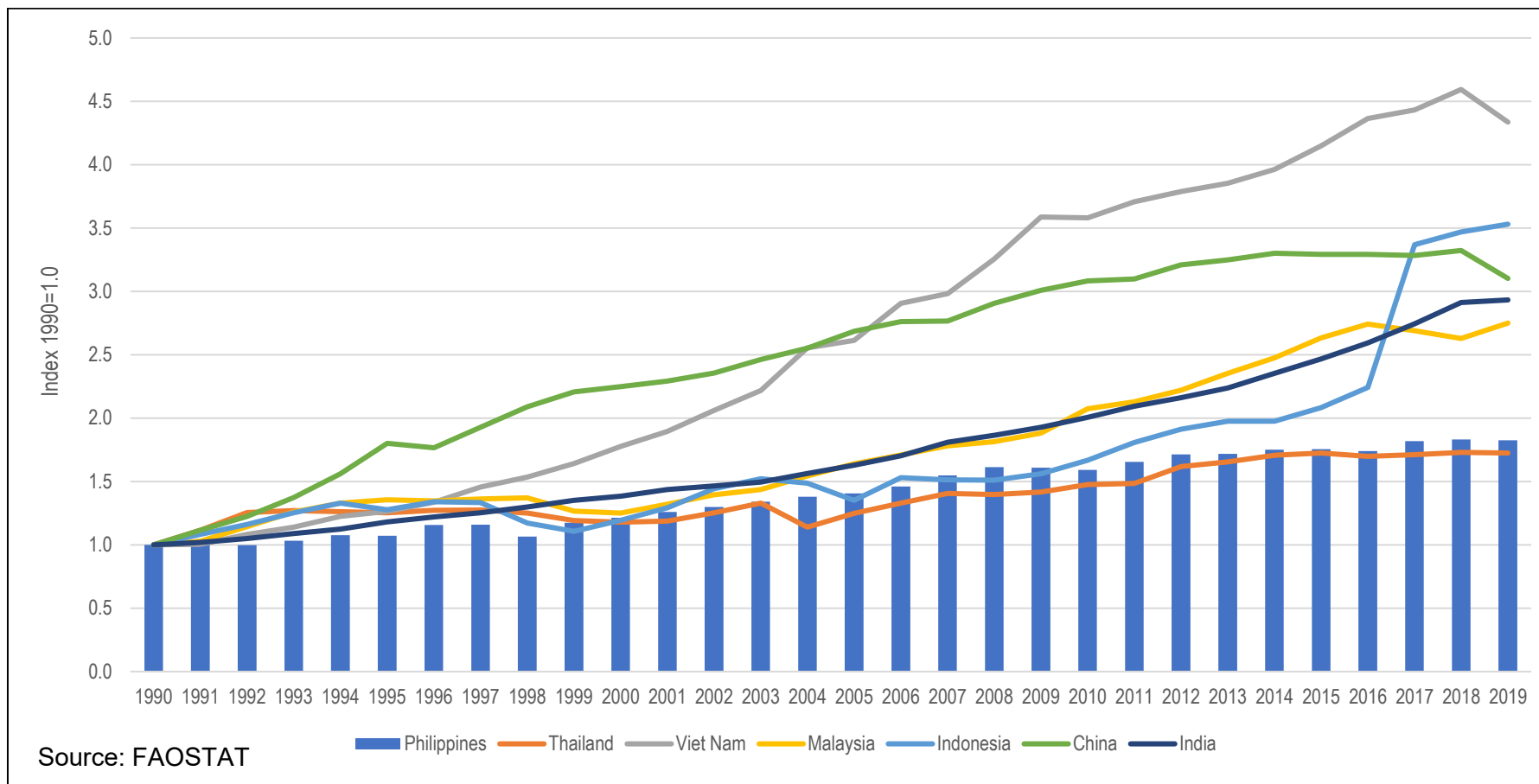
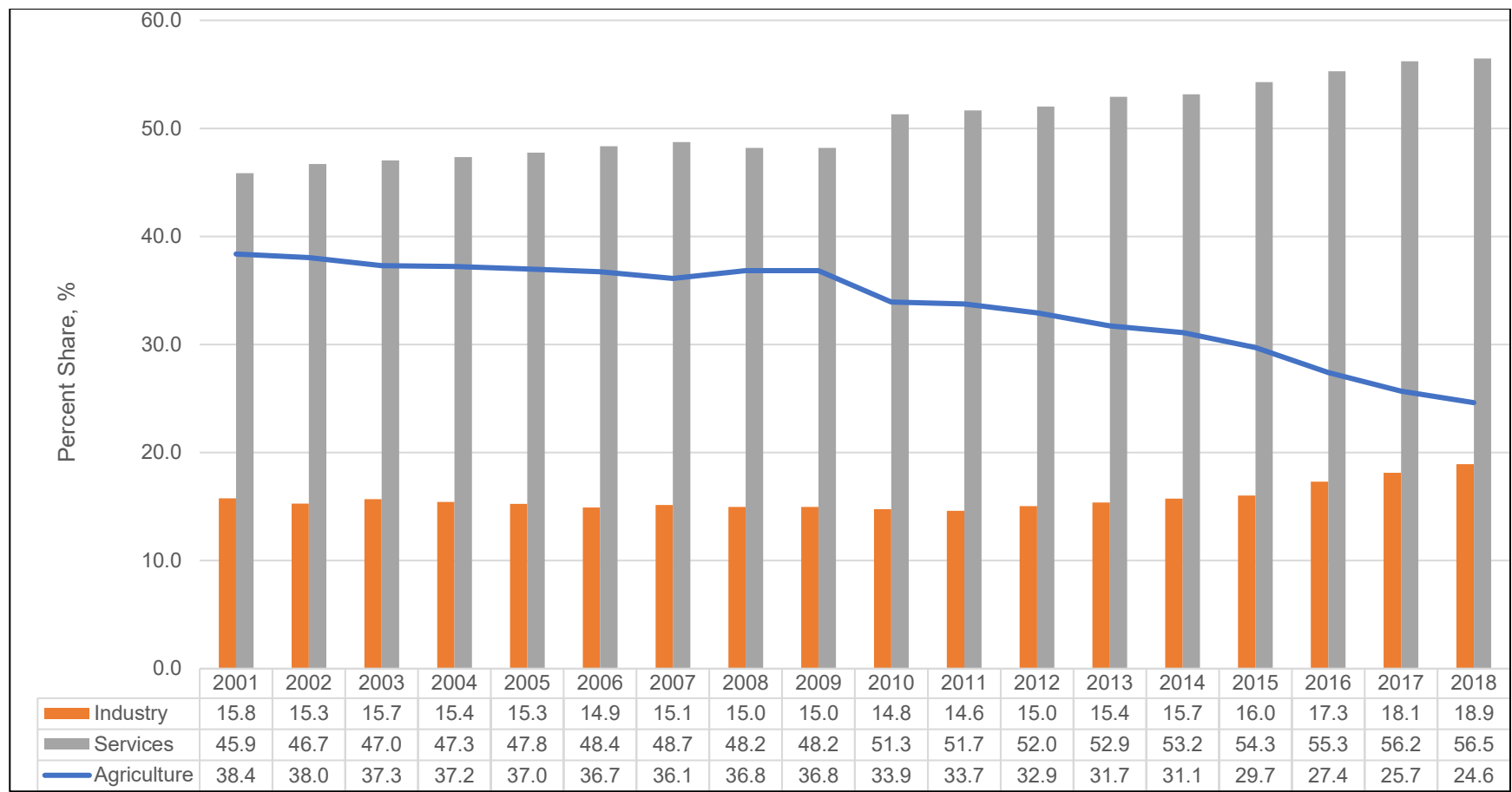


Figure 1.10: Employment in Major Sectors, % Shares



Source: Labor Force Survey, Philippine Statistical Authority

**Table 1.2: Comparative Sectoral Employment Structure (% shares)**

EMPLOYMENT	2001-2003	2008-2010	2016-2018
Agriculture, Forestry, and Fishing, including Agricultural Services	37.9	35.9	25.9
Agriculture and forestry, including Agricultural Services	33.8	31.6	23.0
Fishing	4.1	4.3	2.9
Industry	15.6	14.9	18.1
Mining and Quarrying	0.4	0.5	0.5
Manufacturing	9.6	8.9	8.5
Food products, including beverages and tobacco	2.3	2.2	2.5
Manufacture of textiles, including apparel	2.6	2.0	1.5
Electronics, computers, electronic equipment	0.8	0.9	1.1
Electricity, Steam, Water and Waste Management	0.4	0.4	0.4
Construction	5.3	5.1	8.7
Services	46.5	49.2	56.0
Wholesale and retail trade; repair of motor vehicles and motorcycles	18.2	19.2	19.7
Retail trade, except of motor vehicles and motorcycles	15.8	16.7	17.1
Transportation and storage	6.8	6.9	7.5
Land transportation	6.1	6.2	6.6
Financial and insurance activities	1.0	1.1	1.3
Professional and business services	0.2	0.3	0.9
Public administration and defense	4.5	4.6	5.8
Other service activities*	6.1	6.2	6.1

Source: Labor Force Survey, Philippine Statistical Authority

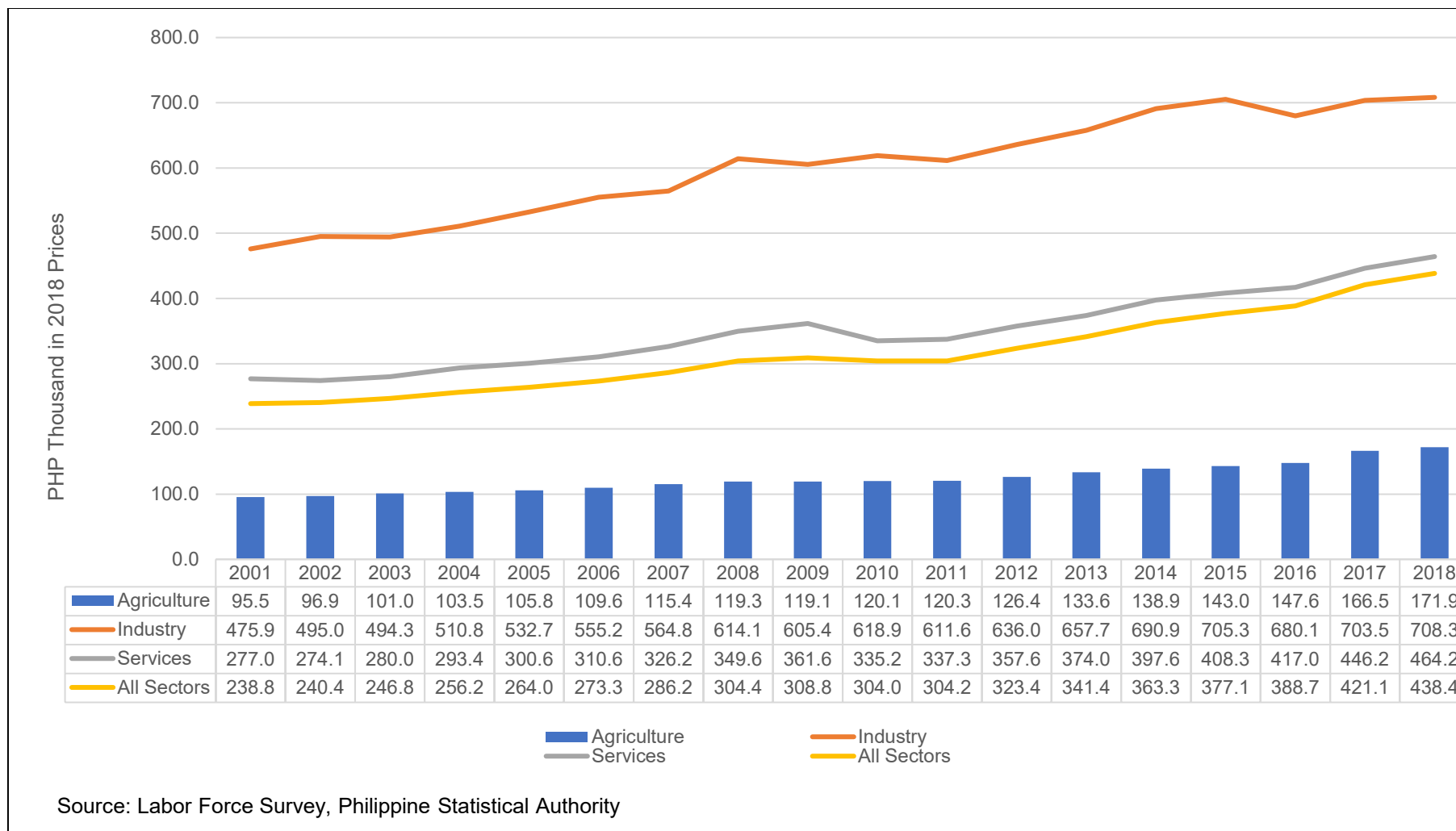
\*Other personal service activities and activities of private households with employed person

Table 1.4 presents more disaggregated sectoral employment productivity data. Agri-fisheries and forestry are among the sectors with the lowest employment productivity. In 2017-2018, the annual average employment productivity in agri-fisheries and forestry was PHP169.2 thousand in 2018 prices. This is slightly higher than the employment productivity in other household service activities, and in land transportation. Employment productivity in electricity, steam, waste, and waste management is the highest at PHP3.6 million in 2018 prices per year in 2017-2018, followed by professional and business services, financial and insurance activities and food manufacturing.

Figure 1.12 highlights the huge gap between the employment productivity in food manufacturing and agri-fisheries. Because of the lack of product diversity in agriculture (largely dominated by *palay* production) that led to low growth and declining share, the food manufacturing sector is able to sustain its growth and share by shifting its source of raw materials for processing into final/consumable food from domestic agriculture to imports. In the period 2000-2009, agriculture expanded by 3.7% per year, while food manufacturing by 4.3% per year (Figure 1.5). In the period 2010-2019, agriculture grew 1.9% per year, while food manufacturing grew by 4.3 per year.



**Figure 1.11: Employment Productivity in Major Sectors, PHP Thousand in 2018 Prices**



**Table 1.3: Annual Average Employment Productivity, PHP Thousand at 2018 Prices**

EMPLOYMENT	2002-203	2009-2010	2017-2018
Agriculture, Forestry, and Fishing	99.0	123.4	169.2
Agriculture and Forestry	99.8	121.9	166.7
Fishing	92.7	134.7	188.7
Mining and Quarrying	769.4	559.1	778.0
Manufacturing	573.0	754.6	951.4
Food products, including beverages and tobacco	1305.2	1555.1	1651.4
Manufacture of textiles, including apparel	184.8	202.2	214.8
Electronics, computers, electronic equipment	923.5	749.1	963.4
Electricity, Steam, Water and Waste Management	2236.3	2529.3	3612.2
Construction	216.9	310.7	347.2
Services	277.0	347.5	455.2
Wholesale and retail trade	242.8	296.2	387.3
Retail trade	200.6	263.1	343.8
Transportation and storage	134.6	151.2	214.5
Land transportation	95.0	89.4	125.7
Financial and insurance activities	1245.8	1939.2	2751.4
Professional and business services	2081.4	2998.5	2777.1
Public administration and defense	247.4	262.6	288.3
Other household service activities	20.5	32.3	58.6

Source: National Income Accounts and Labor Force Survey, Philippine Statistical Authority

**Sectoral educational level.** The development of the agriculture sector is characterized by the following attributes: (1) the absence of product diversity in commodities production (largely dominated by *palay* production); (2) extremely low employment productivity; (3) redundant/surplus labor; and (4) labor outmigration. It is necessary to have information on the quality of agricultural labor in terms of level of educational attainment and age, since there is significant movement of labor from agri-fisheries to services and industry. The quality of labor in agri-fisheries may indicate which sectors in services and industry where the outmigrating agricultural labor moves to. This section and the next provide comparative indicators of labor quality across sectors of the economy.

The analysis considered two levels of education of labor: (1) type 1 - no education to high school graduate; and (2) type 2 - post high school, which includes having vocational training, college, and beyond. The education levels of labor are the averages of the four rounds of the LFS.

**Figure 1.12: Employment Productivity of Agri-fisheries and Food Manufacturing, PHP Thousand 2018 Prices**

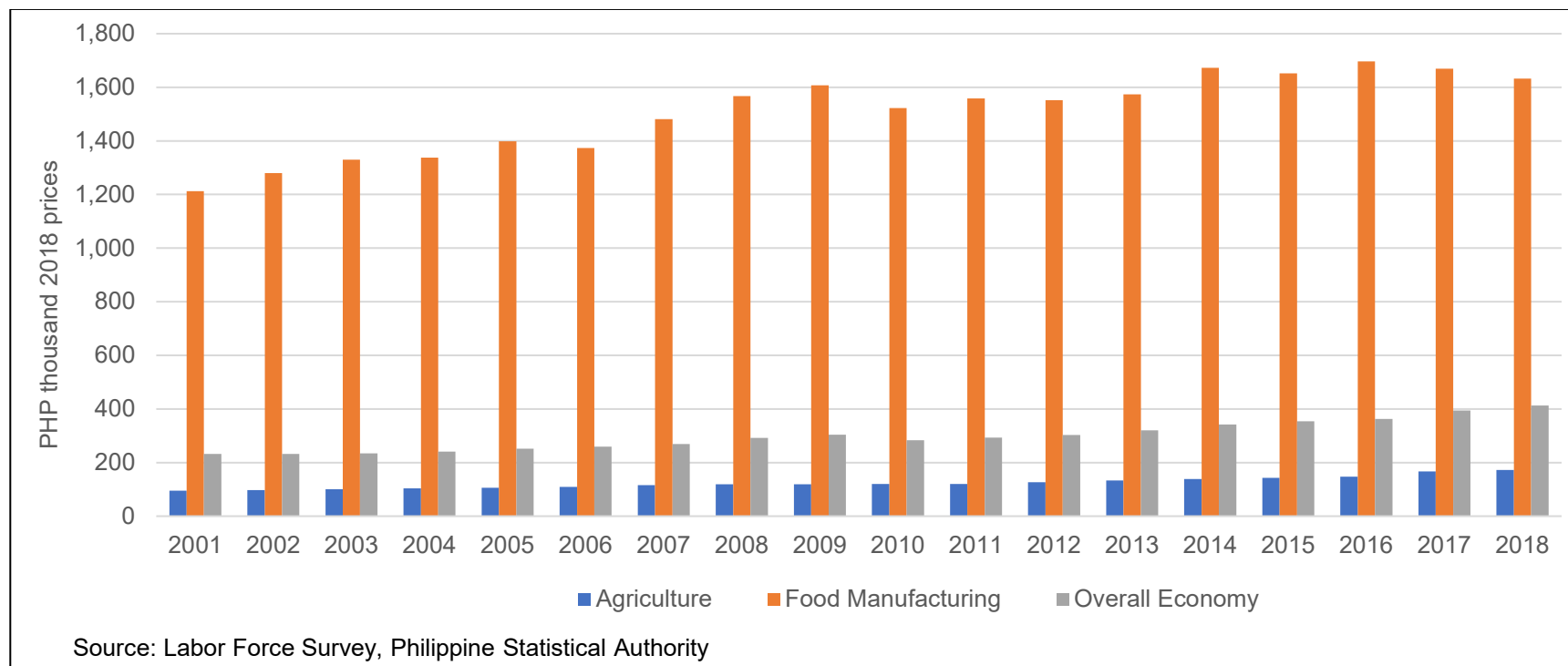


Table 1.5 presents the levels of education of labor across sectors of the economy from 2001 to 2018. On the average, the sector with the highest percentage (78.6%) with type 1 labor (no education to high school graduate) is fishing. This is followed closely by agri-fisheries and forestry (75.3%). Thus, in terms of human capital (indicated by educational attainment), agri-fisheries has the least.

The non-agri-fisheries sectors with high type 1 labor are mining (63.4%), other household services that employ persons (53.2%), and construction (52.5%). The non-agri-fisheries sectors with high type 2 labor are finance (96.9%), electronics (96.6%), professional (96.6%), utilities (84.2%), and public administration (83.5%). Based on the level of educational attainment as a measure of labor quality (types 1 and 2), agri-fisheries labor moving out of the sector may end up working in the industry and services sectors with equally low level of

**Table 1.4: Educational Structure of Sectoral Employment\***

<b>EDUCATIONAL ATTAINMENT BY SECTOR</b>	<b>2001-2002</b>	<b>2009-2010</b>	<b>2017-2018</b>
<b>Agri-fisheries</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate	78.8	75.8	71.8
Post High School	21.2	24.2	28.2
<b>Fishing</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	81.9	79.1	77.2
Post High School	18.1	20.9	22.8
<b>Mining</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	45.7	69.3	58.1
Post High School	54.3	30.7	41.9
<b>All Manufacturing</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	40.4	35.3	30.2
Post High School	59.6	64.7	69.8
<b>Food Manufacturing</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	42.6	36.5	34.3
Post High School	57.4	63.5	65.7
<b>Textile</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	47.5	39.3	32.3
Post High School	52.5	60.7	67.7
<b>Electronics</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	4.6	2.6	4.4
Post High School	95.4	97.4	95.6
<b>Utilities</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	16.9	13.5	22.2
Post High School	83.1	86.5	77.8
<b>Construction</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	55.9	51.6	52.5
Post High School	44.1	48.4	47.5
<b>Services</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	37.1	31.2	27.3
Post High School	62.9	68.8	72.7
<b>All Trade</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	44.8	37.4	33.2
Post High School	55.2	62.6	66.8
<b>Retail</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	45.9	38.1	33.9
Post High School	54.1	61.9	66.1
<b>Transportation</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

<b>EDUCATIONAL ATTAINMENT BY SECTOR</b>	<b>2001-2002</b>	<b>2009-2010</b>	<b>2017-2018</b>
No Education to Hi-School Graduate.	44.0	40.6	39.8
Post High School	56.0	59.4	60.2
<b>Land Transportation</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	44.6	41.6	41.6
Post High School	55.4	58.4	58.4
<b>Finance</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	2.8	2.9	3.4
Post High School	97.2	97.1	96.6
<b>Professional</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	5.1	3.4	2.9
Post High School	94.9	96.6	97.1
<b>Public Administration</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	18.1	16.4	15.6
Post High School	81.9	83.6	84.4
<b>Other household services</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
No Education to Hi-School Graduate.	61.1	53.6	49.0
Post High School	38.9	46.4	51.0

Source: Labor Force Survey, Philippine Statistical Authority

\*Average of 4-rounds of Labor Force Survey (January, April, July and October)

educational attainment (type 1 labor). In non-agri-fisheries sectors where labor has low level of educational attainment, the employment productivity is also low.

**Sectoral labor age structure.** Figure 1.13 presents the age structure of labor across sectors of the country. Labor in agri-fisheries is the oldest. In 2015-2018, the average age of labor in agri-fisheries is 56.6 years, the oldest. The sector with the youngest labor is food manufacturing with an average of 46.4 years.

## Philippine Agri-Fisheries Trade

This section discusses the international trade performance of the agri-fisheries and food sector. The data used in the analyses were sourced from the United Nations Comtrade (UN Comtrade). The UN Comtrade database uses harmonized system (HS) in classifying global data on exports and imports. The database disaggregates exports and imports at two-digit HS, four-digit HS and six-digit HS. The discussion in this section uses data on agri-fisheries and food (agri-food) exports and imports at two-digit HS and six-digit HS levels. Agri-fishery-food in this analysis includes HS 01 (live animals) to 24 (tobacco and manufactured tobacco substitutes) plus HS 52 (cotton).

### Agri-fisheries-Food Trade Balance

The Philippine agri-fishery-food trade balance is shown in Figure 1.14. The trade balance is consistently in deficit, i.e., the total imports of agri-fishery-food exceeded the total exports of agri-food, and the trade gap is widening.

In the period 1996-2007, the agri-fishery-food deficit trade balance was relatively small, averaging US\$ -0.7 billion per year. However, trade balance started to deteriorate starting in 2008. In 2018, the total agri-fishery-food trade imports was US\$ 14.5 billion, while the total agri-fishery-food exports was US\$ 7.5 billion. The deficit in the agri-fishery-food trade balance in 2018 increased to US\$ -7.1 billion.

Figure 1.12: Age Structure of Sectoral Labor, Average in Years

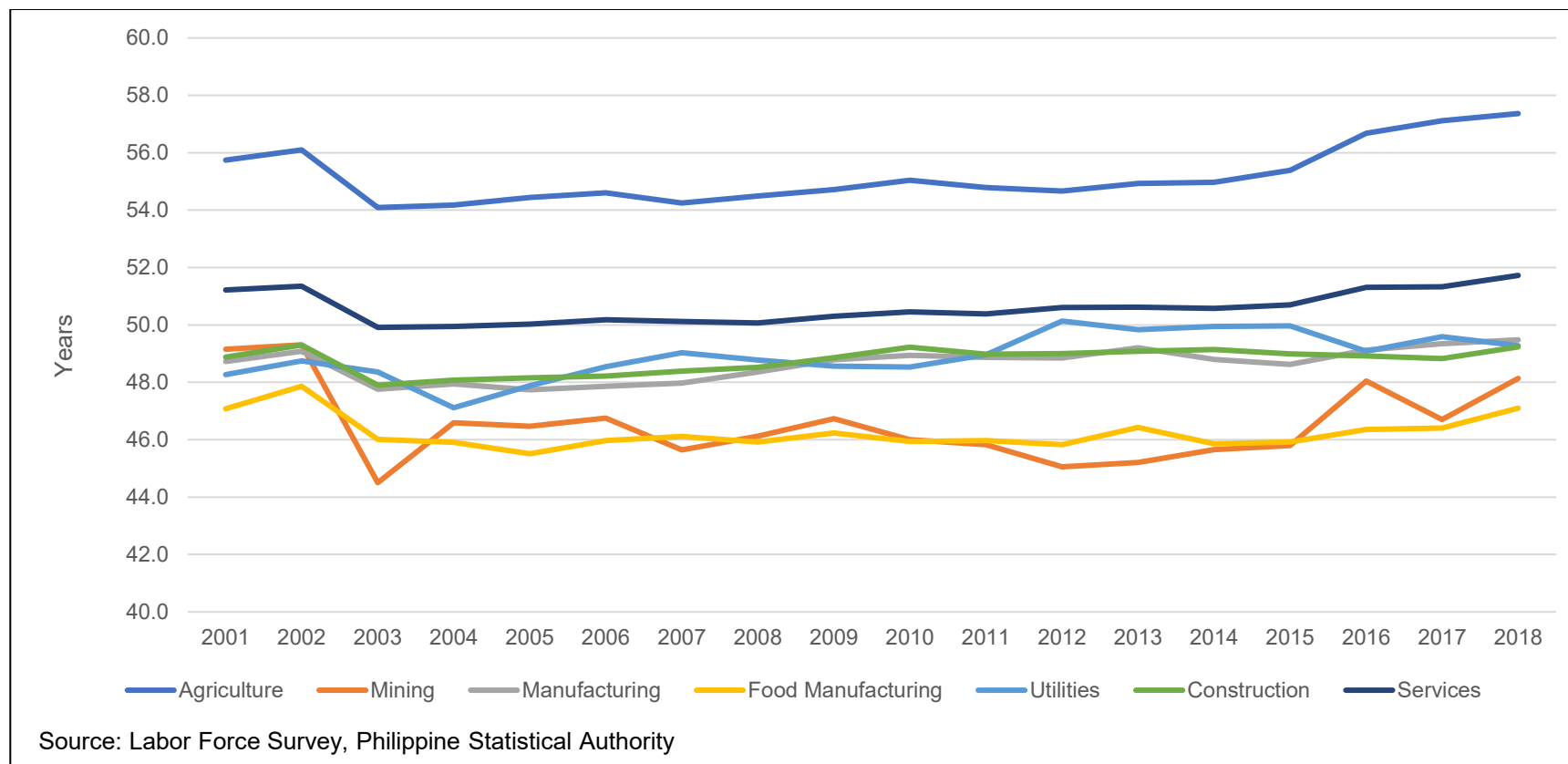
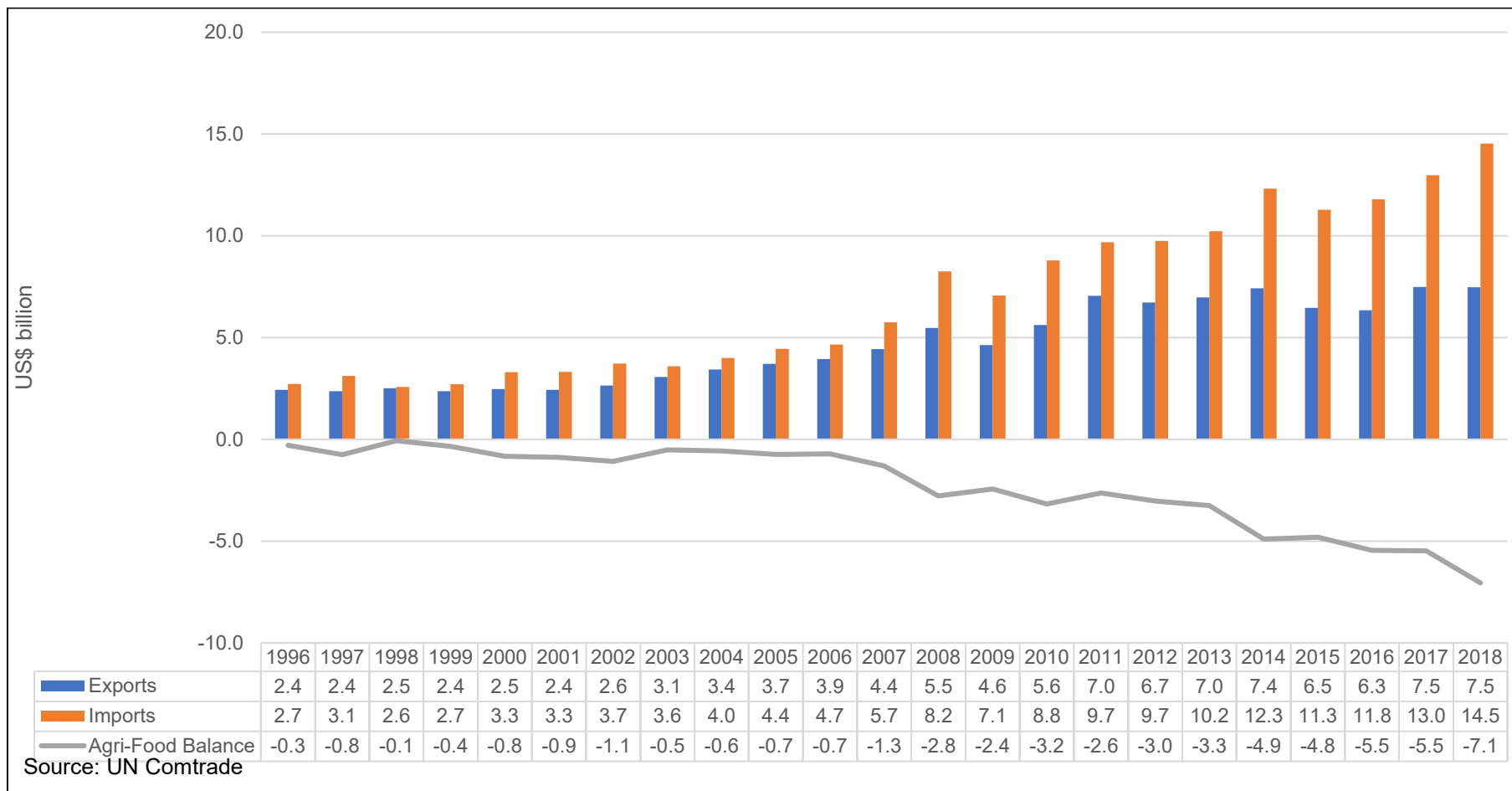


Figure 1.13: Philippine Agri-Fishery-Food Trade, 1996-2018 (US\$ Billion)

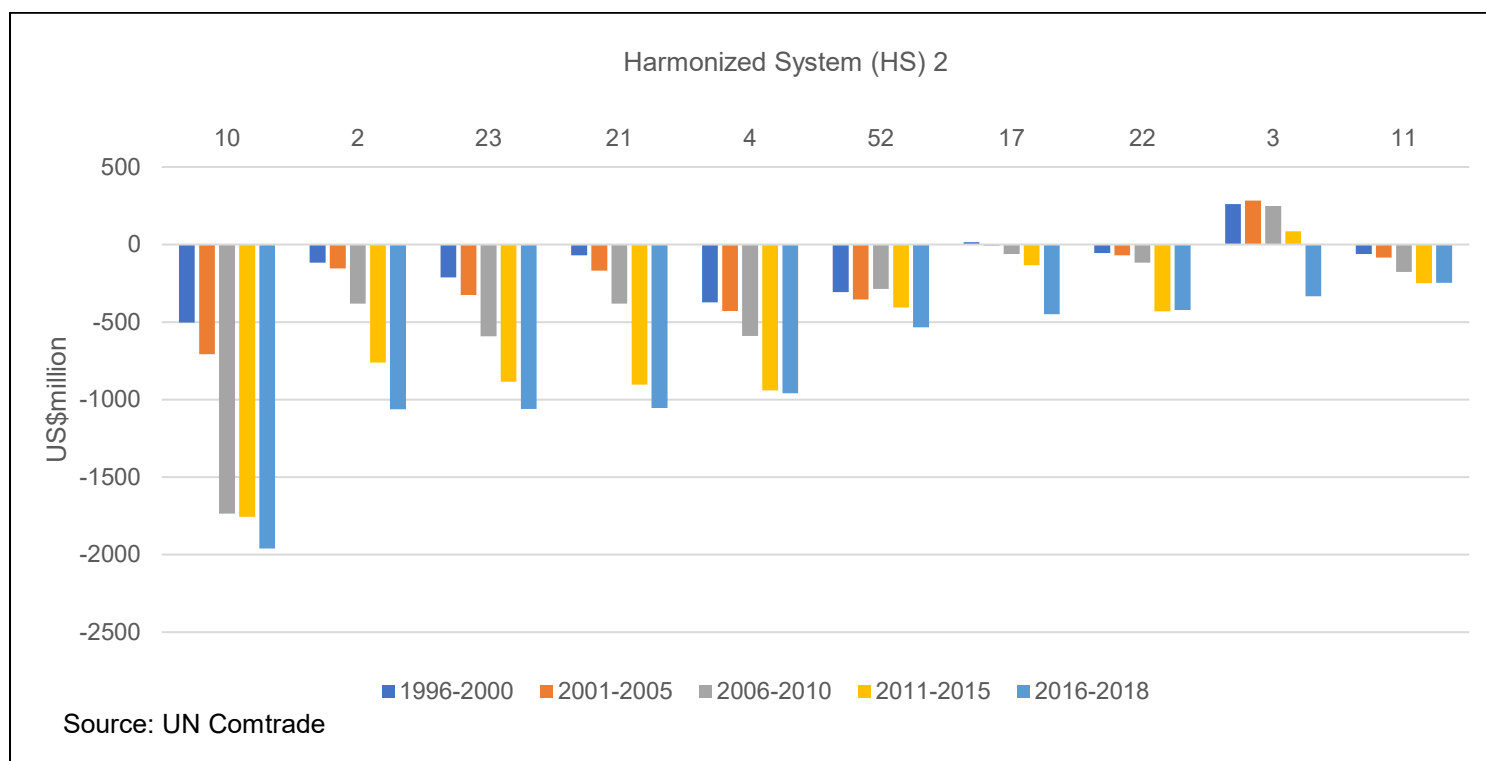


### ***Agri-Fishery-Food Imports***

Figure 1.15 shows the major commodities at two-digit HS level that contribute to the deterioration in the agri-fishery-food trade gap deficit. The largest trade gap deficit is in cereal (HS 10), which increased from the average of US\$ -504 million per year in 1996-2000 to US\$ -1,961 million per year in 2016-2018. Similar trend in trade gap deficit is observed in meat and edible meat offal (HS 02); residues and waste from the food industries, prepared animal fodder (HS23); miscellaneous edible preparations (HS 21); dairy produce, bird's eggs; natural honey, edible products of animal origin, not elsewhere specified or included (HS 04) ; cotton (HS 52); sugars and sugar confectionery (HS 17); beverages, spirits and vinegar (HS 22); and products of the milling industry, malt, starches; inulin, wheat gluten (HS 11). The trade balance of fish and crustaceans, mollusks and other aquatic invertebrates (HS 03) posted positive average trade balance 1996 and 2015, but the trend reversed in the period, 2016-2018 with a trade gap deficit of US\$ -333 million per year.



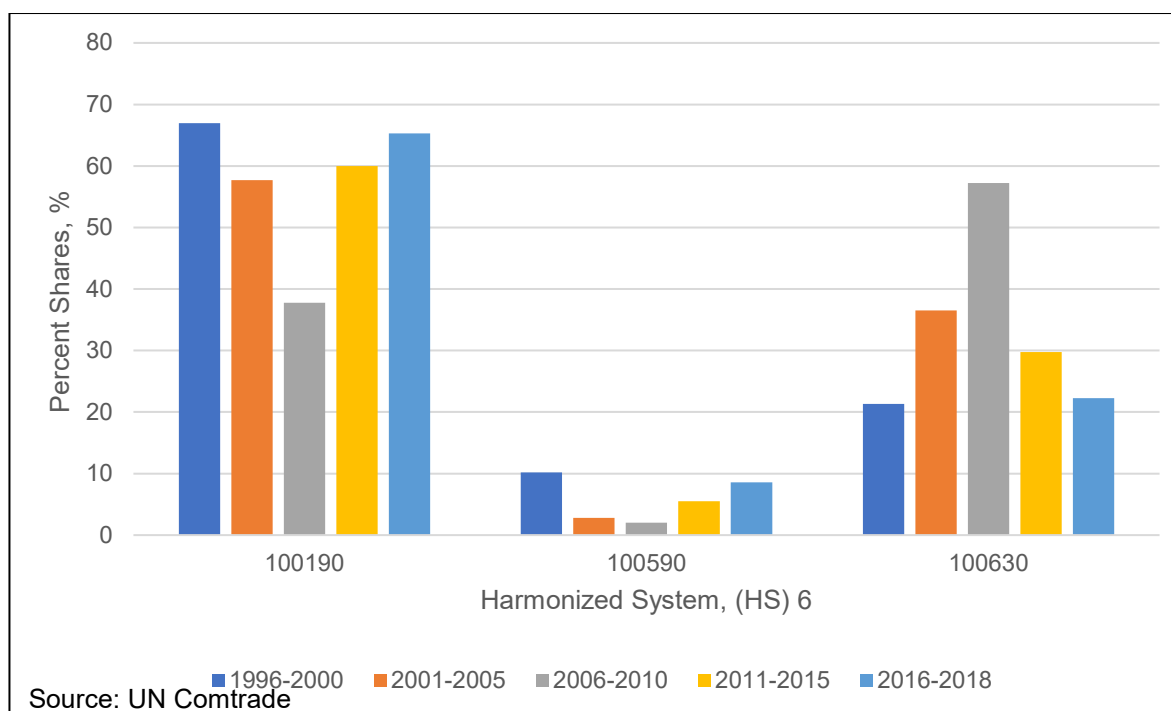
Figure 1.15: Top Commodities with Negative Agri-Fishery-Food Trade Balance, 1996-2018 (US\$ Million)



HS-2	Products
10	Cereals
02	Meat and edible meat offal
23	Residues and waste from the food industries, prepared animal fodder
21	Miscellaneous edible preparations
04	Dairy produce, bird's eggs; natural honey, edible products of animal origin, not elsewhere specified or included
52	Cotton
17	Sugars and sugar confectionery
22	Beverages, spirits and vinegar
03	Fish and crustaceans; mollusks and other aquatic invertebrates
11	Products of the milling industry, malt, starches; inulin, wheat gluten

Figure 1.16 shows the breakdown of cereal imports. The key items in cereal imports are seed of wheat and meslin (HS 100190), with more than 50% share. The other item is rice semi-milled or wholly milled, whether or not polished or glazed, parboiled (HS 100630). Its share increased from 21.3% 1996-2000 to 57.2% in 2006-2010. The surge in rice imports in 2008-2010 was due to the surge in rice imports during the 2008 food crisis. After the import surge, the share of rice imports declined. The share of yellow corn imports is small at less than 10%.

**Figure 1.16: Major Items of Agricultural Imports, HS-6 of Product 10 – Cereals, etc. (% Shares)**



HS-6	Products
100190	Seed of wheat and meslin
100590	Yellow dent corn
100630	Rice semi-milled or wholly milled, whether or not polished or glazed, parboiled

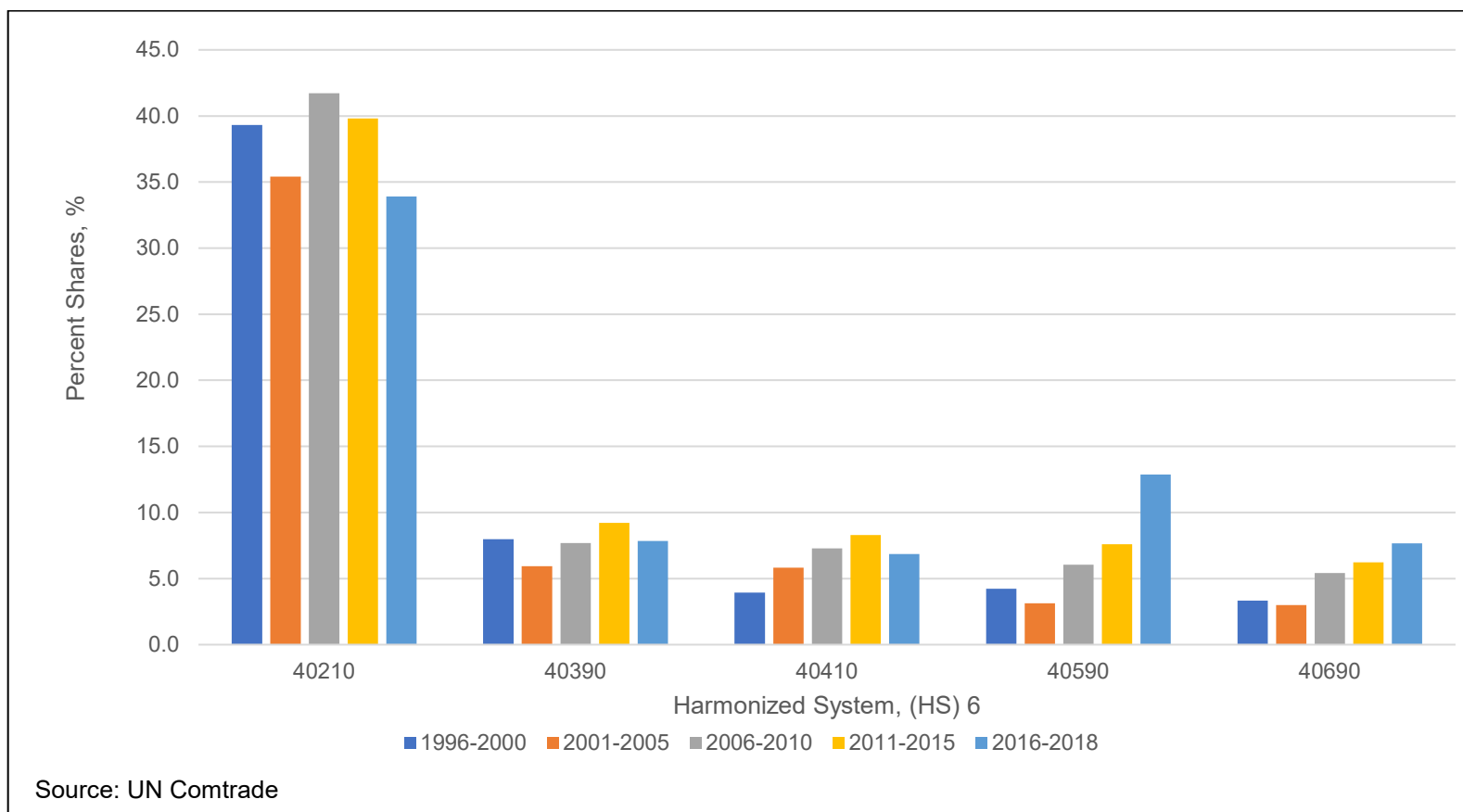
Figure 1.17 presents the breakdown of dairy imports. Of the total dairy imports, more than 30% is milk and cream, concentrated or sweetened, in powder, granules or other solid forms, w/fat content (HS 040210). The other item with increasing share is fats and oils derived from milk, other than butter or dairy spreads (HS 040590).

There is only one major import item under HS 23 (residue and waste from food industry), which is oilcake and other solid residues, resulting from the extraction of soybean oil (HS 230400). Its share is more than 80% of the total as shown in Figure 1.18.

### Agri-Fishery-Food Exports

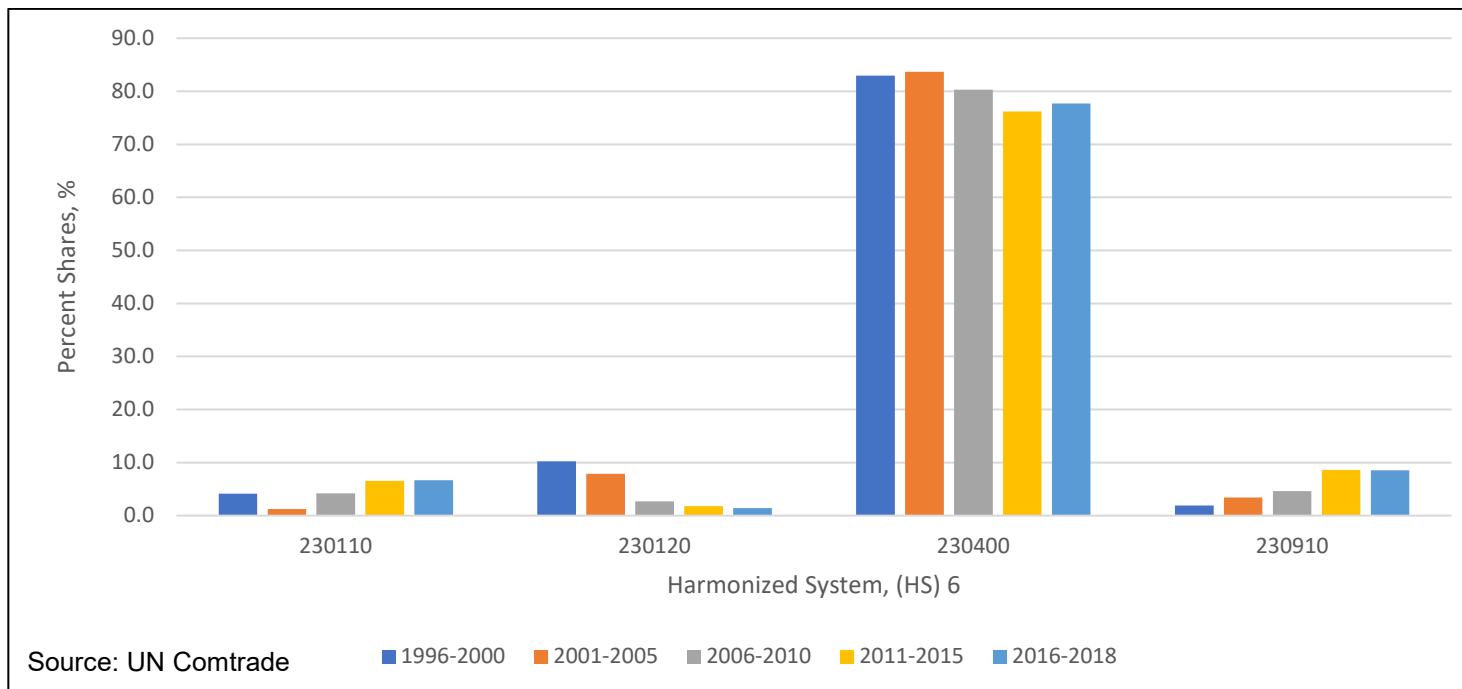
Figure 1.19 shows the major agri-fishery-food exports of the Philippines at two-digit HS. Exports of edible fruit and nuts, peel of citrus fruits or melons (HS 08) have increased over time from 25.9% of total exports in 1996-2000 to 33.6% in 2016-2018. Exports of animal or vegetable fats and oils and their cleavage products, prepared edible fats, animal or vegetable waxes (HS 15) have improved as well from 17.5% share in 2001-2005 to 20.3% in 2016-2018.

Figure 1.17: Major Items of Agricultural Imports, HS-6 of Product 04 – Dairy etc. (% Shares)



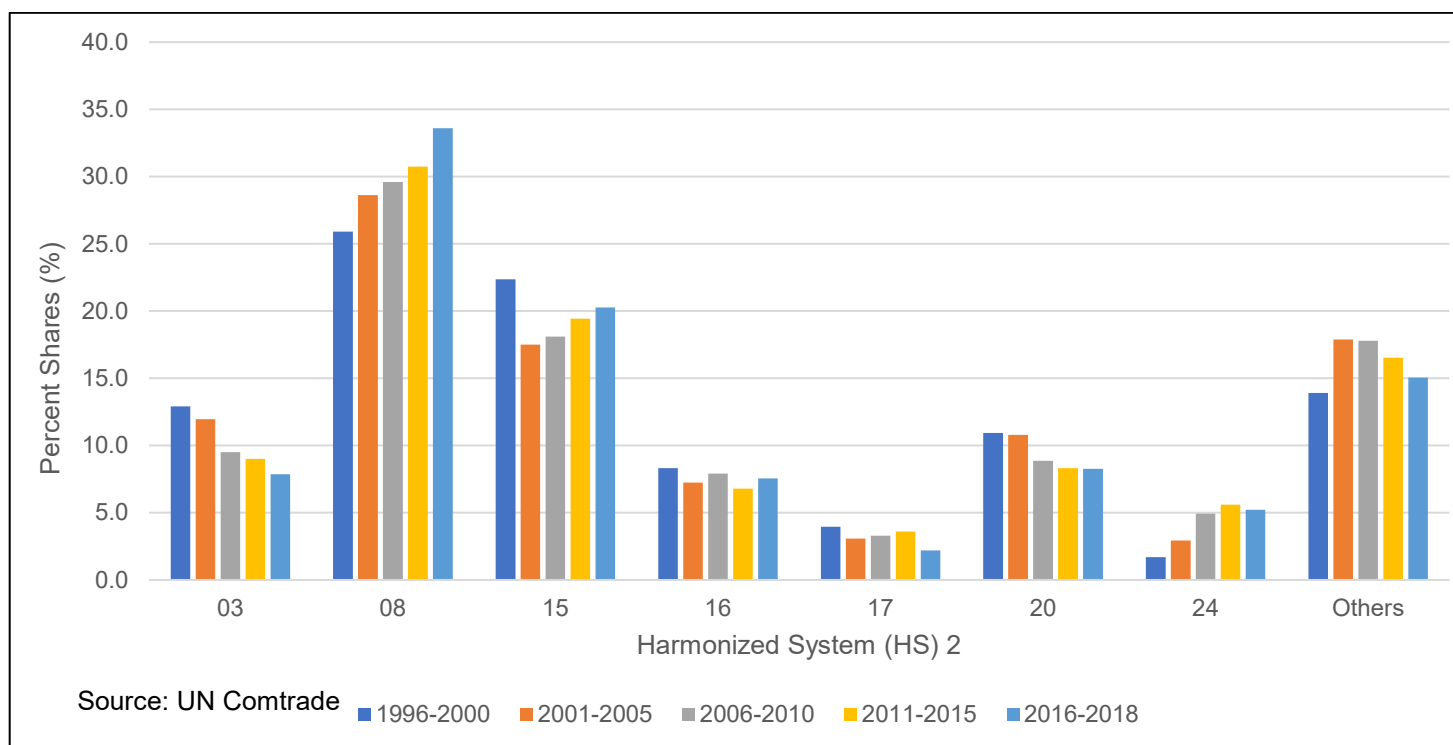
HS-6	Products
40210	Milk and cream, concentrated or sweetened, in powder, granules or other solid forms, with fat content
40390	Sourcream, fluid
40410	Whey protein concentrates
40590	Fats and oils derived from milk, other than butter or dairy spreads
40690	Bryndza cheese, not grated or powdered, not processed

**Figure 1.18: Major Items of Agricultural Imports, HS-6 of Product 23 – Residue and Waste from Food Industries. (% Shares)**



HS-6	Products
230110	Flours, meals, and pellets, of meat or meat offal unfit for human consumption; greaves (cracklings)
230120	Flours, meals, and pellets, of fish or of crustaceans, mollusks or other aquatic invertebrates, unfit for human consumption
230400	Oilcake and other solid residues, resulting from the extraction of soybean oil
230910	Dog or cat food, put up for retail sale

Figure 1.19: Composition of Philippine Agri-Fishery-Food Exports, (% Shares)



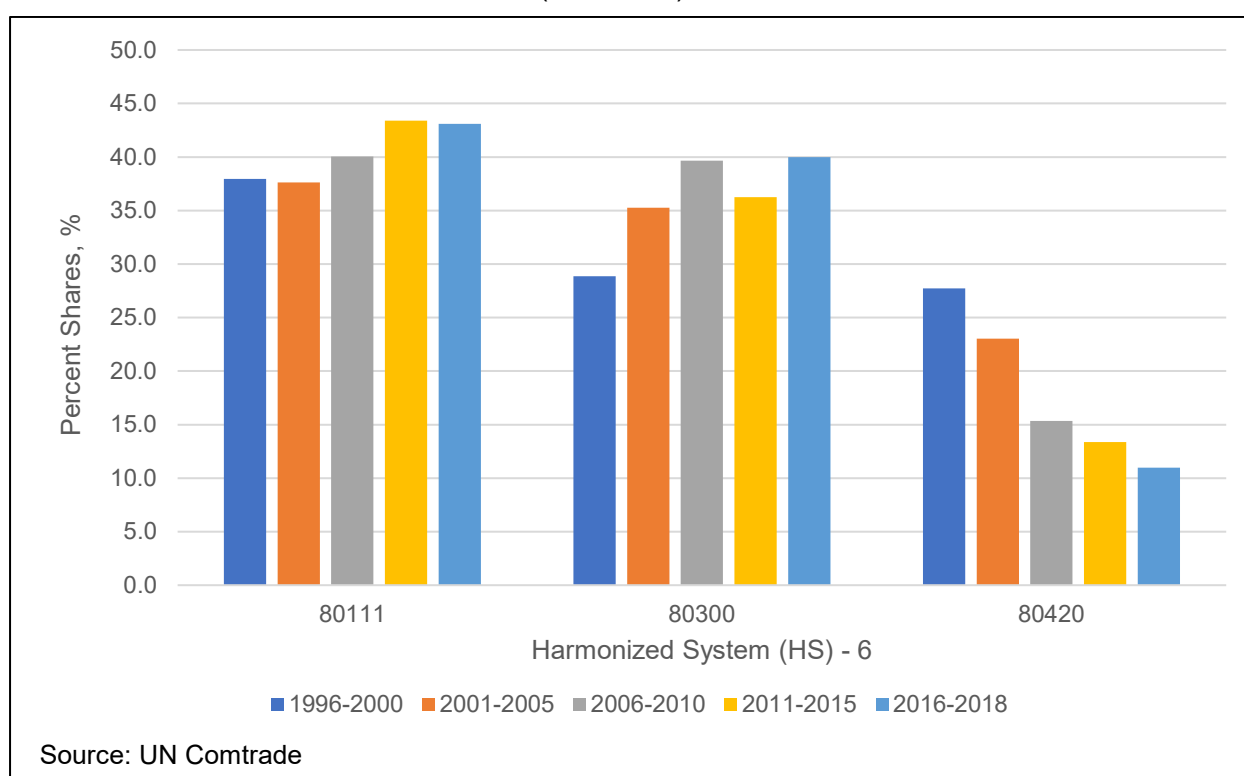
HS-2	Products
03	Fish and crustaceans, mollusks and other aquatic invertebrates
08	Edible fruit and nuts; peel of citrus fruits or melons
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
16	Preparations of meat, of fish or of crustaceans, mollusks or other aquatic invertebrates
17	Sugar and sugar confectionery
20	Preparations of vegetable fruit, nuts or other parts of plants
24	Tobacco and manufactured tobacco substitutes
Others	ALL OTHERS

However, exports of fish and crustaceans, mollusks and other aquatic invertebrates (HS 03) have dropped from 12.9% share in 1996-2000 to 7.9% in 2016-2018.

Figure 1.20 shows the key items of exports of edible fruits at six-digit HS. Exports of coconut (desiccated) (HS 080111) dominate exports of edible fruits. The export share of these commodities increased from 38% share in 1996-2000 to 43.1% in 2016-2018 (5 percentage points improvement over the

period). Exports of bananas, fresh or dried (HS 080300) have also improved from 28.9% share in 1996-2000 to 40% in 2016-2018 (11.1 percentage points over the period).

**Figure 1.20: Major Items of Agricultural Exports, HS-6 of Product 08 - Fruits, etc. (% Shares)**

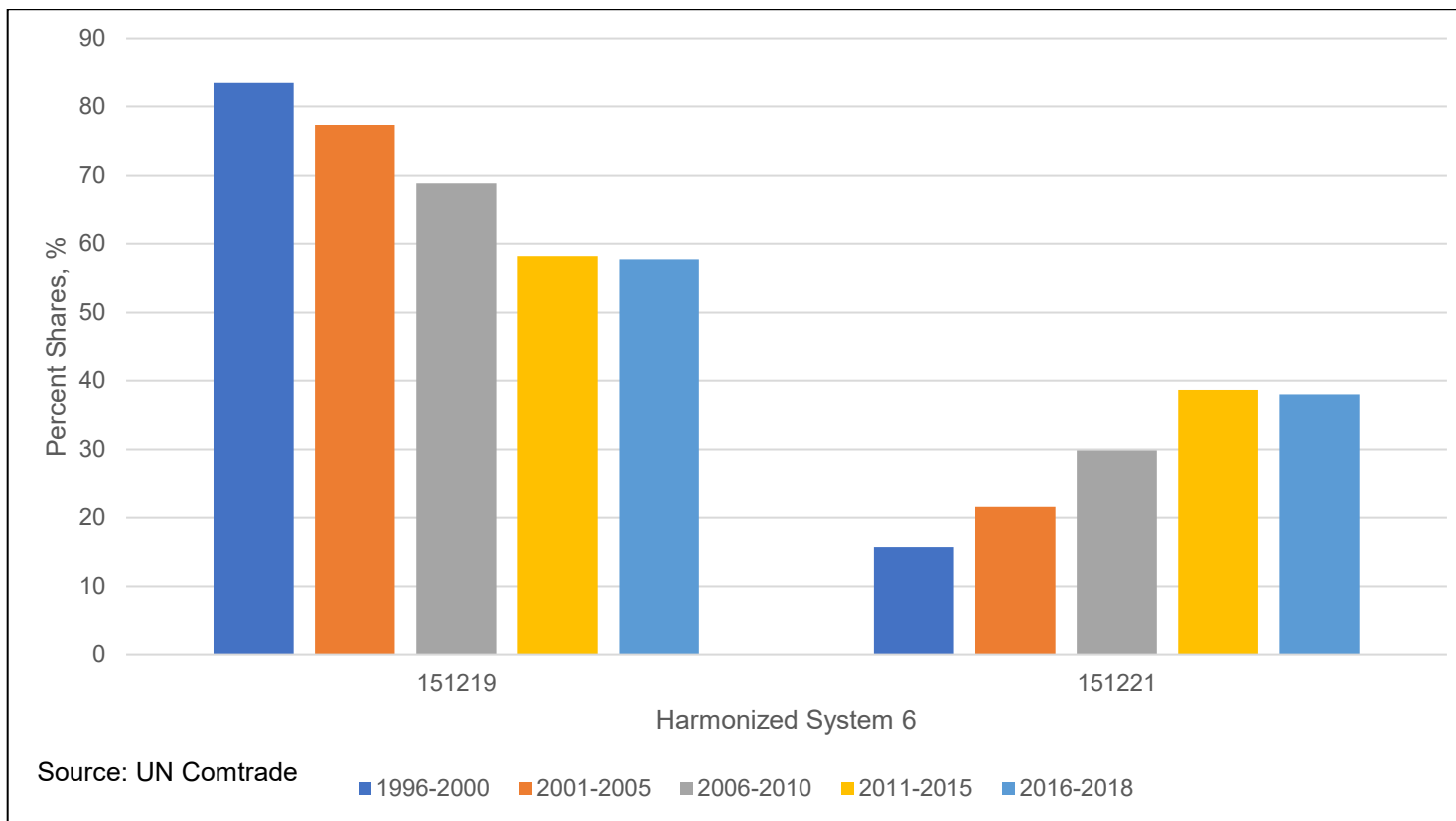


HS-6	Products
80111	Coconuts, desiccated
80300	Bananas, fresh or dried
80420	Figs, fresh or dried, whole, in units weighing more than 0.5 kg each

Figure 1.21 shows the major commodities in animal or vegetable fats and oil at six-digit HS. Of the total export of oil fats in 1996-2000, more than 80% is sunflower seed or safflower oil, other than crude, and their fractions, whether or not refined, but not chemically modified (HS 151219). The share dropped to 58% in 2016-2018. An opposite trend is observed in the export of cottonseed oil, crude, and its fractions, whether or not gossypol has been removed (HS 151221), with its share increasing from 16% in 1996-2000 to 38% in 2016-2018.

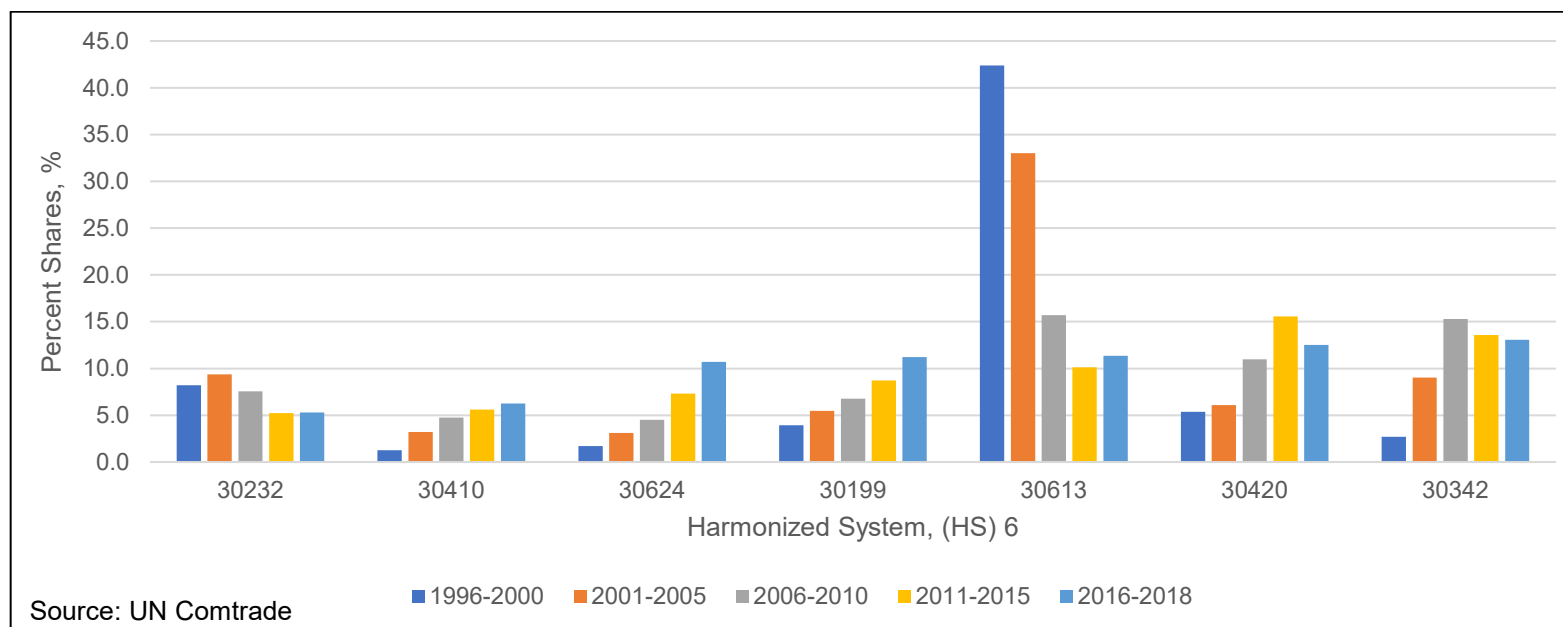
Figure 1.22 presents a breakdown of exports of fish and related products at six-digit HS. Exports of fish and crustaceans; the significant drop in the share of shrimps and prawns, cooked in shell or uncooked, dried, salted or in brine, frozen (HS 30613) dropped from 42.4% share in 1996-2000 to 11.3% share in 2016-2018 (31.1 percentage points decline). Tuna-related exports comprise two categories: yellowfin tunas, fresh or chilled, excluding fillets, other

Figure 1.21: Major Items of Agricultural Exports, HS-6 of Product 15 - Fats (% Shares)



HS-6	Products
151219	Sunflower seed or safflower oil, other than crude, and their fractions, whether or not refined, but not chemically modified
151221	Cottonseed oil, crude, and its fractions, whether or not gossypol has been removed

Figure 1.22: Major Items of Fisheries Exports, HS-6 of Product 03 - Fish, etc. (% Shares)



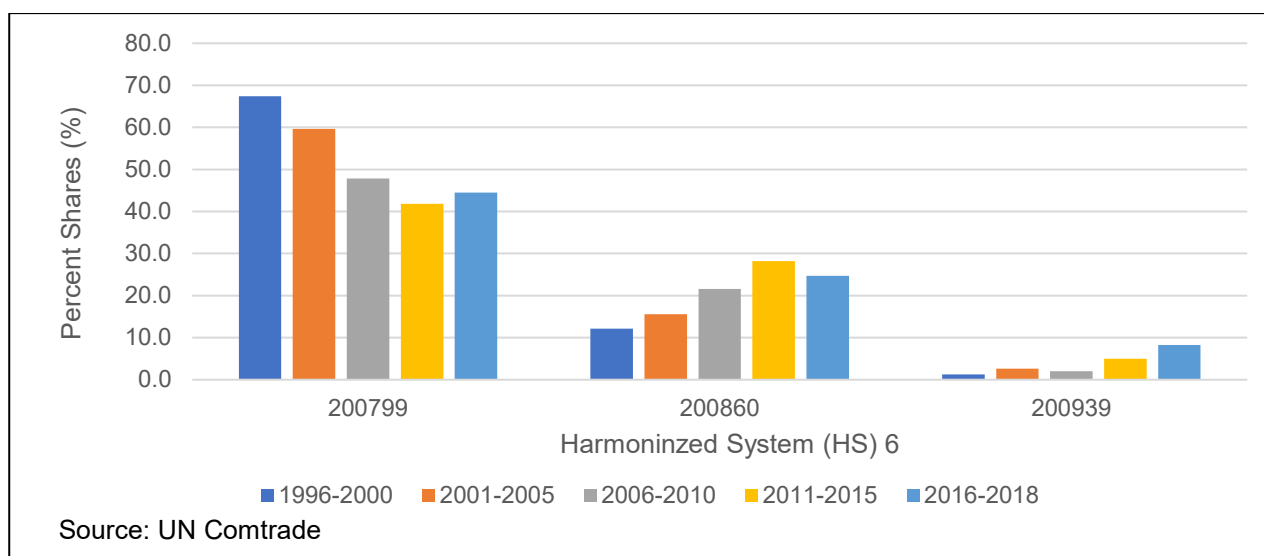
HS-6	Products
30232	Yellowfin tunas, fresh or chilled, excluding fillets, other meat portions, livers and roes
30410	Cod, cusk, haddock, pollock, Atlantic Ocean perch, filleted or minced, fresh or chilled
30624	Crabmeat, not frozen
30199	Live fish, other than trout, eel, carp or ornamental fish
30613	Shrimps and prawns, cooked in shell or uncooked, dried, salted or in brine, frozen
30420	Frozen fish fillets, skinned, in blocks weighing over 4.5 kg, to be minced, ground or cut into pieces of uniform weight and dimension
30342	Yellowfin tunas, frozen, excluding fillets, other meat portions, livers and roes



meat portions, livers and roes (HS 30232); and yellowfin tunas, frozen, excluding fillets, other meat portions, livers and roes (HS 30342). The combined share of these tuna-related exports to total fish-related exports increased from 10.1 in 1996-2000 to 18.4% in 2016-2018 (8.3 percentage points increase).

Major items under fruit preparations (HS 20) at six-digit HS include lingonberry and raspberry jams (HS 200799) and cherries, otherwise prepared or preserved (HS 200860). Figure 1.23 shows the share of HS 200799 dropped from 67.4% in 1996-2000 to 45.5% in 2016-2018, while the share of HS 200860 increased from 12.1 in 1996-2000 to 24.7% in 2016-2018.

**Figure 1.23: Major Items of Agricultural Exports, HS-6 of Product 20 - Fruit Preparations, etc. (% Shares)**



HS-6	Products
200799	Lingonberry and raspberry jams
200860	Cherries, otherwise prepared or preserved
200939	Lime juice, of a Brix value exceeding 20, unfit for beverage purposes, unfermented

### Agri-Fishery-Food Philippine Trading Partners

Figure 1.24 shows the destinations of Philippine agri-fishery-food exports. The United States and Japan are the largest markets for Philippine agri-fishery-food exports. However, their combined shares dropped from the average 56.8% in 1996-2000 (United States 29.4% and Japan 27.4%) to the average 36.8% (United States 21.1% and Japan 15.7%). The total share of these markets dropped 20 percentage points over the period. Another key market for Philippine agri-fishery-food exports is the European Union, with an average market share of 18.7% in 2016-2018. The markets in ASEAN, China, South Korea and “all others” are growing markets for Philippine agri-food exports.

Figure 1.25 shows the key sources of Philippine agri-food imports. The major sources of imports are ASEAN and the United States with a combined share of almost 50%. China is rapidly becoming major source of the country’s agri-food imports. Imports from the European Union are about 10% shares, dropped from the average 56.8% in 1996-2000 (United States 29.4% and Japan 27.4%) to the average 36.8% (United States 21.1% and Japan 15.7%). The

Figure 1.24: Destinations of Philippine Exports of Agri-Fishery-Food, 1996-2018

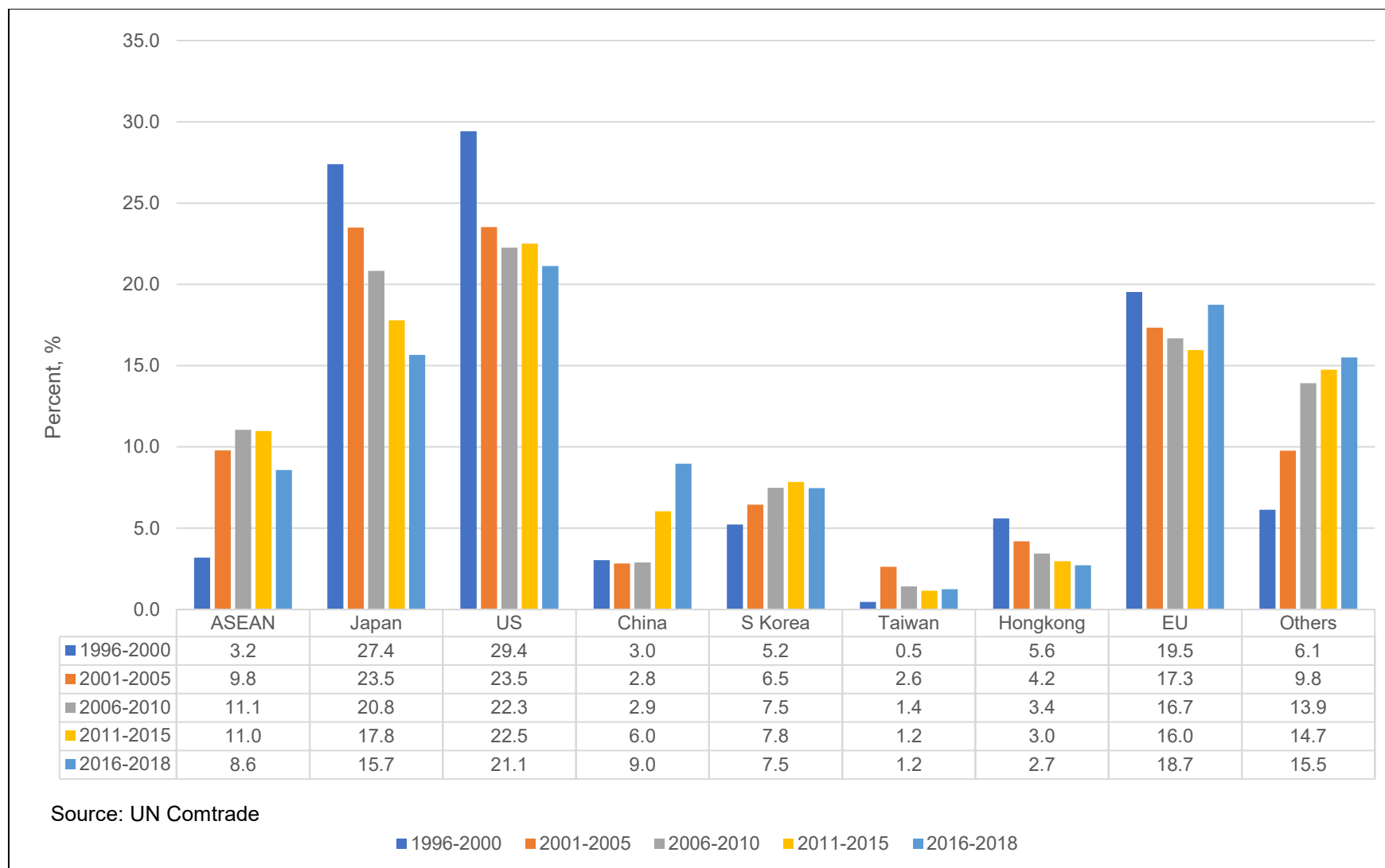
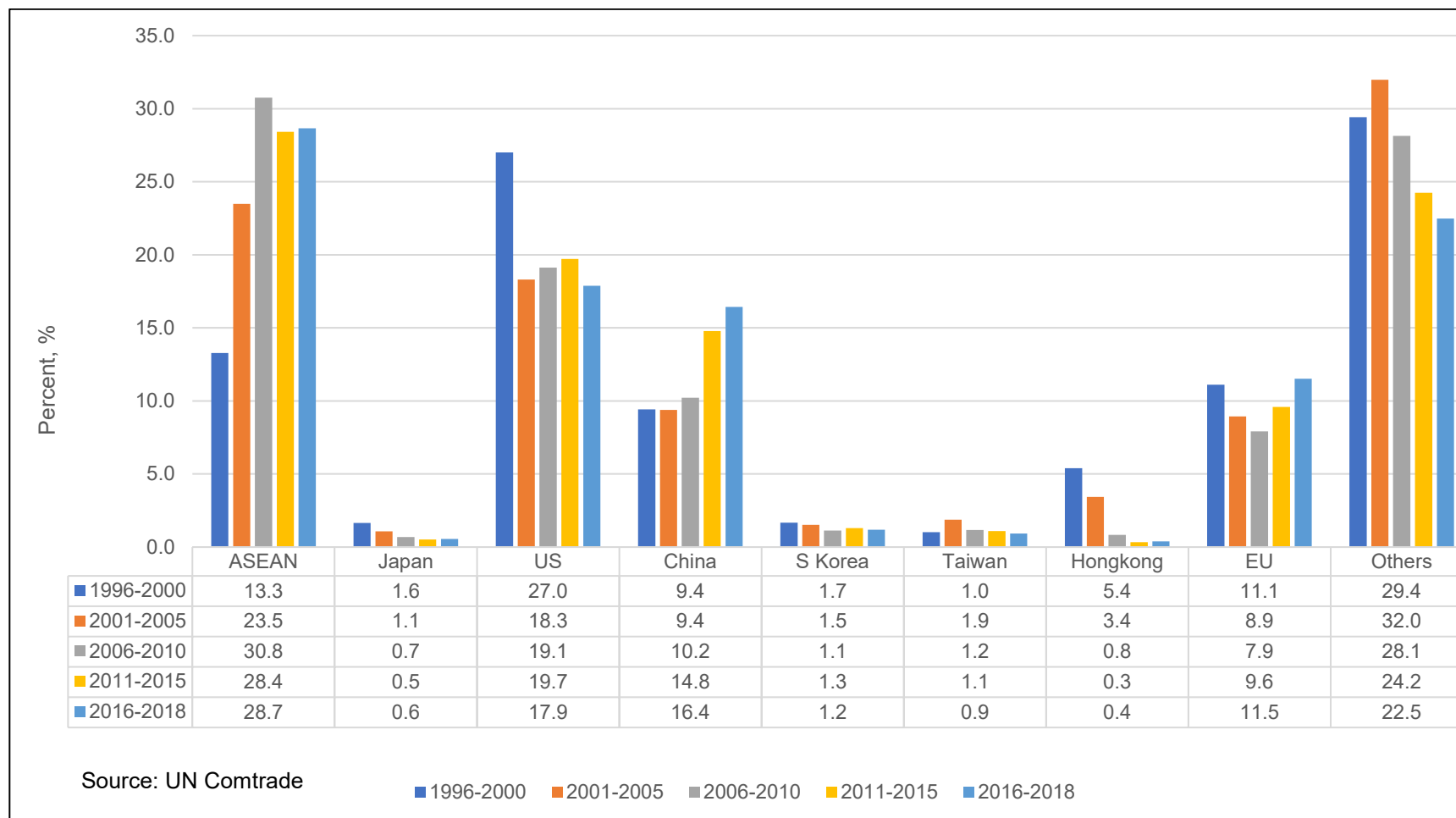


Figure 1.25: Sources of Philippine Agri-Fishery-Food Imports, 1996-2018



total share of these markets dropped 20 percentage points over the period. Another key market for Philippine agri-food exports is the European Union, with an average market share of 18.7% in 2016-2018. The markets in ASEAN, China, South Korea and “all others” are growing markets for Philippine agri-food exports.

## Support to Philippine Agri-Fisheries

This section discusses the support to agricultural production in the Philippines based on the dataset developed by the Organization for Economic Co-operation and Development (OECD). The dataset covers (1) market price support; (2) budgetary support; and (3) general services support to agri-fisheries.

The market price support (MPS) is computed as the price gap between the external reference price and the average producer price plus marketing margins. The average producer price which is sourced from the Philippine Statistics Authority (PSA), is the price received by producers i.e., farmgate prices. The source of the external reference price varies depending upon the commodity. For example, the external price for rice is the milled rice export price quotes of Vietnam, adjusted to the Philippine border. The average export unit value of crude coconut (copra) oil at the border in the Philippines is used for coconut. The average export unit value of centrifugal sugar at the border in the Philippines is applied for sugar.

The marketing margins include processing, handling and transportation costs for a given agricultural product. For example, for some products, the margin is the difference between the average farmgate price and the wholesale market price.

In the estimation of MPS, the following crops are covered: rice, maize, coconut, banana, sugarcane (centrifugal), mango, and pineapple. For meat and animal products, the following commodities are included: beef and veal, pork, poultry and egg. On the average, these 11 food items comprise about 90% of the total value of gross output of agri-fisheries. The seven crops capture 76% of total value of crop production, while four meat products 94% of the total animal production. Thus, based on the product coverage in the OECD database, the bulk of agricultural production in the Philippines is largely covered.

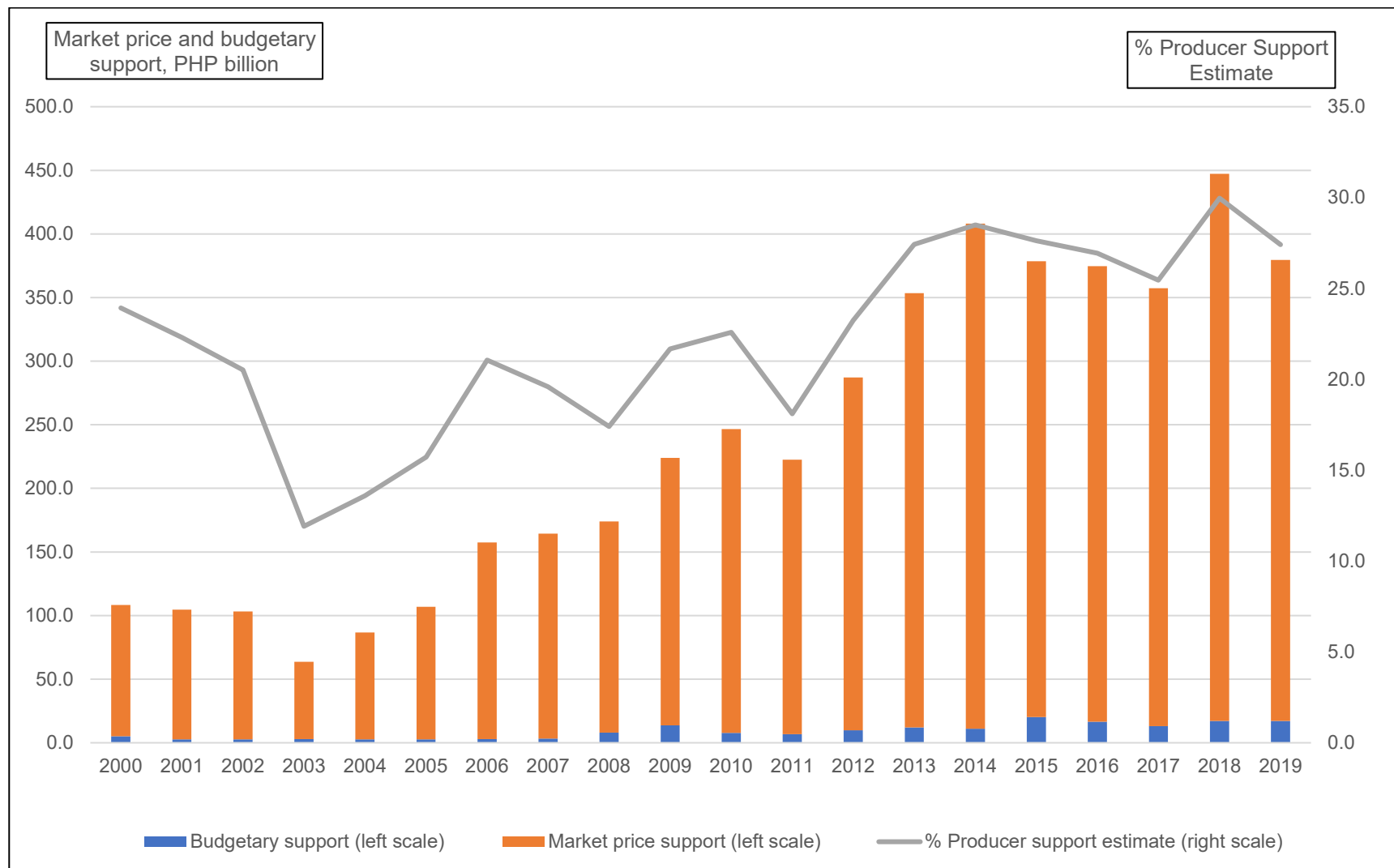
The information on budgetary support for agricultural production is based on the data from the Department of Agriculture (DA) and the Department of Budget and Management. The budgetary support covers expenditure undertaken by DA, Department of Agrarian Reform (DAR), and various government-owned-and-controlled-corporations (GOCCs).

Lastly, the general services support includes expenditures on agricultural research and development, training, inspection, marketing and promotion, and public stockholding.

Figure 1.26 shows that the support to agricultural production increased considerably from 2000 to 2019. Table 1.5 indicates that the average total producer support estimate (PSE) increased from PHP105.4 billion per year in 2000-2002 to PHP214.9 billion per year in 2008-2010 and to PHP394.7 billion per year in 2017-19. As a percentage of the total value of production valued at farmgate prices, in the past 10 years the total average PSE increased from 20.6% in 2008-2010 to 27.6% 2017-2019.

The growth of PSE and components expanded rapidly over the years relative to the increase in general prices. For example, the average total PSE increased by 103.8% between the periods 2000-2002 and 2008-2010. During the same period, the MPS increased by 101.1%,

Figure 1.26: Level and Composition of Producer Support Estimate, 2000-2019



Source: Organization for Economic Co-operation and Development (OECD) Food and Agriculture Review

**Table 1.5: Producer Support Estimate, 2000-2019**

VARIABLE	2000-2002	2008-2010	2017-2019
Producer Support Estimate (PSE), PHP billion /1	105.4	214.9	394.7
Market Price Support (MPS), PHP billion /1	101.9	205.0	378.9
Budgetary support, PHP billion /1	3.5	9.9	15.8
Percentage PSE (%) /1	23.9	20.6	27.6
<b>PERIOD GROWTH, %</b>		<b>(2008-2010)/ (2000-2002)</b>	<b>(2017-2019)/ (2008-2010)</b>
Producer Support Estimate (PSE), %		103.8	83.7
Market Price Support (MPS), %		101.1	84.8
Budgetary support, %		182.7	59.8
Consumer prices, %		44.7	0.3
IPI GDP, % /2		45.4	22.4

Source: OECD Food and Agriculture Reviews, and PSA

/1 Period average

/2 IPI GDP - Implicit Price Index GDP

while the budgetary support went up by 182.7%. The rapid growth in PSE during the period far exceeded the increase in the general price. The average consumer prices increased by only 44.7% while the implicit price index (IPI) for gross domestic product (GDP) expanded by 45.4%.

While the rate of increase in the support to agri-fisheries decelerated in the period 2017-2019 relative 2008-2010, the expansion far exceeded the increase in the general price. The total PSE expanded by 83.7%, MPS by 84.8%, and budgetary support by 59.8% during the period. However, the increase in the general price was only 0.3% (consumer prices) and 22.4% (IPI GDP).

Of the total PSE, more than 96% is market price support (MPS). About four percent comes from budgetary support. The high percentage of PSE coming from MPS implies that the bulk of the support is provided by transfers from consumers to producers through higher prices of food.

Moreover, in Figure 1.26, one may observe the fluctuations in PSE. The variation is largely due to the changes in domestic and international prices and the gap between the two prices.

The MPS calculation of the OECD database covers 11 commodities. Price support to rice production comprises the bulk of MPS (Table 1.6). From 2013 to 2019, more than 50% of the total MPS for agri-fisheries went to rice production. Pork and poultry production are the other major commodities that benefit from market price support. However, their combined share to the total MPS has declined over time from the peak of 65% in 2004 to 26.9% in 2019. The other commodity that benefits from market price support is sugarcane (centrifugal) production. From a peak of 15.6% in 2008, its share declined to 9.1% in 2019.

The market price support for beef and veal production is minimal. Market price for maize (corn) is negative in some years. Moreover, there is no market price support for the production of banana, coconut, mango, and pineapple.

Budgetary support to agri-fisheries production comprises two major components: variable input use and fixed capital formation (Table 1.7). In the period 2000-2014, variable input use captured 48.1% of the total, while fixed capital formation was 45.3%. However, over the years, the structure changed from variable input use to fixed capital formation. From the period (2000-

**Table 1.6: Commodity-specific Share Distribution of Market Price Support 2000-2019, %**

COMMODITY	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Maize	13.8	13.9	3.0	17.0	-7.9	-15.2	13.8	5.1	15.4	8.6
Rice	41.2	42.2	46.8	34.5	32.4	36.8	33.3	33.4	23.0	36.0
Sugar cane- centrifugal	0.8	-2.0	-3.5	-18.3	0.4	7.1	10.7	12.3	15.6	9.1
Beef and veal	1.8	1.8	1.8	3.1	2.3	1.9	1.3	1.3	1.5	1.3
Pork	17.3	19.1	26.0	32.2	43.4	42.3	16.8	22.0	19.9	20.6
Poultry	11.8	14.4	14.9	22.2	21.8	18.2	10.9	13.2	11.9	9.9
Eggs	1.3	-0.5	1.4	1.8	1.9	1.7	0.7	1.0	1.0	0.9
Bananas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coconut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mango	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pineapple	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other MPS	12.1	11.2	9.5	7.5	5.7	7.2	12.4	11.8	11.7	13.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Maize	-3.7	2.8	0.3	4.2	1.0	-8.7	5.6	-0.1	3.6	1.8
Rice	38.2	33.9	47.0	51.2	56.4	57.1	50.5	56.3	58.2	54.7
Sugar cane- centrifugal	15.4	11.6	9.2	6.1	7.6	5.8	8.6	9.3	10.4	9.1
Beef and veal	1.2	1.4	1.1	0.9	0.8	1.0	1.0	0.9	0.8	1.0
Pork	25.3	24.4	18.8	14.3	14.0	21.5	12.9	16.4	12.1	14.3
Poultry	10.7	12.1	10.6	8.2	7.8	10.4	9.0	10.4	9.4	12.6
Eggs	0.9	1.1	0.8	0.6	0.5	0.8	0.6	0.9	0.7	1.0
Bananas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Coconut	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mango	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pineapple	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other MPS	11.9	12.7	12.0	14.5	11.9	12.1	11.9	5.9	4.9	5.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Source: OECD										

**Table 1.7: Share Distribution of Components of Budgetary Transfer, %**

COMPONENTS	2000	2001	2002	2003	2004	2005	2006	2007
Variable input use	36.8	58.1	60.9	65.5	70.7	54.6	50.0	58.5
Fixed capital formation	55.7	30.6	31.4	28.3	23.1	39.3	44.2	35.3
Others	7.5	11.3	7.7	6.2	6.3	6.2	5.8	6.2
<b>Total</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>
		2008	2009	2010	2011	2012	2013	2014
Variable input use		34.2	61.1	52.5	32.1	25.1	23.2	38.1
Fixed capital formation		62.7	35.8	42.4	65.5	72.3	64.8	48.8
Others		3.1	3.2	5.1	2.4	2.6	12.0	13.1
<b>Total</b>		<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>	<b>100.0</b>

Source: OECD

2007) to (2008-2014) the average share of variable input declined from 56.9% to 38.0%, while the average share of fixed capital formation increased from 36.0% to 56.0%.

Table 1.8 provides a detailed structure of support to agri-fisheries from 2000 to 2019. The table also presents who is paying for the support. The producer support estimates (PSE) are presented in peso value as well as percent of the total value of production valued at farmgate prices. As shown in Table 1.8, the percentage PSE fluctuates, but the trend of the support to agri-fisheries is generally increasing over time.

The general services support estimate (GSSE), which largely consists of “development and maintenance of infrastructure” and “agricultural knowledge and innovation system” (Table 1.8) is expressed in peso value as well as percent of the total support estimate (TSE). One can observe from the data that GSSE as a percent of TSE is also on an upward trajectory, increasing from a low ratio of 6.9% in 2006 to 18.3% in 2019.

Another set of important information presented in Table 1.8 is the breakdown of the financing of the total support to agri-fisheries, which consists of three items: (1) transfers from consumers; (2) transfers from taxpayers; and (3) the associated government budgetary receipts. Item 3 is negative as the government imposes taxes based on the market price support (MPS), which is higher than the external reference price. In the process, budgetary receipts are generated. Thus, the associated budgetary receipts are netted out of the total support to agri-fisheries.

Based on the data, more than 90% of the total support to agri-fisheries is financed by transfers from consumers in the form of high market price support. This has important implications on food prices in the country and poverty as discussed in a latter part of the paper.

Moreover, the total support to agri-fisheries increased from PHP121 billion in 2000 to PHP464 billion in 2019. From 2000 to 2019, TSE represents about three percent of GDP. Table 1.9 shows the share distribution of components of general services support in the sector.

## Revealed Comparative Advantage of Philippine Agri-fisheries and Food

### *Revealed Comparative Advantage*

This section provides estimates of the revealed comparative advantage (RCA) of Philippine agri-fishery-food commodities relative to: (1) the world; (2) the Regional Comprehensive Economic Partnership (RCEP); and (3) the Association of Southeast Asian Nations (ASEAN). The Philippines is a member of ASEAN, and in November 2020, members of ASEAN signed an economic partnership with five non-ASEAN countries (Australia, China, Japan, South Korea, and New Zealand) to form RCEP. The potential for growth of the Philippines within RCEP is significant as the partnership captures 30% of world GDP and 30% of world population (Cororaton, 2021). ASEAN has evolved into a regional economic community. As a member of the community, therefore, ASEAN is critical to Philippine agri-fishery-food commodity trade.

In theory, the patterns of international trade are based on the relative difference in productivity among countries, i.e., countries' export commodities where production is relatively productive. However, it is very difficult to have estimates of commodity productivity differences across countries. Balassa (1965) suggested that such productivity differences across countries may be “revealed” through RCA estimated using actual trade data. Thus, the comparative advantage measured and inferred from observed data is “revealed” comparative advantage.

RCA is commonly used to assess a country's export potential (or a specific commodity within a country). Also, RCA may be used to provide important information about the potential trade prospects within new trading partners. Estimates of RCA for Philippine agri-food commodities may provide important information as the country enters into several trade agreements bilaterally and regionally.



**Table 1.8: Estimate of Support to Agri-fisheries in the Philippines, PHP Million**

VARIABLE	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Total value of production (TVP) /1	452,926	469,344	502,833	534,934	637,774	680,088	747,585	838,922	1,000,381	1,033,499
Producer Support Estimate (PSE)	108,352	104,693	103,194	63,724	86,647	106,908	157,412	164,338	174,055	223,994
Percentage PSE (%)	23.9	22.3	20.5	11.9	13.6	15.7	21.1	19.6	17.4	21.7
General Services Support Estimate (GSSE)	12,766	9,944	12,872	11,072	10,618	9,765	11,695	13,461	17,862	31,136
Percentage GSSE (% of TSE)	10.5	8.7	11.1	14.8	10.9	8.4	6.9	7.6	9.3	12.2
Total Support Estimate (TSE)	121,118	114,637	116,066	74,796	97,265	116,673	169,106	177,799	191,917	255,130
Transfers from consumers	123,909	120,155	113,405	73,258	87,426	105,969	185,553	184,883	198,356	249,013
Transfers from taxpayers	5,759	319	10,352	5,599	15,829	20,471	-3,403	7,268	5,777	27,304
Budget Revenues	-8,550	-5,837	-7,691	-4,061	-5,990	-9,767	-13,043	-14,352	-12,216	-21,187
Gross Domestic Product (GDP)	3,580,714	3,888,801	4,198,345	4,548,102	5,120,435	5,677,750	6,271,157	6,892,721	7,720,903	8,026,143
Percentage of TSE (% of GDP)	3.4	2.9	2.8	1.6	1.9	2.1	2.7	2.6	2.5	3.2
	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Total value of production (TVP)	1,091,541	1,229,215	1,235,225	1,288,545	1,432,627	1,370,485	1,390,387	1,403,548	1,492,233	1,384,373
Producer Support Estimate (PSE)	246,504	222,527	287,158	353,428	408,140	378,562	374,663	357,289	447,182	379,507
Percentage PSE (%)	22.6	18.1	23.2	27.4	28.5	27.6	26.9	25.5	30.0	27.4
General Services Support Estimate (GSSE)	38,496	27,445	47,106	58,608	66,125	65,174	68,504	77,432	85,051	85,051
Percentage GSSE (% of TSE)	13.5	11.0	14.1	14.2	13.9	14.7	15.5	17.8	16.0	18.3
Total Support Estimate (TSE)	285,000	249,972	334,264	412,035	474,265	443,736	443,167	434,721	532,234	464,558
Transfers from consumers	264,269	246,056	309,921	387,708	441,907	376,564	423,699	379,805	481,068	409,160
Transfers from taxpayers	46,175	25,118	47,396	48,517	58,741	92,872	57,645	85,846	85,974	88,228
Budget Revenues	-25,444	-21,202	-23,053	-24,189	-26,383	-25,700	-38,177	-30,930	-34,808	-32,830
Gross Domestic Product (GDP)	9,003,480	9,708,332	10,561,089	11,538,410	12,634,187	13,322,041	14,480,349	15,807,596	17,426,202	18,613,044
Percentage of TSE (% of GDP)	3.2	2.6	3.2	3.6	3.8	3.3	3.1	2.8	3.1	2.5

Source: OECD

/1 At farmgate prices

**Table 1.9: Share Distribution of Components of General Services Support, %**

GENERAL SERVICE	2000	2001	2002	2003	2004	2005	2006	2007
Agricultural knowledge and innovation system	26.5	24.1	17.9	19.1	17.1	18.4	19.2	15.5
Inspection and control	4.7	2.9	8.8	14.8	8.7	2.8	2.2	2.4
Development and maintenance of infrastructure	65.4	59.9	64.2	51.5	53.6	57.1	50.4	65.0
Marketing and promotion	2.8	3.2	1.7	1.3	1.3	1.3	1.2	1.2
Cost of public stockholding	0.0	9.2	7.0	8.9	8.5	9.2	7.7	8.2
Miscellaneous	0.7	0.7	0.4	4.4	10.8	11.2	19.3	7.7
<i>Total</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>
		<b>2008</b>	<b>2009</b>	<b>2010</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>
Agricultural knowledge and innovation system		21.4	22.3	13.6	22.3	18.2	20.6	19.8
Inspection and control		2.7	2.4	3.5	3.6	2.8	4.6	2.3
Development and maintenance of infrastructure		55.3	56.2	53.9	58.8	64.6	61.5	66.7
Marketing and promotion		2.1	2.8	2.4	4.4	3.1	2.8	1.5
Cost of public stockholding		11.2	12.8	20.8	9.1	8.5	7.3	6.4
Miscellaneous		7.3	3.5	5.7	1.7	2.8	3.3	3.3
<i>Total</i>		<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>

Source: OECD

There are several additions and modifications to the RCA index as originally proposed. However, the standard formula used to calculate RCA of commodity  $i$  in country  $j$  in year  $t$  is

$$RCA_{ijt} = \frac{\left( \frac{E_{ijt}}{\sum_i E_{ijt}} \right)}{\frac{\sum_n E_{int}}{\sum_n \sum_i E_{int}}}$$

where  $E$  is exports. In the analysis,  $i$  is the set of commodities in agri-food, which includes the two-digit harmonized system (HS) product classification from 01 to 24 plus 52, as well as the four-digit HS within each of the two-digit HS,  $j$  refers to the Philippines;  $n$  is a set of countries (the world, 15 members of RCEP, and 10 members of ASEAN); and  $t$  is year (from 1996 to 2018).

In the RCA formula, the numerator is the proportion of Philippine exports of agri-fishery-food commodity  $i$  to the overall total agri-food exports of the country in year  $t$ . The denominator is the proportion of exports of the same agri-fishery-food commodity  $i$  of  $n$  sets of countries to the overall total agri-fishery-food exports of these countries in year  $t$ . If  $RCA_{ijt}$  is greater than 1 ( $RCA_{ijt} > 1$ ), it implies that there is revealed comparative **advantage** in agri-fishery-food commodity  $i$  in the Philippines in year  $t$ . Otherwise, if  $RCA_{ijt}$  is less than 1 ( $RCA_{ijt} < 1$ ), it means revealed comparative **disadvantage**.

The data used in the estimation of RCA is the bilateral trade (exports and imports) data of the United Nations Comtrade (UN Comtrade) from 1996 to 2018. The commodity disaggregation in the UN Comtrade data is a six-digit harmonized system (HS), but in the analysis the data is aggregated to two-digit HS and four-digit HS.

Table 1.10 presents the sectoral description of 25 agri-fishery-food commodities at two-digit HS included in the analysis. The commodity classifications from 01 to 24 are primary agri-fisheries and manufactured food. In the list, cotton is included, which is classification 25. In the presentation of results, only  $RCA_{ijt}$  greater than 1 ( $RCA_{ijt} > 1$ ) are shown, i.e., only those agri-food commodities where the Philippines has revealed comparative advantage are presented and analyzed. RCA estimates that are less than 1 ( $RCA_{ijt} < 1$ ) are not shown but may be available upon request.

**Table 1.10: Two-digit HS Description of Commodities**

HS 2	Description
01	Live animals
02	Meat and edible meat offal
03	Fish and crustaceans; mollusks and other aquatic invertebrates
04	Dairy produce; birds' eggs; natural honey; edible products of animal origin, not elsewhere specified or included
05	Products of animal origin, not elsewhere specified or included
06	Live trees and other plants; bulbs, roots and the like; cut flowers and ornamental foliage
07	Edible vegetables and certain roots and tubers
08	Edible fruit and nuts; peel of citrus fruit or melons
09	Coffee, tea, mate and spices
10	Cereals
11	Products of the milling industry; malt; starches; inulin; wheat gluten
12	Oil seeds and oleaginous fruits; miscellaneous grains, seeds and fruit; industrial or medicinal plants; straw and fodder
13	Lac; gums, resins and other vegetable saps and extracts
14	Vegetable planting materials: vegetable products not elsewhere specified or included
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
16	Preparations of meat, of fish or crustaceans, mollusks or other aquatic invertebrates
17	Sugars and sugar confectionery
18	Cocoa and cocoa preparations
19	Preparations of cereals, flour, starch or milk; pastrycooks' products
20	Preparations of vegetables, fruits, nuts or other parts of plants
21	Miscellaneous edible preparations
22	Beverages, spirits and vinegar
23	Residues and waste from food industries; prepared animal fodder
24	Tobacco and manufactured tobacco substitutes
25	Cotton

Source: UN Comtrade

### ***Revealed Comparative Advantage of Philippine Agri-Food Relative to World***

**Two-digit HS.** Table 1.11 presents the Philippine RCA estimates on agri-food commodities relative to the world. The commodities are sorted based on the level of the RCA estimates. Out of 25 commodities at two-digit HS in Table 1.11, the Philippines has revealed comparative advantage in seven commodities: 08, 13, 15, 16, 24, 20 and 03. The RCA estimates for 08 and 13 are consistently high from 1996 to 2018. The RCA estimates for commodity 15 dropped from 5.94 in 1996 to 3.24 in 2018, while commodity 16 remained generally stable at above 2.0 over the period. The RCA estimates for commodity 24 are on an upward trend from initially less than 1.0, which indicate revealed comparative disadvantage, to more than 2.0 in recent years. The RCA estimates for commodity 03 are consistently above 1.0 over the years, but low relative to the other commodities in the table.

Table 1.12 shows the export structure of Philippine agri-food commodities which have revealed comparative advantage. The structure of export is defined as the share distribution in percent of commodities relative to the total agri-food exports of the country.

Commodity 08 (edible fruit and nuts; peel of citrus fruit or melons), which has the highest RCA estimates, dominates the exports of agri-food commodities, capturing 33% of the total. In contrast, commodity 13 (lac; gums, resins, and other vegetable saps and extracts), which is as competitive as commodity 08, has a small export share of only about three percent, which may imply that in spite of being competitive, export promotion for commodity 13 seems inadequate.

**Table 1.11: Two-digit HS Revealed Comparative Advantage of Philippine Agri-fishery Food Commodities Relative to the World**

YEAR	TWO-DIGIT HS						
	08	13	15	16	24	20	03
1996	6.05	6.22	5.94	2.42	0.27	2.70	1.50
1997	6.32	6.10	4.17	2.93	0.37	3.09	1.51
1998	6.45	4.49	4.91	3.41	0.34	2.46	1.42
1999	7.86	6.34	3.36	2.88	0.44	2.64	1.71
2000	7.58	5.87	4.63	2.01	0.46	2.60	1.66
2001	7.78	5.94	4.54	2.08	0.53	2.78	1.51
2002	7.91	6.14	3.33	2.53	0.49	2.75	1.50
2003	7.39	5.49	3.32	2.41	0.57	2.58	1.48
2004	6.97	5.88	3.43	2.11	1.19	2.47	1.39
2005	6.67	5.56	3.29	2.13	1.29	2.48	1.35
2006	7.12	6.28	3.02	2.07	1.29	2.39	1.42
2007	7.13	7.16	2.76	2.37	1.36	2.11	1.46
2008	7.21	7.63	2.76	2.88	1.50	1.95	1.37
2009	7.46	7.69	2.09	2.68	1.92	2.21	1.27
2010	7.00	6.93	3.44	2.32	1.99	1.97	1.24
2011	7.33	5.24	2.82	1.97	1.96	2.05	1.22
2012	6.72	3.56	2.63	2.48	1.90	2.21	1.54
2013	6.45	4.62	2.77	2.49	2.12	2.21	1.39
2014	6.63	5.16	3.19	2.13	2.16	2.10	1.33
2015	5.48	6.09	3.15	2.10	2.08	2.40	1.19
2016	5.04	5.60	3.25	2.07	1.81	2.32	1.12
2017	4.65	4.70	3.45	2.33	1.72	2.22	1.07
2018	5.27	4.84	3.24	2.43	2.27	1.86	1.02

Source: United Nations Comtrade

**Table 1.12: Two-digit HS Share Distribution (%)**

YEAR	TWO-DIGIT HS								ALL OTHERS	TOTAL
	08	13	15	16	24	20	19	03		
1996	24.1	2.9	25.8	7.3	1.2	10.8	0.6	12.3	15.1	100.0
1997	24.4	2.8	21.7	8.8	1.8	11.7	1.1	11.7	16.1	100.0
1998	23.4	2.3	27.6	10.4	1.6	10.0	0.9	11.0	12.8	100.0
1999	28.7	3.2	17.2	8.8	1.9	11.5	1.3	14.6	12.6	100.0
2000	28.9	2.8	19.5	6.3	2.0	10.8	1.7	15.0	13.0	100.0
2001	27.6	2.8	18.3	6.7	2.2	11.2	2.7	13.4	15.0	100.0
2002	30.4	2.8	16.0	8.1	2.0	11.4	2.6	12.8	14.0	100.0
2003	29.0	2.5	17.4	7.5	2.0	10.9	2.4	12.0	16.4	100.0
2004	27.8	2.6	18.7	6.7	4.1	10.3	2.8	11.0	16.1	100.0
2005	28.4	2.7	17.2	7.2	4.3	10.3	3.2	10.7	16.1	100.0
2006	28.7	2.9	16.7	7.1	4.0	10.2	3.5	11.3	15.6	100.0
2007	29.0	3.0	17.2	7.8	4.2	9.3	3.6	10.4	15.7	100.0
2008	28.6	3.2	20.7	9.1	4.3	8.1	3.6	8.7	13.7	100.0

YEAR	TWO-DIGIT HS								ALL OTHERS	TOTAL
	08	13	15	16	24	20	19	03		
2009	33.5	3.5	13.0	8.6	6.2	9.1	4.0	8.7	13.4	100.0
2010	28.3	3.1	23.0	6.9	5.9	7.6	4.2	8.5	12.5	100.0
2011	28.9	2.7	21.3	5.8	5.4	7.7	3.9	8.1	16.1	100.0
2012	29.1	2.7	19.1	7.7	5.4	8.2	4.4	10.0	13.4	100.0
2013	30.2	2.6	18.0	7.7	5.9	8.4	5.0	9.3	13.0	100.0
2014	33.2	2.7	19.6	6.5	5.7	7.9	4.1	9.3	11.0	100.0
2015	32.3	3.0	19.1	6.3	5.6	9.4	4.2	8.3	11.9	100.0
2016	33.5	2.6	19.8	6.1	4.9	9.1	3.9	8.5	11.6	100.0
2017	32.4	2.1	22.0	7.8	4.4	8.5	3.8	7.7	11.3	100.0
2018	35.0	2.4	19.0	8.7	6.3	7.2	3.6	7.4	10.5	100.0

Source: UN Comtrade

Commodity 15 (animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes) is also a dominant agri-food export, capturing about 20% of the total. However, its RCA estimates are slightly declining. The export share of commodity 16 (preparations of meat, of fish or crustaceans, and mollusks or other aquatic invertebrates) is generally stable at about eight percent of the total while its RCA estimates are also stable. The export share of commodity 24 (tobacco and manufactured tobacco substitutes) is increasing, so are its RCA estimates. The export shares of commodity 20 (preparations of vegetables, fruits, nuts or other parts of plants) and 03 (fish and crustaceans; mollusks and other aquatic invertebrates) are declining, but their RCA estimates are generally stable. Table 1.12 also includes the share of commodity 19, but this is discussed in the next section in relation to its RCA estimates relative to RCEP.

Table 1.13 presents the export growth performance of Philippine agri-fishery-food commodities with  $RCA_{ijt} > 1$ . Over the period from 1996 to 2018, total exports expanded by an average of 5.2% per year. The growth peaked at 9.8% per year in the 2001-2010 period.

The export growth performance varies across commodities at two-digit HS with  $RCA_{ijt} > 1$ . Relative to the average total export growth of agri-fishery-food over the 1996-2018 period, commodities 19, 24, 08 and 16 outperformed commodities 13 and 03. One may observe that in spite of commodities 08 and 13 having very high RCA estimates, their export growth remained practically stagnant in the period 2011-2018.

**Table 1.13: Average Annual Geometric Growth in Various Periods, %**

PERIOD	TWO-DIGIT HS								OTHERS	TOTAL
	08	13	15	16	24	20	19	03		
1996-2000	5.1	0.1	-6.4	-3.0	14.5	0.3	27.4	5.6	-3.4	0.4
2001-2010	10.0	10.8	12.6	10.2	22.1	5.2	15.1	4.4	7.6	9.8
2011-2018	3.6	-0.8	-0.8	6.7	3.0	-0.1	0.0	-0.5	-5.2	0.8
1996-2018	7.0	4.3	3.8	6.1	13.6	3.3	13.8	2.8	3.5	5.2

Source: UN Comtrade

**Two-digit HS.** The two-digit HS commodity classification discussed above is still broad. This section looks into the four-digit HS commodity classification in each of the two-digit HS with  $RCA_{ijt} > 1$  presented in Table 1.11.

Table 1.14 presents a list of four-digit HS agri-fishery-food commodities 08, 13, 15, 16, 24, 20, 19 and 03. Some of the four-digit HS commodities included in the list are discussed in the section on RCA relative to RCEP and to ASEAN.

**Table 1.14: Four-digit HS Description of Commodities**

<b>HS 4</b>	<b>Description</b>
0301	Live fish
0303	Fish, frozen, excluding fish fillets and other fish meat of heading 03.04
0306	Crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; smoked crustaceans, whether in shell or not, whether or not cooked before or during the smoking process, crustaceans, in shell, cooked by steaming or by boiling
0307	Mollusks, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; smoked mollusks, whether in shell or not, whether or not cooked before or during the smoking process, flours, meals and pellets of mollusks, fit for human consumption
0801	Coconuts, Brazil nuts and cashew nuts, fresh or dried, whether or not shelled or peeled
0803	Bananas, including plantains, fresh or dried
0804	Dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried
0811	Fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter
0812	Fruit and nuts, provisionally preserved (for example, by sulphur dioxide gas, in brine, in sulphur water or in other preservative solutions), but unsuitable in that state for immediate consumption
1302	Vegetable saps and extracts; pectic substances, pectinates and pectates; agar agar and other mucilage and thickeners, whether or not modified, derived from vegetable products
1504	Fats and oils and their fractions, of fish or marine mammals, whether or not refined, but not chemically modified
1513	Coconut (copra), palm kernel or babassu oil and fractions thereof, whether or not refined, but not chemically modified
1520	Glycerol, crude; glycerol waters and glycerol lyes
1604	Prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs
1605	Crustaceans, mollusks and other aquatic invertebrates, prepared or preserved
1904	Prepared foods obtained by the swelling or roasting of cereals or cereal products (for example, corn flakes); cereals (other than maize, corn) in grain form or in the form of flakes or other worked grains (except flour, groats and meal), precooked
1905	Bread, pastry, cakes, biscuits and other bakers' wares, whether or not containing cocoa; communion wafers, empty cachets of a kind suitable for pharmaceutical use, sealing wafers, rice paper and similar products
2007	Jams, fruit jellies, marmalades, fruit or nut purée and fruit or nut pastes, obtained by cooking, whether or not containing added sugar or other sweetening matter
2008	Fruit, nuts and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included
2009	Fruit juices (including grape must) and vegetable juices, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter
2401	Unmanufactured tobacco; tobacco refuse
2402	Cigars, cheroots, cigarillos and cigarettes, of tobacco or of tobacco substitutes
2403	Other manufactured tobacco and manufactured tobacco substitutes; "homogenized" or "reconstituted" tobacco; tobacco extracts and essences

Source: United Nations Comtrade

Table 1.15 presents the four-digit HS with  $RCA_{ijt} > 1$ . Within commodity 08, there are three sub-categories at four-digit HS where  $RCA_{ijt} > 1$ : 0803, 0801, and 0804. Sub-category 0803 (bananas, including plantains, fresh or dried) has the highest revealed comparative advantage, with RCA estimates sustained at almost 30. However, the RCA estimates of sub-categories 0801 (coconuts, Brazil nuts and cashew nuts, fresh or dried, whether or not shelled or peeled) and 0804 (dates, figs, pineapples, avocados, guavas, mangoes and mangosteens, fresh or dried) are declining.

Within commodity 08, Table 1.16 shows that the share of sub-category 0803 is sustained at about 70%. The share of sub-category 0801 is sustained at about 13%, while the share of sub-category 0804 has declined over time.

Sub-category 1302 (vegetable saps and extracts; pectic substances, pectinates and pectates; agar agar, and other mucilage and thickeners, whether or not modified, derived from vegetable products) is also highly competitive with RCA estimates of more than 6.0. Table 1.17 indicates that sub-category 1302 dominates the share within commodity 13.



**Table 1.15: Four-digit HS Revealed Comparative Advantage of Philippine Agri-fishery-Food Commodities Relative to the World**

	Four-Digit HS																	
	0803	0801	0804	1302	1513	1520	1504	1604	1605	2402	2403	2401	2008	2009	0301	0307	0306	0303
1996	15.17	11.98	14.60	7.17	75.57	5.01	0.02	5.68	1.16	0.02	0.18	0.83	9.74	1.68	2.47	2.10	2.75	0.28
1997	13.74	12.95	15.27	7.08	61.46	1.95	0.11	6.90	1.01	0.16	0.09	0.86	10.76	2.12	3.11	3.02	2.48	0.57
1998	13.61	11.74	12.73	5.16	74.22	2.11	0.06	7.98	1.08	0.05	0.10	1.03	9.16	1.62	3.20	2.29	2.24	0.72
1999	18.09	10.66	11.52	7.23	45.78	1.78	0.02	6.61	1.12	0.18	0.06	1.04	10.19	1.75	2.43	2.15	2.25	1.84
2000	20.94	9.52	11.70	6.74	55.14	0.33	0.05	4.71	0.81	0.27	0.33	0.88	9.91	1.81	4.83	1.85	2.40	1.36
2001	20.38	10.21	11.93	6.86	75.36	0.60	0.14	4.70	1.22	0.33	0.39	0.96	9.14	2.72	4.80	1.90	2.29	0.99
2002	22.09	13.14	11.29	6.96	57.22	0.81	0.29	5.75	1.46	0.32	0.13	0.97	9.41	2.49	4.95	1.99	2.31	1.04
2003	22.11	12.78	9.59	6.30	58.17	1.09	0.23	5.58	1.41	0.50	0.35	0.76	8.64	2.36	4.69	2.38	2.01	1.26
2004	21.61	9.93	10.41	6.92	52.24	1.37	0.10	4.97	1.22	1.54	0.43	0.78	8.02	2.42	3.89	2.10	1.79	1.49
2005	21.20	9.89	9.61	6.75	47.43	1.61	0.03	4.92	1.65	1.31	1.89	1.05	7.67	2.33	4.59	1.67	1.73	1.26
2006	23.59	10.31	9.58	7.39	54.20	7.93	0.03	4.77	1.45	1.28	1.92	1.10	7.56	2.26	6.03	1.55	1.66	1.67
2007	24.71	11.76	9.26	8.37	44.54	-	0.22	5.49	1.72	1.22	2.51	1.31	7.49	1.58	5.91	1.62	1.53	1.75
2008	26.19	11.81	8.93	8.60	43.69	2.95	0.91	6.84	1.84	1.11	4.37	1.44	6.98	1.28	5.04	1.51	1.32	1.94
2009	28.30	11.29	8.97	8.83	38.44	4.37	0.67	6.57	1.62	1.14	4.54	2.50	7.38	1.98	6.44	1.52	1.32	1.49
2010	44.16	3.36	4.18	-	47.97	1.16	2.11	8.11	0.49	6.66	1.13	1.31	4.74	3.56	4.98	1.60	1.21	1.60
2011	42.80	5.69	5.07	-	37.91	1.23	1.57	6.66	0.41	5.72	1.00	1.25	4.64	3.65	4.92	1.68	1.16	1.43
2012	29.88	10.25	9.55	3.84	41.68	1.38	0.17	5.35	1.85	1.05	4.99	2.28	6.89	1.73	7.62	1.62	1.14	1.64
2013	29.86	9.78	8.99	5.08	47.71	1.09	0.17	5.75	1.73	1.30	4.69	2.50	7.05	1.75	10.47	1.15	1.27	1.50
2014	29.85	10.61	8.32	5.66	39.99	2.20	1.32	7.15	0.78	5.14	2.20	1.12	5.51	3.72	9.95	1.25	1.34	1.36
2015	27.22	8.72	8.29	6.82	42.82	3.06	1.26	6.86	0.82	4.89	2.09	1.28	6.71	3.70	11.28	1.13	1.13	0.81
2016	26.49	7.53	8.12	6.24	43.06	2.80	2.79	6.77	0.61	4.07	2.23	1.00	6.69	3.65	10.02	1.36	1.09	0.84
2017	25.60	4.38	5.94	-	70.86	-	1.73	2.68	5.40	2.02	-	3.81	-	-	9.27	1.51	1.17	0.94
2018	26.69	5.77	8.02	-	50.23	-	3.07	-	3.77	-	-	-	6.73	-	7.04	1.70	0.98	0.94

Source: United Nations Comtrade



**Table 1.16: Four-digit HS Share Distribution of Commodity 08 (%)**

YEAR	0801	0803	0804	OTHERS	TOTAL
1996	11.9	68.6	18.5	1.1	100.0
1997	13.7	66.1	19.4	0.8	100.0
1998	13.0	68.7	17.8	0.5	100.0
1999	12.1	72.9	14.3	0.7	100.0
2000	10.8	74.1	14.1	1.1	100.0
2001	8.7	74.1	15.9	1.3	100.0
2002	11.2	73.4	14.2	1.2	100.0
2003	11.3	73.0	14.9	0.8	100.0
2004	10.6	71.6	16.5	1.4	100.0
2005	11.5	70.6	16.7	1.2	100.0
2006	10.0	72.6	16.0	1.4	100.0
2007	11.5	71.0	16.0	1.5	100.0
2008	12.2	72.2	14.1	1.4	100.0
2009	10.3	75.3	13.0	1.5	100.0
2010	10.4	74.3	13.8	1.6	100.0
2011	16.3	68.0	13.9	1.8	100.0
2012	13.4	69.1	15.5	2.0	100.0
2013	11.5	71.2	15.3	2.0	100.0
2014	13.8	70.0	14.4	1.8	100.0
2015	14.5	67.4	16.3	1.9	100.0
2016	13.1	67.2	18.0	1.6	100.0
2017	15.0	66.7	16.3	2.0	100.0
2018	13.8	69.8	14.4	2.0	100.0

Source: UN Comtrade

**Table 1.17: Four-digit HS Share Distribution of Commodity 13 (%)**

YEAR	1302	OTHERS	TOTAL
1996	97.1	2.9	100.0
1997	98.1	1.9	100.0
1998	97.1	2.9	100.0
1999	96.8	3.2	100.0
2000	96.9	3.1	100.0
2001	96.8	3.2	100.0
2002	96.3	3.7	100.0
2003	96.8	3.2	100.0
2004	97.2	2.8	100.0
2005	97.1	2.9	100.0
2006	97.3	2.7	100.0
2007	98.0	2.0	100.0
2008	98.6	1.4	100.0
2009	98.9	1.1	100.0
2010	98.4	1.6	100.0
2011	98.2	1.8	100.0
2012	98.7	1.3	100.0
2013	98.2	1.8	100.0
2014	97.3	2.7	100.0
2015	97.1	2.9	100.0
2016	97.6	2.4	100.0
2017	97.8	2.2	100.0
2018	98.1	1.9	100.0

Source: UN Comtrade

Within commodity 15, sub-category 1513 (coconut including copra), palm kernel or babassu oil (and fractions thereof, whether or not refined, but not chemically modified) is highly competitive (Table 1.18). The RCA estimates for sub-category 1520 (glycerol, crude; glycerol waters, and glycerol lyes) are generally greater than 1.0, but considerably lower than the estimates for sub-category 1513. Generally, sub-category 1504 (Fats and oils and their fractions, of fish or marine mammals, whether or not refined, but not chemically modified) has revealed comparative disadvantage as indicated by its low RCA estimates. However, its RCA estimates improved recently beginning in 2014.

**Table 1.18: Four-digit HS Share Distribution of Commodity 15 (%)**

YEAR	1513	1520	1504	OTHERS	TOTAL
1996	98.1	0.9	0.0	1.1	100.0
1997	99.2	0.3	0.0	0.5	100.0
1998	98.8	0.2	0.0	1.0	100.0
1999	98.6	0.3	0.0	1.2	100.0
2000	97.8	0.1	0.0	2.1	100.0
2001	98.4	0.1	0.1	1.5	100.0
2002	98.3	0.1	0.1	1.4	100.0
2003	98.1	0.2	0.1	1.6	100.0
2004	98.8	0.2	0.0	1.0	100.0
2005	98.7	0.2	0.0	1.1	100.0
2006	98.8	0.5	0.0	0.7	100.0
2007	97.7	0.8	0.1	1.3	100.0
2008	98.3	0.4	0.6	0.7	100.0
2009	97.8	0.5	0.6	1.2	100.0
2010	98.8	0.1	0.2	1.0	100.0
2011	98.3	0.1	0.1	1.4	100.0
2012	90.6	0.2	0.1	9.1	100.0
2013	89.1	0.2	0.1	10.6	100.0
2014	90.6	0.3	0.1	9.0	100.0
2015	95.2	0.4	0.1	4.3	100.0
2016	96.7	0.3	0.2	2.8	100.0
2017	92.5	0.4	0.2	6.9	100.0
2018	92.3	0.3	0.4	7.0	100.0

Source: UN Comtrade

Sub-category 1520 has very small share to the total and has not changed over the years in spite of its RCA estimates greater 1.0. The RCA estimates for sub-category 1504 indicate improved competitiveness recently, but its share to the total has remained extremely small.

Within commodity 16, there are two sub-categories where RCA estimates are greater than 1.0: 1604 (prepared or preserved fish; caviar and caviar substitutes prepared from fish eggs); and 1605 (crustaceans, mollusks and other aquatic invertebrates, prepared or preserved). The RCA estimates of sub-category 1604 is significantly higher than sub-category 1605 (Table 1.19).

**Table 1.19: Four-digit HS Share Distribution of Commodity 16 (%)**

YEAR	1604	1605	Others	Total
1996	89.4	10.4	0.1	100.0
1997	92.7	7.2	0.0	100.0
1998	93.3	6.6	0.0	100.0
1999	90.3	9.6	0.1	100.0
2000	88.7	10.5	0.8	100.0
2001	84.7	14.6	0.6	100.0
2002	85.3	14.3	0.5	100.0
2003	85.2	14.5	0.4	100.0
2004	85.5	14.0	0.5	100.0
2005	80.6	18.3	1.1	100.0
2006	81.4	17.0	1.6	100.0
2007	81.5	16.0	2.5	100.0
2008	84.5	13.1	2.4	100.0
2009	84.7	12.3	3.0	100.0
2010	77.4	18.6	4.0	100.0
2011	77.3	18.3	4.4	100.0
2012	77.9	15.8	6.4	100.0
2013	82.4	14.5	3.1	100.0
2014	73.9	22.1	4.0	100.0
2015	72.6	22.6	4.8	100.0
2016	75.1	20.1	4.8	100.0
2017	68.6	28.0	3.4	100.0
2018	66.4	30.5	3.1	100.0

Source: UN Comtrade

Sub-category 1604 dominates commodity 16 with a share of more than 60% of the total. However, the share of sub-category 1604 has declined over the years from 89.4% in 1996 to 66.4% in 2018. The share of sub-category 1605 has increased considerably from 10.4% in 1996 to 30.5% in 2018.

Commodity 24 has three sub-categories, which indicate similarly increasing RCA estimates in general: 2402 (cigars, cheroots, cigarillos and cigarettes, of tobacco or of tobacco substitutes); 2403 (other manufactured tobacco and manufactured tobacco substitutes; “homogenized” or “reconstituted” tobacco; tobacco extracts and essences); and 2401 (unmanufactured tobacco; tobacco refuse). All these sub-categories indicate RCA estimates of less than 1.0 initially, but over time, their revealed comparative advantage improved with RCA estimates exceeding 1.0 (Table 1.20).

Table 1.20 also indicates that within commodity 24, the share of sub-category 2401 dropped considerably from 89.8% in 1996 to 30.3% in 2018. However, the shares of sub-categories 2402 and 2403 improved through the years.

Within commodity 20, the sub-category 2008 (fruit, nuts, and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included) is relatively more competitive than the sub-category 2009 (fruit juices (including grape must) and vegetable juices, unfermented and not containing added spirit, whether or not containing added sugar or other sweetening matter) as the RCA estimates of the former are significantly higher than the latter. Further, Table 1.21 indicates that sub-category 2008 captures more than 70% commodity 20.

**Table 1.20: Four-digit Share Distribution of Commodity 24 (%)**

YEAR	2401	2402	2403	Total
1996	89.8	5.8	4.4	100.0
1997	71.2	27.2	1.6	100.0
1998	87.8	9.9	2.3	100.0
1999	74.7	24.2	1.2	100.0
2000	56.5	36.5	7.0	100.0
2001	55.6	37.6	6.8	100.0
2002	57.3	40.2	2.5	100.0
2003	40.5	53.3	6.2	100.0
2004	19.7	76.6	3.7	100.0
2005	24.4	61.3	14.3	100.0
2006	25.6	60.1	14.3	100.0
2007	28.7	55.1	16.2	100.0
2008	29.7	44.2	26.1	100.0
2009	41.8	34.2	24.0	100.0
2010	37.3	37.4	25.4	100.0
2011	37.4	34.8	27.8	100.0
2012	35.6	32.1	32.4	100.0
2013	33.7	35.4	30.9	100.0
2014	29.3	34.3	36.4	100.0
2015	35.4	32.5	32.1	100.0
2016	30.9	35.0	34.1	100.0
2017	36.7	40.7	22.6	100.0
2018	30.3	56.7	12.9	100.0

Source: UN Comtrade

**Table 1.21: Four-digit HS Share Distribution of Commodity 20 (%)**

YEAR	2008	2009	Others	Total
1996	77.0	20.0	3.1	100.0
1997	76.4	20.8	2.8	100.0
1998	76.1	21.3	2.7	100.0
1999	76.2	21.4	2.4	100.0
2000	74.9	22.9	2.2	100.0
2001	68.4	29.1	2.5	100.0
2002	70.5	27.2	2.4	100.0
2003	68.5	27.9	3.7	100.0
2004	68.7	27.8	3.5	100.0
2005	68.7	27.2	4.1	100.0
2006	67.7	28.3	4.0	100.0
2007	72.1	23.7	4.1	100.0
2008	74.6	21.1	4.3	100.0
2009	69.1	26.2	4.7	100.0
2010	70.0	24.2	5.9	100.0
2011	70.0	24.6	5.4	100.0
2012	71.7	23.6	4.7	100.0
2013	71.9	22.5	5.7	100.0
2014	69.4	24.6	6.0	100.0
2015	72.5	21.7	5.8	100.0
2016	73.2	21.4	5.4	100.0
2017	73.0	22.9	4.1	100.0
2018	74.2	20.0	5.8	100.0

Source: UN Comtrade

Within commodity 03, the most competitive sub-category is 0301 (live fish), with RCA estimates significantly greater than 1. Generally declining trend in RCA estimates is observed for sub-category 0307 (mollusks, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; smoked mollusks, whether in shell or not, whether or not cooked before or during the smoking process; flours, meals and pellets of mollusks, fit for human consumption) and for sub-category 0306 (crustaceans, whether in shell or not, live, fresh, chilled, frozen, dried, salted or in brine; smoked crustaceans, whether in shell or not, whether or not cooked before or during the smoking process; crustaceans, in shell, cooked by steaming or by boiling). There were some years when sub-category 0303 (fish, frozen, excluding fish fillets and other fish meat) had RCA estimates slightly exceeding 1.0, but recently the estimates dropped below 1.0, indicating revealed comparative disadvantage.

Table 1.22 indicates that the export share of sub-category 0301 has expanded significantly from 4.4% in 1996 to 14.3% in 2018. However, exports of commodity 03 is dominated by sub-category 0303, 0306, 0304, and 0307. The export share of sub-category 0306 is relatively small.

**Table 1.22: Four-digit HS Share Distribution of Commodity 03**

YEAR	301	302	303	304	305	306	307	TOTAL
1996	4.4	9.2	3.8	11.4	1.1	52.4	17.7	100.0
1997	6.1	6.5	7.6	6.6	1.0	46.6	25.5	100.0
1998	5.5	13.6	9.5	4.7	2.8	45.3	18.6	100.0
1999	3.6	15.7	22.0	6.2	1.5	36.3	14.7	100.0
2000	6.2	11.8	16.7	7.8	2.0	42.9	12.7	100.0
2001	6.8	11.4	14.1	8.1	3.4	42.3	13.9	100.0
2002	7.6	10.7	15.0	7.4	3.0	40.7	15.5	100.0
2003	7.3	9.0	17.7	8.3	3.1	36.0	18.5	100.0
2004	6.8	9.4	22.4	8.7	3.7	31.9	17.2	100.0
2005	8.4	11.7	20.5	12.5	3.6	29.5	13.7	100.0
2006	9.1	11.8	25.0	13.7	2.6	26.1	11.6	100.0
2007	8.8	10.5	26.4	16.3	3.2	23.0	11.9	100.0
2008	8.6	10.1	31.3	14.1	4.5	19.8	11.6	100.0
2009	9.9	6.7	27.0	19.2	3.7	21.3	12.2	100.0
2010	9.1	6.3	29.7	18.6	2.8	19.9	13.5	100.0
2011	8.4	7.0	28.2	18.7	2.4	19.3	15.9	100.0
2012	10.8	6.5	25.9	27.1	2.7	15.3	11.8	100.0
2013	14.3	7.8	24.8	20.1	4.1	19.9	9.0	100.0
2014	13.5	6.6	22.1	20.1	3.2	24.5	10.0	100.0
2015	18.4	5.5	14.4	26.0	2.5	22.3	10.9	100.0
2016	16.8	6.9	15.6	21.4	2.8	22.5	14.0	100.0
2017	14.3	7.1	19.3	17.1	3.1	25.8	13.3	100.0
2018	14.3	7.9	20.2	19.1	2.4	21.1	15.1	100.0

Source: UN Comtrade

Estimates of RCA provide information about the export potential of commodities. The higher the value of the RCA estimates, the higher the export potential of a particular commodity. Relative to the world, there are seven out of 25 commodities at two-digit HS which the Philippines has revealed comparative advantage. However, there are several commodities which are observed to high revealed comparative advantage as indicate by high RCA estimates, but their shares to the total agri-food exports of the country have not improved over time. This is the case for commodity 13 (lac; gums, resins and other vegetable saps and extracts), in particular commodity 1302 (vegetable saps and extracts; pectic substances,

pectinates and pectates; agar agar and other mucilage and thickeners, whether or not modified, derived from vegetable products).

### **Revealed Comparative Advantage of Philippine Agri-Fishery-Food Relative to RCEP**

The Philippines will soon have access to a larger regional market as soon as the trade agreements in the Regional Comprehensive Economic Partnership (RCEP) are implemented at the start of 2022. It is therefore critical to have information on the export potential of agri-fishery-food commodities in the Philippines relative to RCEP.

Table 1.23 presents the RCA estimates for Philippine agri-fishery-food commodities relative to countries in RCEP.<sup>2</sup> The Philippines has revealed comparative advantage in seven out of 25 agri-food commodities relative to the regional market in RCEP: 08, 13, 24, 15, 20, 16, and 19.

**Table 1.23: Two-digit HS Revealed Comparative Advantage of Philippine Agri-fishery-Food Commodities Relative to RCEP**

YEAR	TWO-DIGIT HS						
	08	13	24	15	20	16	19
1996	6.05	6.46	0.46	3.29	2.73	1.11	0.33
1997	6.32	6.84	0.51	1.90	3.44	1.45	0.52
1998	6.45	5.43	0.54	2.33	3.00	1.68	0.49
1999	7.86	7.49	0.84	1.65	2.99	1.32	0.64
2000	7.58	6.97	0.92	2.33	2.95	0.92	0.74
2001	7.78	6.87	0.97	2.40	2.95	0.95	1.15
2002	7.91	7.10	0.84	1.59	2.84	1.17	1.04
2003	7.39	6.39	0.97	1.53	2.57	1.10	0.93
2004	6.97	6.89	2.06	1.60	2.41	0.96	1.03
2005	6.67	6.15	2.27	1.58	2.29	0.94	1.09
2006	7.12	6.48	2.21	1.42	2.16	0.89	1.19
2007	7.13	7.16	2.28	1.16	1.84	1.06	1.27
2008	7.21	7.10	2.52	1.12	1.75	1.33	1.26
2009	7.46	6.99	3.01	0.85	2.12	1.24	1.21
2010	7.00	6.55	2.99	1.40	1.90	1.05	1.28
2011	7.33	5.06	3.18	1.19	2.00	0.91	1.26
2012	6.72	5.28	2.83	1.13	2.08	1.09	1.37
2013	6.45	4.58	3.10	1.21	2.08	1.10	1.45
2014	6.63	4.62	2.93	1.36	2.09	0.99	1.23
2015	5.48	4.88	2.54	1.46	2.35	0.99	1.21
2016	5.04	4.34	2.18	1.56	2.26	0.97	1.04
2017	4.65	3.64	2.17	1.59	2.25	1.12	1.02
2018	5.27	3.62	2.93	1.50	1.89	1.14	0.90

Source: United Nations Comtrade

Similar to Table 1.11, commodities 08 and 13 have consistently high RCA estimates. The RCA estimates for commodity 24 indicate an increasing trend, while for commodity 15, the trend is slightly declining but still above 1.0. The RCA estimates for commodity 20 are generally stable at above 2.0. The RCA estimates for commodity 16 are slightly above 1.0 in recent years, but few estimates dipped slightly below 1.0 in several years prior. Commodity 03, which is in Table 1.11, is not among the list of commodities in Table 1.23.

<sup>2</sup> Australia, China, Japan, New Zealand, and South Korea

Relative to the regional market in RCEP, with RCA estimates consistently greater than 1.0 from 2004 to 2017, commodity 19 (preparations of cereals, flour, starch or milk; pastrycooks' products) is one of the commodities where the Philippines has revealed comparative advantage. However, Table 1.12 indicates that its export share is less than four percent and has not improved over time.

Table 1.24 presents the RCA estimates at four-digit HS of Philippine agri-fishery-food commodities relative to the regional market in RCEP. Except for the sub-categories under commodity 03, the RCA estimates at four-digit HS relative to RCEP are similar to the estimates relative to the world in Table 1.15. The difference is in commodity 19. RCA estimates are declining over time for the sub-category 1904 (prepared foods obtained by the swelling or roasting of cereals or cereal products (for example, corn flakes); cereals (other than maize, corn) in grain form or in the form of flakes or other worked grains (except flour, groats, and meal, precooked). Sub-category 1905 (bread, pastry, cakes, biscuits, and other bakers' wares, whether or not containing cocoa; communion wafers, empty cachets of a kind suitable for pharmaceutical use, sealing wafers, rice paper, and similar products) has RCA estimates that are less than 1.0 initially, but improved over time. Its RCA is about 1.5 in the past few years.

**Table 1.24: Four-digit HS Revealed Comparative Advantage of Philippine Agri-fishery Food Commodities Relative to RCEP**

YEAR	FOUR-DIGIT HS													
	0803	0804	0811	1302	2401	2403	2402	1513	2008	2009	2007	1604	1904	1905
1996	26.36	18.65	1.48	7.54	1.65	0.57	0.04	12.21	4.70	3.97	3.58	1.95	0.96	0.49
1997	30.78	19.35	1.22	8.32	1.87	0.14	0.19	11.05	5.67	5.06	3.95	2.63	3.64	0.48
1998	27.11	17.64	0.58	6.61	1.96	0.23	0.08	12.90	5.03	4.89	2.99	3.14	2.50	0.44
1999	30.78	19.18	0.41	8.99	2.30	0.15	0.31	8.80	4.94	4.38	2.61	2.59	3.62	0.45
2000	31.74	18.85	0.42	8.30	2.10	0.54	0.53	10.81	5.18	4.41	1.72	1.94	3.28	0.58
2001	32.98	19.71	0.46	8.01	2.17	0.65	0.56	14.72	4.80	5.43	1.74	1.98	3.74	0.64
2002	32.71	19.30	0.49	8.05	2.06	0.14	0.54	11.23	4.75	4.82	2.02	2.46	2.89	0.71
2003	31.89	18.88	0.45	7.37	1.56	0.57	0.81	11.14	4.24	4.20	3.56	2.45	3.17	0.74
2004	32.66	20.94	0.56	7.98	1.54	0.60	2.59	10.16	4.10	3.87	2.65	2.14	2.73	0.89
2005	32.70	19.72	0.81	7.11	2.06	3.58	2.17	9.13	3.94	3.39	2.36	2.03	2.99	1.18
2006	33.88	21.02	1.03	7.54	2.15	3.75	2.04	10.38	3.73	3.25	2.76	1.95	3.72	1.10
2007	35.72	20.66	1.03	8.54	2.44	4.72	1.92	8.28	3.70	1.91	2.91	2.23	3.76	0.97
2008	35.76	20.25	1.13	7.92	2.68	7.44	1.76	8.31	3.39	1.65	2.79	2.78	2.94	1.07
2009	38.18	18.80	1.82	7.63	4.20	8.35	1.68	7.51	3.73	2.98	3.15	2.74	3.95	1.08
2010	38.06	18.59	1.65	7.12	3.74	8.76	1.82	10.33	3.39	2.53	3.16	2.20	3.25	1.12
2011	38.62	19.29	2.05	5.96	4.34	9.82	1.74	8.74	3.51	2.49	3.30	1.92	2.53	1.16
2012	40.11	19.69	2.07	5.77	3.97	8.32	1.42	9.14	3.71	2.60	3.16	2.13	2.88	1.28
2013	35.57	17.21	2.27	4.97	4.21	9.03	1.70	10.49	3.79	2.76	2.86	2.25	2.34	1.45
2014	35.42	15.51	2.81	4.90	3.87	9.13	1.52	9.56	3.65	3.40	2.59	1.93	1.99	1.52
2015	39.86	17.16	2.76	5.19	4.72	8.65	1.15	10.42	4.04	3.52	3.27	1.85	1.83	1.51
2016	36.70	16.95	2.42	4.57	3.69	8.40	1.05	10.02	3.99	3.18	3.53	1.92	1.84	1.50
2017	37.36	12.13	2.83	3.83	3.92	5.72	1.24	10.03	3.81	3.35	2.79	2.27	1.33	1.55
2018	37.54	15.10	2.21	3.79	5.24	3.04	2.36	10.31	3.31	2.54	2.61	2.20	1.22	1.47

Source: United Nations Comtrade

Table 1.25 presents the contribution of the sub-categories within commodity 19. In recent years, sub-category 1905 has almost 50% of the total, while sub-category 1904 has less than 10%. Further, the share of 1904 has dropped from 18.6% in 1996 to 7.6% in 2018. The combined share of the other sub-categories within commodity 19 has increased despite the RCA of these commodities being less than 1.0.



**Table 1.25. Four-digit HS Share Distribution of Commodity 19**

YEAR	1904	1905	OTHERS	TOTAL
1996	18.6	48.2	33.3	100.0
1997	47.3	31.5	21.2	100.0
1998	34.1	29.1	36.8	100.0
1999	44.6	24.2	31.2	100.0
2000	31.7	25.9	42.4	100.0
2001	22.2	17.7	60.1	100.0
2002	18.8	21.1	60.1	100.0
2003	23.4	25.3	51.3	100.0
2004	17.8	26.4	55.9	100.0
2005	18.6	33.3	48.1	100.0
2006	19.4	29.3	51.3	100.0
2007	19.7	23.8	56.6	100.0
2008	15.0	24.9	60.1	100.0
2009	21.6	25.0	53.4	100.0
2010	18.0	24.7	57.4	100.0
2011	15.3	25.5	59.1	100.0
2012	13.6	27.1	59.2	100.0
2013	9.8	29.0	61.2	100.0
2014	9.5	38.0	52.5	100.0
2015	9.3	40.4	50.4	100.0
2016	11.1	46.8	42.1	100.0
2017	7.9	47.6	44.5	100.0
2018	7.6	48.7	43.7	100.0

Source: UN Comtrade

### ***Revealed Comparative Advantage of Philippine Agri-Fishery-Food Relative to ASEAN***

ASEAN is also critical for Philippine trade because the regional market has now evolved into the ASEAN Economic Community. Information on the competitiveness of Philippine agri-fishery-food commodities relative to ASEAN is therefore relevant.

Table 1.26 presents the RCA estimates for Philippine agri-fishery-food commodities relative to ASEAN. Out of the 25 commodities in Table 1.10, the Philippines has revealed comparative advantage only in five commodities: 13 (lac; gums, resins and other vegetable saps and extracts), 08 (edible fruit and nuts; peel of citrus fruit or melons), 20 (preparations of vegetables, fruits, nuts or other parts of plants), 24 (tobacco and manufactured tobacco substitutes), and 16 (preparations of meat, of fish or crustaceans, mollusks or other aquatic invertebrates). Commodities 15 (animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes) and 03 (fish and crustaceans, mollusks and other aquatic invertebrates), which have comparative advantage in the world market, do not have comparative advantage in ASEAN. Also, commodity 19 (preparations of cereals, flour, starch or milk; pastrycooks' products), which has comparative advantage relative to a larger regional market in RCEP, does not have comparative advantage in ASEAN.

Within ASEAN the RCA estimates for commodity 13 are higher compared to the estimates in Table 1.11 (relative to the world) and in Table 1.22 (relative to RCEP). Commodity 08 has high RCA estimates of more than 4.0, while commodity 20 has more than 3.0. The trend of the RCA estimates for commodity 24 is similar in Table 1.11 (relative to the world) and Table 1.22 (relative to RCEP); i.e., increasing initially less than 1.0 to more than 2.0 in recent years. The RCA estimates for commodity 16 are smaller to the other commodities in Table 1.25.



**Table 1.26: Two-digit HS Revealed Comparative Advantage of Philippine Agri-fishery-Food Commodities Relative to ASEAN**

YEAR	TWO-DIGIT HS				
	13	08	20	24	16
1996	5.69	5.48	2.20	0.74	1.11
1997	6.89	5.91	3.20	0.35	1.45
1998	6.02	6.23	3.03	0.34	1.68
1999	7.66	7.14	2.79	0.58	1.32
2000	6.33	5.94	3.07	0.62	0.92
2001	6.57	6.26	3.07	0.71	0.95
2002	7.22	6.74	3.01	0.66	1.17
2003	6.97	6.56	2.90	0.89	1.10
2004	7.13	6.35	2.82	1.85	0.96
2005	6.44	5.86	2.75	1.92	0.94
2006	6.98	6.51	2.78	1.97	0.89
2007	8.09	6.94	3.03	2.12	1.06
2008	9.79	7.52	2.95	2.55	1.33
2009	10.83	7.73	3.23	3.00	1.24
2010	10.92	7.11	2.96	2.94	1.05
2011	11.13	7.20	3.19	3.10	0.91
2012	10.24	6.48	3.57	2.65	1.09
2013	9.04	6.26	3.35	2.70	1.10
2014	9.94	6.21	3.18	2.57	0.99
2015	10.29	5.14	3.35	2.36	0.99
2016	9.78	4.54	3.13	2.12	0.97
2017	8.30	3.88	3.14	1.99	1.12
2018	7.85	4.67	2.78	2.63	1.14

Source: United Nations Comtrade

Table 1.27 presents the four-digit RCA estimates of commodities in Table 1.26. In commodity 13, relative to ASEAN, sub-category 1302 (vegetable saps and extracts; pectic substances, pectinates and pectates; agar agar and other mucilage and thickeners, whether or not modified, derived from vegetable products) has high RCA estimates. In commodity 08, sub-categories 0803 (bananas, including plantains, fresh or dried); 0804 (dates, figs, pineapples, avocados, guavas, and mangoes and mangosteens, fresh or dried); 0811 (fruit and nuts, uncooked or cooked by steaming or boiling in water, frozen, whether or not containing added sugar or other sweetening matter); and 0812 (fruit and nuts, provisionally preserved, for example, by sulphur dioxide gas, in brine, in sulphur water, or in other preservative solutions), but unsuitable in that state for immediate consumption), have high RCA estimates. There is only one sub-category in commodity 20 which has high RCA estimates. This is 2008 (fruit, nuts, and other edible parts of plants, otherwise prepared or preserved, whether or not containing added sugar or other sweetening matter or spirit, not elsewhere specified or included). RCA for commodity 24 shows a similar pattern in estimates relative to ASEAN, to the world, and to RCEP. The sub-categories of commodity 16 (1604 and 1601) have relatively lower RCA estimates compared to the other commodities in the list.

**Table 1.27: Four-digit HS Revealed Comparative Advantage of Philippine Agri-fishery Food Commodities Relative to ASEAN**

YEAR	FOUR-DIGIT HS										
	1302	0803	0804	0811	0812	2008	2401	2403	2402	1604	1601
1996	7.82	9.54	7.96	1.45	1.10	2.65	1.09	0.63	0.13	1.64	0.78
1997	10.20	13.19	9.84	1.46	0.38	3.84	1.59	0.10	0.12	2.46	0.05
1998	8.73	12.01	9.38	0.86	0.37	3.60	1.60	0.19	0.04	2.60	0.14
1999	10.36	13.59	10.62	0.56	0.13	3.43	2.21	0.12	0.19	2.13	0.39
2000	8.46	13.42	9.55	0.44	0.46	3.91	1.79	0.27	0.35	1.79	1.19
2001	9.01	13.52	9.61	0.56	1.07	3.61	1.70	0.32	0.43	1.55	1.94
2002	9.41	13.73	9.61	0.62	0.58	3.58	1.77	0.07	0.47	1.87	0.45
2003	9.24	13.61	9.59	0.84	1.21	3.47	1.34	0.36	0.82	1.73	0.28
2004	9.47	13.75	10.51	0.99	0.52	3.29	1.45	0.40	2.45	1.62	0.71
2005	8.25	13.54	9.96	1.48	0.84	3.19	1.81	2.13	1.92	1.44	1.79
2006	9.27	14.50	11.07	1.96	1.10	3.21	1.86	2.54	1.93	1.48	1.64
2007	11.73	16.36	11.55	2.46	0.73	3.73	2.28	3.44	1.85	1.82	5.48
2008	12.53	18.07	12.49	3.29	1.43	3.63	2.87	5.82	1.82	2.26	4.21
2009	13.48	18.65	11.22	4.29	1.65	4.01	4.66	6.39	1.65	2.05	1.82
2010	13.57	18.55	11.19	3.98	0.78	3.79	4.13	7.04	1.75	1.74	2.54
2011	13.74	18.99	12.08	5.22	0.68	3.89	5.19	8.11	1.60	1.56	1.90
2012	13.44	19.66	11.73	4.91	0.84	4.52	4.38	6.02	1.32	1.70	2.68
2013	12.01	17.98	9.69	4.55	1.34	4.27	4.59	6.87	1.40	1.72	1.21
2014	12.52	18.08	9.02	4.17	2.19	4.00	4.18	6.77	1.29	1.51	1.42
2015	13.24	18.90	9.79	3.34	1.43	4.24	4.77	7.15	1.07	1.50	1.68
2016	12.52	17.48	10.02	2.83	1.97	4.03	4.42	6.74	1.00	1.57	1.71
2017	10.52	18.15	6.95	2.96	1.82	3.92	4.71	5.31	1.07	1.86	1.37
2018	9.81	17.79	8.55	1.84	0.55	3.63	5.46	4.51	1.92	1.82	0.94

Source: United Nations Comtrade

## Philippine Poverty and Agri-Fisheries Sector Transformation

Executive Order (EO) No. 5 adopted the *Ambisyon Natin 2040* as the long-term vision for the Philippines. Below are two quotes from Sections 1 and 2 of EO 5, highlighting the primary goal of the long-term vision.

Section 1: “By 2040, the Philippines shall be a prosperous, predominantly middle-class society where no one is poor; our peoples shall live long and healthy lives, be smart and innovative, and shall live in a high-trust society.”

Section 2: “Overall Long-Term Goals. The Philippine Government hereby aims to triple real per capita income and **eradicate hunger and poverty by 2040**, if not sooner...”

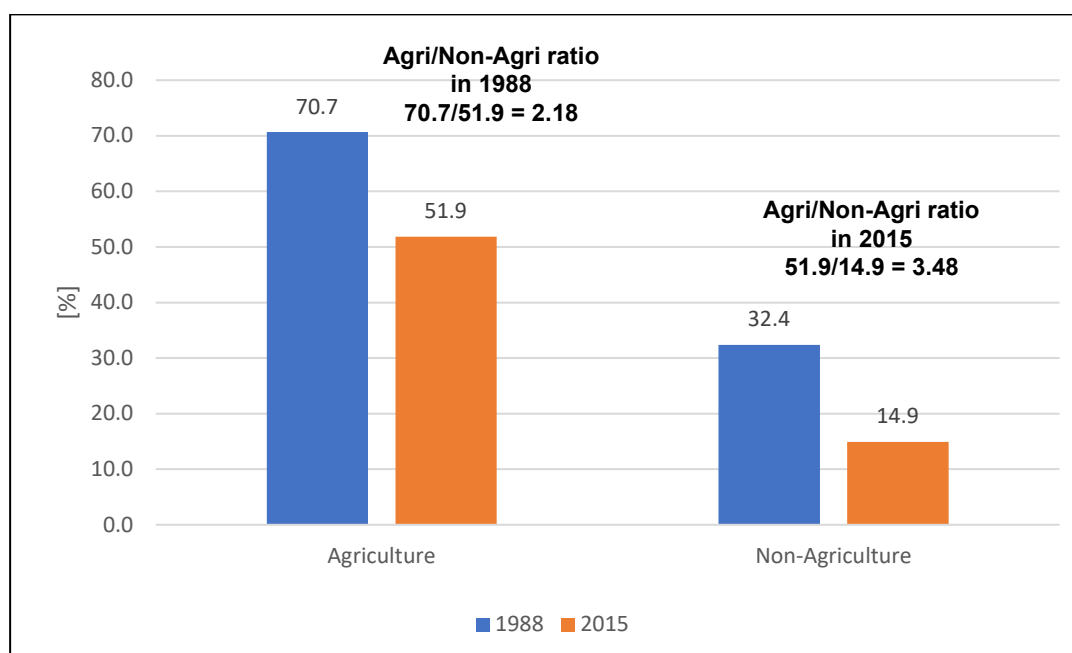
It is difficult to eradicate poverty in the Philippines by 2040 if challenging issues in the following areas are not addressed and resolved: (1) agri-fisheries sector transformation; (2) high population growth; and (3) education. While this section focuses mainly on agri-fisheries sector transformation, issues related to family size and education will only be mentioned in passing, as they will require deeper analysis and are therefore beyond the scope of this paper.

### Poverty

Figure 1.27 presents poverty incidence in agri-fisheries and non-agri-fisheries in the Philippines between 1988 and 2015. During this period, poverty in both sectors dropped. However, the drop is not proportional. The drop in poverty incidence in non-agri-fisheries was larger than in agri-fisheries. This can be observed by taking the poverty ratio: agri-

fisheries/non-agri-fisheries in 1998 and 2015. In 1988 the ratio is  $70.7/32.5=2.18$ , while in 2015 the ratio is  $51.9/14.9=3.48$ .

**Figure 1.27: Philippine Poverty Incidence: Agri-Fisheries and Non-Agri-Fisheries**



Source: FIES, PSA

Since 3.48 in 2015 is significantly larger than 2.18 in 1988, the poverty gap in agri-fisheries and non-agri-fisheries widened over the years. That is, poverty reduction in agri-fisheries has lagged behind non-agri-fisheries.

Table 1.28 presents the structure of poverty in the country in terms of family size and agri-fisheries/non-agri-fisheries between 1991 and 2015. Between these years, the poverty incidence of a family in agri-fisheries with only one member dropped by -77.1%. The rate of reduction in the poverty incidence declines significantly as the size of the family expands. In particular, in a family of nine members or more, the decline in the poverty incidence is -15.5% between 1991 and 2015.

**Table 1.28: Poverty, Family Size, and Agri-fisheries and Non-agri-fisheries**

FAMILY SIZE	AGRI-FISHERIES (a)			NON-AGRI-FISHERIES (b)			RATIO: (b)/(a)
	1991	2015	% Change	1991	2015	% Change	
1	21.4	4.9	-77.1	10.3	2.1	-79.5	1.0
2	34.5	14.7	-57.5	16.4	3.6	-78.2	1.4
3	47.6	19.6	-58.8	14.2	4.6	-67.8	1.2
4	57.5	35.2	-38.7	19.6	7.3	-62.7	1.6
5	69.2	51.9	-25.0	25.0	11.9	-52.4	2.1
6	80.3	62.7	-21.9	30.3	18.9	-37.5	1.7
7	79.1	69.6	-12.1	38.8	22.5	-41.9	3.5
8	85.7	76.6	-10.5	45.6	28.4	-37.8	3.6
9 and up	89.9	75.9	-15.5	44.5	29.3	-34.1	2.2

Source: FIES

A similar pattern is observed under non-agri-fisheries across the various levels of education of household head. However, the rate of reduction in poverty incidence is higher under non-agri-fisheries compared to agri-fisheries as indicated by the column Ratio: (b)/(a). Further, the ratio indicates that families with larger family size have generally higher reduction in poverty incidence in non-agri-fisheries than in agri-fisheries.

Table 1.29 compares the poverty incidence in agri-fisheries and non-agri-fisheries between 1991 and 2015 under various levels of educational attainment of household heads. One can observe that the lower the educational level of the head of household, the lower the rate of reduction in poverty incidence between 1991 and 2015. For example, under agri-fisheries, in a family where the head has not completed any education, the reduction in poverty incidence is -6.7% between 1991 and 2015. For a family where the head has educational level of college undergraduate and higher, the reduction in poverty is significantly higher at -44.9% over the same period.

**Table 1.29: Poverty, Education, and Agri-fisheries and Non-agri-fisheries**

EDUCATION (head)	AGRI-FISHERIES (a)			NON-AGRI-FISHERIES (b)			RATIO: (b)/(a)
	1991	2015	% Change	1991	2015	% Change	
No Grade Completed	76.9	71.7	-6.7	46.0	40.1	-12.8	1.9
Elementary Undergraduate	74.8	59.4	-20.6	46.1	29.8	-35.4	1.7
Elementary Graduate	76.0	47.5	-37.4	40.7	21.2	-47.7	1.3
High School Undergraduate	71.7	48.0	-33.0	37.4	19.9	-46.9	1.4
High School Graduate	63.9	37.3	-41.5	26.6	10.2	-61.7	1.5
College Undergraduate and Higher	46.9	25.9	-44.9	8.9	3.5	-60.6	1.3

Source: FIES

A similar pattern is observed under non-agri-fisheries across the various levels of education of household heads. However, the rate of reduction in poverty incidence is higher under non-agri-fisheries compared to agri-fisheries as indicated by the column Ratio: (b)/(a). Further, the ratio indicates that a family where the head has low educational attainment has a higher rate of reduction in poverty incidence in non-agri-fisheries than in agri-fisheries.

Thus, Tables 1.28 and 1.29 highlight the three major issues related to poverty: agri-fisheries; family size; and education. This section further analyzes the issues related to poverty and agri-fisheries. Family size, which is related to population, and education are two complex issues which require deeper analysis; and are therefore beyond the scope of this section.

In the literature on poverty, it is critical to have information on two types of poverty: chronic poverty and transient poverty. Each requires a different set of policies. Chronic poverty is defined as a state whereby an individual or family is under poverty (poor) over an extended period. Thus, if an individual or family is under poverty (poor) in one period, it is expected that the individual or family will remain in poverty (poor) in the following period. This is also referred to as structural poverty, which requires long-term poverty alleviation policies and programs.

On the other hand, transient poverty is defined as a state where an individual or a family is depending upon the variability/fluctuation in income/consumption. That is, a family or individual may fall under poverty during economic slowdown, natural calamities, public health; or move out of poverty during recovery. For this type of poverty, an income stabilization program is needed to temporarily assist an individual or family so that it can move out of poverty.

There is no official data on chronic and transient poverty in the Philippines. This is mainly because of the absence of longitudinal/panel household income and expenditure survey. What is available in the Philippines is the Family Income and Expenditure Survey (FIES), which provides cross sectional data on households gathered every three years since 1985. In each year when the survey is rolled out, different households are surveyed.

However, the development of pseudo-panel statistical technique in the literature addresses the gap due to the absence of panel household data. The basic idea of the pseudo-panel statistical technique is to run regression across cohorts over time and to analyze the error terms of the regression results. Under certain assumptions, one can recover/infer the behavior of the individuals in each cohort from the error of the regressions.

Cororaton (2021) adopted and applied this statistical technique to the FIES data from 1991 to 2015. The results are presented in Table 1.30. The results indicate that about 15% of poverty in the Philippines is transient, and 85% chronic.

**Table 1.30: Poverty: Chronic and Transient**

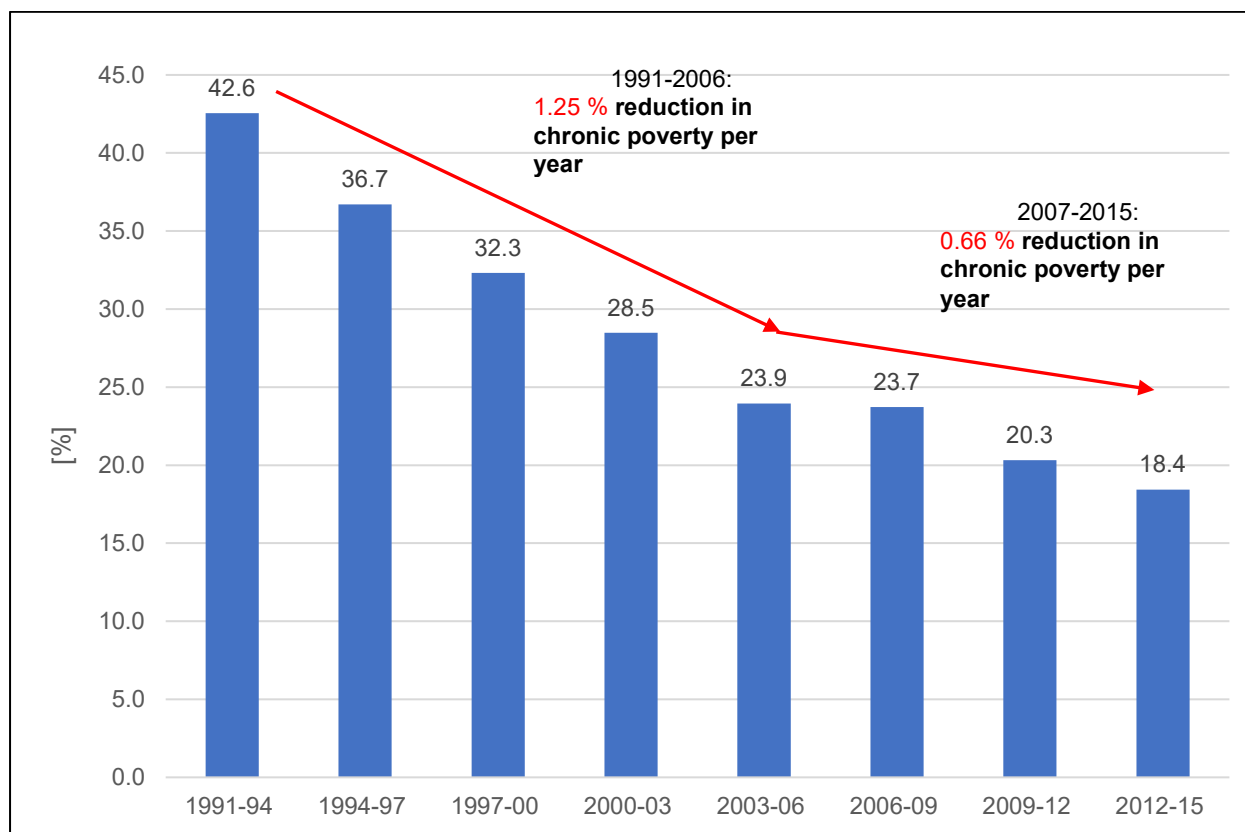
PERIOD	POVERTY INCIDENCE, %	SHARE, %		
		Always Poor	Sometimes Poor	Total
1991-94	47.1	90.3	9.7	100.0
1994-97	41.6	88.3	11.7	100.0
1997-00	37.0	87.2	12.8	100.0
2000-03	32.4	87.9	12.1	100.0
2003-06	27.8	86.1	13.9	100.0
2006-09	26.9	88.4	11.6	100.0
2009-12	23.8	85.5	14.5	100.0
2012-15	21.4	86.2	13.8	100.0
Average		87.5	12.5	

Cororaton, 2021

Figure 1.28 presents the pattern of chronic poverty in the country. Between the span from 1991 to 2015, two periods need to be highlighted: (1) 1991-2006 when chronic poverty declined by 1.25% per year; and (2) 2007-2015 when chronic poverty declined by 0.66% per year. This indicates that the rate of reduction in chronic poverty decelerated by more than half from period (1) to period (2). This is a major concern because, given this rate of reduction and assuming 20% poverty incidence in 2021,<sup>3</sup> at 0.66% per year reduction in poverty, the poverty incidence will decline to only 17.6% by 2040, which is far from the goal of achieving zero poverty by 2040 as stated in the long-term development plan under the *Ambisyon Natin 2040*. Moving forward, therefore, the major challenge is how to reduce the trajectory of the rate of decline in poverty incidence so the vision in *Ambisyon Natin 2040* is achievable. Addressing key issues in agri-fisheries is critical since the development of the sector is an important factor affecting poverty.

<sup>3</sup> In 2018 the official poverty incidence was 16.7%. Because of the pandemic (COVID-19) and the lockdown, the poverty incidence can easily bounce back to 20% in 2021.

**Figure 1.28: Pattern of Chronic Poverty**



Cororaton 2021

### **Poverty and Support to Agri-Fisheries**

As cited earlier, one of the major factors affecting poverty in the Philippines is the development (or lack of development) in agri-fisheries. As highlighted in the previous sections, there is the absence of diversity in commodity production in agri-fisheries. The sector is largely dominated by *palay* production, which receives a significant amount of support in the form of market price support as discussed in the previous section. As a result, growth in the food manufacturing sector (which is supposed to be closely linked with domestic agri-fisheries) deviated from the growth in agricultural sector growth. In the period 2000-2009, agri-fisheries expanded by 3.7% per year, while food manufacturing grew by 4.3% per year. In the period 2010-2019, agri-fisheries grew by 1.9% per year, while food manufacturing grew by 4.3% per year. Thus, in the period 2010-2019, the share of agri-fisheries to GDP dropped from 14% to 8.8, while the share of food manufacturing remained generally stable between nine percent and 10%. These trends imply that in the last decade, because of declining share of agri-fisheries due to lack of product diversification within the sector, the food manufacturing sector has shifted its source of raw materials for processing from domestic agri-fisheries to imports.

Table 1.31 compares the structure of production in agri-fisheries and the structure of support to agri-fisheries. As discussed in the previous sector, the total support to agri-fisheries is about three percent of GDP (PHP465 billion in 2019). More than 90% of this support is in the form of market price support, which is largely paid by transfers from the consumer in the form of higher prices.

*Palay* production, which dominates agri-fisheries, is getting the largest share of the support to the sector. Pork and poultry products, which have a combined share in production of more than 20%, also are getting more than 20% of the support. However, sugar, which has a tiny

and declining share in agricultural production, is getting more than 12% of the support to agri-fisheries. Banana, which has an increasing share in production as well as high revealed comparative advantage (RCA) discussed in the previous section, is getting zero support. Coconut and other fruits have high RCA estimates, yet they receive zero support. Corn, which has an increasing share in production, receives zero support.

The asymmetry between production and support in agri-fisheries is one of the reasons behind the absence of diversity in production in agri-fisheries. Thus, the asymmetric incentive system in agri-fisheries needs to be addressed. The support to agri-fisheries needs to be realigned to assist the production of commodities which have comparative advantage. As identified in the previous section, these commodities are non-staple (not rice/*palay*) or non-traditional (not sugar) crops.

**Table 1.31: Agri-fisheries: Production Structure and Support**

AGRI-FISHERIES PRODUCTION STRUCTURE			SUPPORT TO AGRI-FISHERIES /1		
	2009-2010	2018-2019		2009-2010	2018-2019
Crops	46.3	50.7	Rice	37.1	48.2
<i>Palay</i>	17.2	19.6	Pork	23.0	18.7
Banana	6.9	8.4	Sugar	12.3	12.9
Corn	4.9	5.5	Poultry	10.3	10.1
Other agri. crops	4.7	5.2	Other MPS /2	12.7	8.4
Coconut	5.3	4.3	Beef and veal	1.2	1.0
Mango	1.4	1.9	Eggs	0.9	0.8
Pineapple	0.9	1.7	Bananas	0.0	0.0
Sugarcane	1.9	1.6	Coconut	0.0	0.0
Cassava	1.0	1.3	Mango	0.0	0.0
Rubber	1.4	0.6	Pineapple	0.0	0.0
Coffee	0.4	0.3	Maize	2.4	0.0
Abaca	0.1	0.1	<b>Total</b>	<b>100.0</b>	<b>100.0</b>
Cacao	0.1	0.1			
Tobacco	0.1	0.1			
Livestock	16.2	13.6			
Poultry and egg	9.9	10.1			
Other animal	1.5	3.1			
Forestry and logging	0.4	0.2			
Fishing and aquaculture	18.4	13.0			
Support activities	7.3	9.6			
<b>Total</b>	<b>100.0</b>	<b>100.0</b>			

Source: NIA, PSA, OECD

/1 OECD

/2 Largely market price support

As highlighted earlier in the section on agri-fisheries support, the largest item is market price support (more than 90% of the total). Also highlighted is the fact that the support is financed largely by transfers from consumers (more than 95%).

One of the major effects of the very high support to *palay* production is the expensive price of rice for consumers. Figure 1.29 compares the domestic price of rice of Class C (35% broken) price of rice of similar quality in Vietnam and Thailand. In 2014-2015, the average price difference between Philippine and Thai rice reached a peak of 108%, and between Philippine



and Vietnamese rice 122%. In 2016-2018, the average price difference was 83.2% between Philippine and Thai rice, and 106.6% between Philippine and Vietnamese rice. In 2019-2020 when the rice liberalization law was first implemented, the average price difference declined further to 53.9% between Philippine and Thai rice, and 90% between Philippine and Vietnamese rice. One should note that a large part of Philippine rice imports comes from Vietnam.

**Figure 1.29: Domestic Price of Rice vs. External Price**

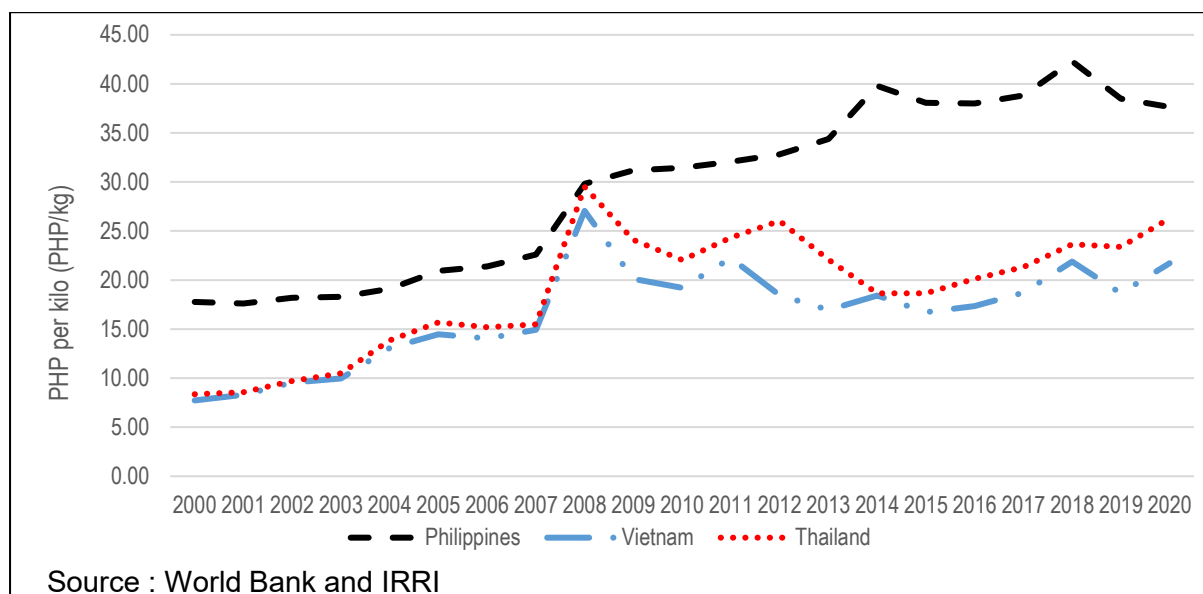


Table 1.32 shows who among the Filipino consumers are shouldering the support to agri-fisheries. The FIES data in the table indicates the structure of food expenditure, rice expenditure, and poverty incidence across households grouped in decile.

The bottom 20% of the population with poverty incidence of more than 70% has the highest ratio of food expenditure to total expenditure (more than 60%) as well as on rice expenditure to total expenditure (18%). On the other hand, the top 20% with practically zero poverty spends 3-6% of its total expenditure on rice, and about 30% on food in general. These numbers indicate that ironically, the poorest Filipinos are the ones shouldering the support to agri-fisheries.

**Table 1.32: Household Expenditure, Income Source and Poverty**

	FOOD/TOTAL EXPENDITURE (%)			RICE/TOTAL EXPENDITURE (%)			POVERTY INCIDENCE (%)		
	2009	2012	2015	2009	2012	2015	2009	2012	2015
First decile	61.7	62.6	60.4	19.7	19.6	17.8	78.7	77.6	72.6
Second decile	60.6	61.7	58.9	20.5	20.1	17.7	73.1	73.0	64.5
Third decile	58.9	59.6	57.5	19.1	18.7	16.7	60.1	57.2	48.4
Fourth decile	56.6	57.6	55.1	17.1	16.6	15.2	43.2	39.6	33.7
Fifth decile	54.1	54.8	52.3	15.0	14.3	13.4	25.0	22.2	19.1
Sixth decile	50.9	51.7	49.5	12.4	12.2	11.5	11.4	10.4	8.2
Seventh decile	47.4	48.3	46.6	10.2	9.9	9.8	3.0	3.4	3.4
Eighth decile	43.4	43.4	42.9	8.1	7.8	8.0	0.2	0.9	0.4
Ninth decile	38.5	39.0	37.9	6.3	6.1	6.2	0.1	0.1	0.0
Tenth decile	29.1	29.6	28.9	3.6	3.4	3.6	0.0	0.0	0.0
<b>All</b>	<b>43.1</b>	<b>44.1</b>	<b>43.0</b>	<b>9.5</b>	<b>9.4</b>	<b>9.2</b>	<b>26.3</b>	<b>25.0</b>	<b>21.5</b>



### Poverty Impact of Lower Domestic Price of Rice

Figure 1.30 summarizes the huge gaps in the share of rice in total expenditure of poor and non-poor households in 2009 to 2018. The average share of rice expenditure is about 20% to total expenditure for poor households, and six percent for non-poor.

**Figure 1.30: Share of Rice in Total Expenditure**

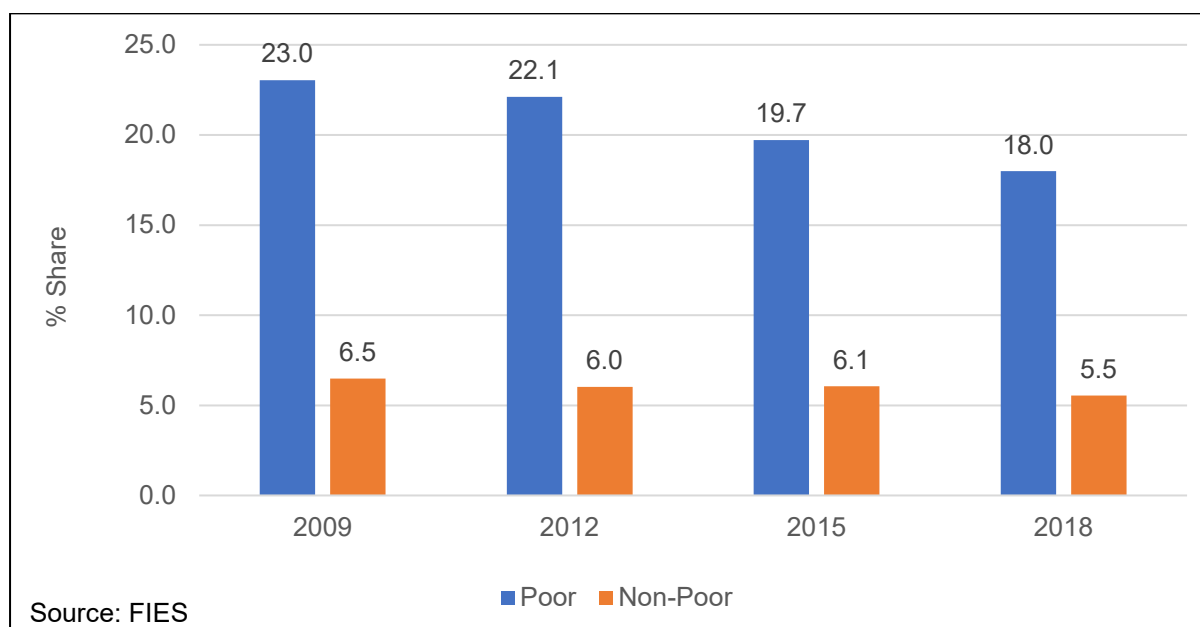


Table 1.33 summarizes the price difference in the domestic price of rice in the Philippines and the reference external price, which is the price of Vietnam, a major source of Philippine rice imports. The price is for class C, which is the price for 25% broken.

This section provides estimates of the poverty impact of the high domestic prices of rice in the country. Table 1.33 also presents two scenarios: Scenario 1 where the rice price difference between the Philippines and the Vietnam reference price is reduced by half; while Scenario 2 where the price difference between the two is eliminated.

The analysis uses data from FIES in 2009, 2012, 2015 and 2018. Household income is retained in the analysis. The rice price adjustment is implemented in the value of the poverty threshold as the reduction in the price of rice lowers the value of expenditure of households, but the price adjustment is weighted using the rice share in total expenditure of households.

**Table 1.33: Price Difference, Philippines and Vietnam**

YEAR	COUNTRY		PRICE DIFFERENCE, Philippines and Vietnam		
	Philippines*	Vietnam*	Actual	Scenario 1**	Scenario 2***
2009	31.2	20.1	54.9	27.5	0.0
2012	32.8	18.4	78.0	39.0	0.0
2015	38.1	16.7	127.8	63.9	0.0
2018	42.3	21.9	93.4	46.7	0.0

Source\*: World Bank and IRRI

Scenario 1\*\*: 1/2 of actual

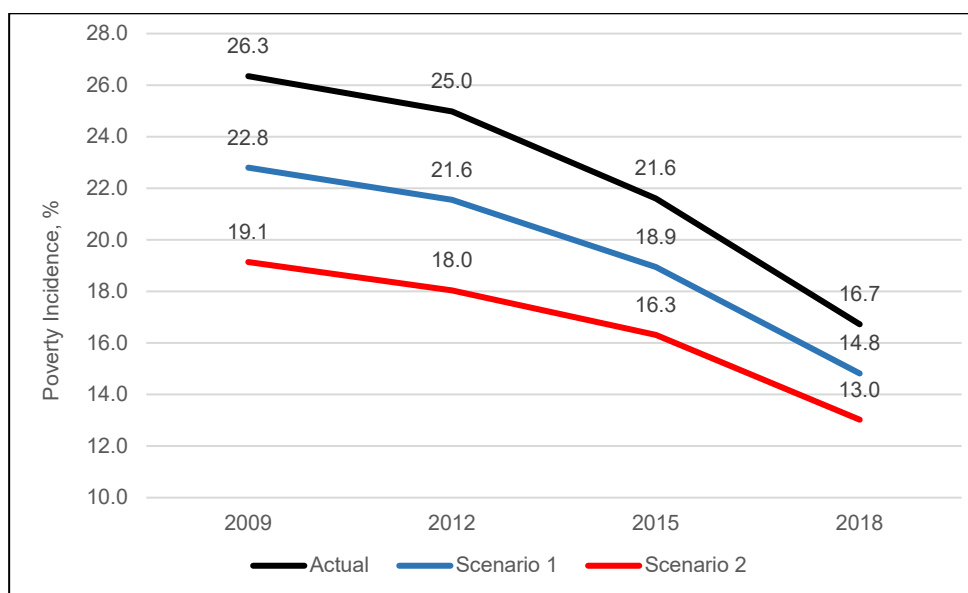
Scenario 2\*\*\*: Philippine and Vietnam prices are equal

Figure 1.31 presents actual poverty incidence in 2009, 2012, 2015, and 2018, and compares the poverty incidence in scenario 1 where the price difference is reduced by half and in scenario 2 where the price difference is eliminated. In 2018, if the price difference is cut by half, the poverty incidence could have dropped to 14.8%, instead of 16.7%. If the price difference is eliminated, the poverty incidence could have dropped further to 13.0%.

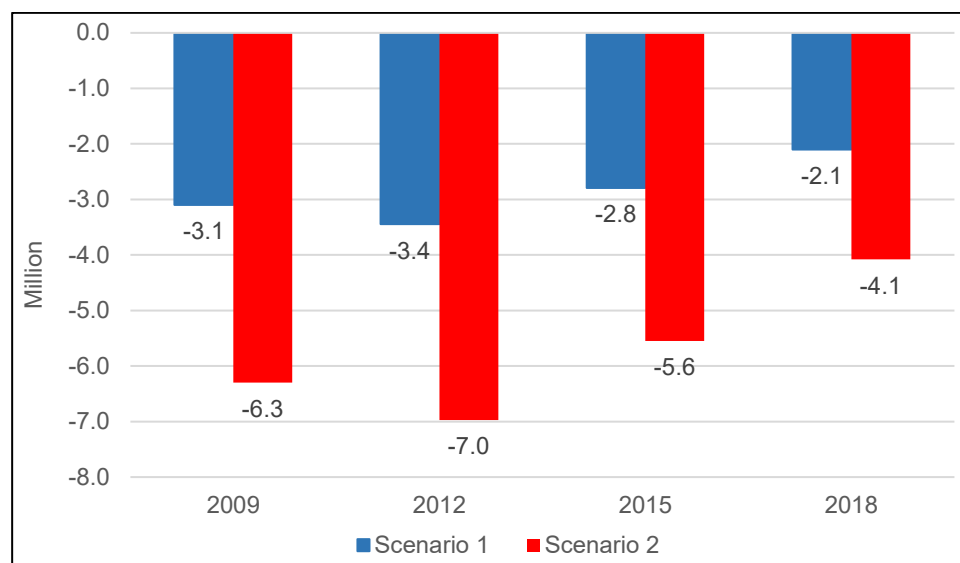
Figure 1.32 presents the reduction in the number of poor under scenarios 1 and 2. In 2018, about 2.1 million poor people could have gone above the poverty threshold if the price difference is cut into half under scenario 1, and about 4.1 million poor people could have passed beyond the poverty line if the price difference is eliminated.

The results of the two scenarios indicate that the trajectory of the poverty incidence from 2009 to 2018 could have been much lower compared to the actual, and the number of poor people could have been fewer had the issue on the high domestic price of rice was addressed.

**Figure 1.31: Poverty Impact of Lower Domestic Price of Rice**



**Figure 1.32: Reduction in Number of Poor under Lower Domestic Price of Rice**



### Outmigration of Labor in Agri-Fisheries

The previous sections highlight the significant outmigration of labor from agri-fisheries. Several factors contribute to this development, which include surplus labor in agri-fisheries; low employment productivity; absence of diversity in commodity production largely due to the incentive system that supports staple (*palay*) and traditional crop (sugar); and high poverty incidence. A significant part of agricultural labor outmigrated to services sectors as well as to some sectors in industry.

Table 1.34 provides indicators where agri-fisheries labor likely moved to. The indicators in the table include educational attainment (type 1: no education to high school graduate; and type 2: post high school and up), and employment productivity measured as a ratio between sectoral gross value added and the corresponding sectoral employment in PHP thousand in 2018 prices.

**Table 1.34: Likely Sectoral Destination of Outmigrating Agri-Fisheries Labor**

	NO EDUCATION TO HI-SCHOOL GRAD.	POST HIGH SCHOOL	TOTAL	GVA/ EMPLOYMENT, P1000, 2018 PRICES
Agri-fisheries				
Fishing	78.6	21.4	100	132
Agriculture	75.3	24.7	100	123
Services				
Other household services	53.2	46.8	100	34
Land Transportation	42.2	57.8	100	100
Retail	38.0	62.0	100	258
Public Administration	16.5	83.5	100	269
Utilities	15.8	84.2	100	2,646
Professional	3.4	96.6	100	2,934
Finance	3.1	96.9	100	1,896
Industry				
Mining	63.4	36.6	100	679
Construction	52.5	47.5	100	296
Wearing Apparel, textile	39.3	60.7	100	196
Food Manufacturing	37.2	62.8	100	1,507
All Manufacturing	35.0	65.0	100	730
Electronics	3.4	96.6	100	844

Source: LFS, NIA, PSA

It is highly unlikely that outmigrating agri-fisheries labor with type 1 labor quality can move to non-agri-fisheries sectors with type 2 labor quality (such as professionals, finance, electronics, food manufacturing), and where employment productivity is high. Instead, it is most likely that outmigrating agri-fisheries labor will move to sectors where employment is also type 1 labor quality (such as other household services, retail trade, land transportation and construction) and where employment productivity is also low. If the outmigrating agri-fisheries labor moves to sectors in urban areas where the employment productivity is equally low, it implies shifts in rural to urban poverty, which generates a whole range of complicated issues that are beyond what this paper can tackle.

## Insights

The objective of the paper is to examine the structure of agri-fisheries and its link with food manufacturing to draw lessons for its future and long-term growth. The paper uses historical data to examine the trends in production of agri-fisheries commodities. The paper also examines the structure of support to agri-fisheries—which crop production is getting the most support and who is paying for the support. Comparative advantage is critical to the growth of agri-fisheries in the long run. Thus, the paper identifies which commodities have revealed comparative advantage (RCA). RCA can provide information on export potential of commodities. The paper also examines the poverty-agri-fisheries link to draw insights on the long-term vision of the country of zero poverty by 2040.

Agri-fisheries has lagged behind industry and services over the years. Thus, the share of agri-fisheries to GDP showed consistent decline from 14.0% in 2000 to 8.3% in 2019.

Agri-fisheries is not diversified in terms of production. About half of agri-fisheries is in the production of crops. About 40% of crops are in the production of *palay*, and its share is increasing over time. While the share of banana production has increased, the shares of the rest of agricultural crops are declining.

Agri-fisheries provides raw materials to the food manufacturing sector for processing into final consumable commodities. Based on historical data, the link between the two sectors has declined as indicated by the divergence of their growth. In 2000-2009, agri-fisheries expanded by an average of 3.7% per year, while food manufacturing grew by an average of 4.3% per year.

However, in 2010-2019, agri-fisheries grew by an average of 1.9% per year, while food manufacturing did by an average of 4.3% per year. This implies that in the last decade, because of declining share of agri-fisheries due to lack of product diversification within the sector (dominated largely by *palay* production), the food manufacturing sector has sustained its growth by shifting its source of raw materials for processing from domestic agri-fisheries to imports. Compared to neighboring countries, except for the production of livestock, the Philippines lags behind in the production of crops and food.

The agri-fisheries sector receives a substantial amount of support representing about three percent of GDP. In 2019, the total support for agri-fisheries amounted to PHP465 billion. Almost 90% of the support is in the form of market price support, which implies that the consumers are paying for the support.

Almost 50% of the support goes to *palay* production; 30% to pork and poultry; and 13% to sugar production. On the other hand, support for coconut, banana, and other vegetable and fruit crops is zero. The lack of diversity in crop production in agriculture may be attributed to the incentive system that largely favors staple (rice) and traditional (sugar) production.

The estimates of RCA indicate that relative to the world market, out of 25 agri-fishery-food commodities in a two-digit harmonized system (HS), the Philippines has a comparative advantage in seven commodities. Relative to the regional market in the Regional Comprehensive Economic Partnership (RCEP), the Philippines is comparable in seven commodities. However, relative to the market in the Association of Southeast Asian Nations (ASEAN), the Philippines has comparative advantage in five commodities.

Tables 1.35, 1.36, and 1.37 list the commodities where the Philippines has comparative advantage.

The support to rice and sugar accounted to more than 60% of the total support to agri-fisheries. These two commodities are not in the list where the Philippines has comparative advantage. Adjustment and restructuring of the incentive system in agri-fisheries may therefore be necessary so commodities where the Philippines has comparative advantage may be supported and promoted. Adjustment in the incentive system may help diversify production in agri-fisheries.

**Table 1.35: Relative to the World, Two-digit HS**

HS 2	DESCRIPTION
03	Fish and crustaceans, mollusks and other aquatic invertebrates
08	Edible fruit and nuts; peel of citrus fruit or melons
13	Lac; gums, resins and other vegetable saps and extracts
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
20	Preparations of vegetables, fruits, nuts or other parts of plants
24	Tobacco and manufactured tobacco substitutes

**Table 1.36: Relative to RCEP, Two-digit HS**

HS 2	DESCRIPTION
08	Edible fruit and nuts; peel of citrus fruit or melons
13	Lac; gums, resins and other vegetable saps and extracts
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
16	Preparations of meat, of fish or crustaceans, mollusks or other aquatic invertebrates
19	Preparations of cereals, flour, starch or milk; pastrycooks' products
20	Preparations of vegetables, fruits, nuts or other parts of plants
24	Tobacco and manufactured tobacco substitutes

**Table 1.37: Relative to ASEAN, Two-digit HS**

HS 2	DESCRIPTION
08	Edible fruit and nuts; peel of citrus fruit or melons
13	Lac; gums, resins and other vegetable saps and extracts
15	Animal or vegetable fats and oils and their cleavage products; prepared edible fats; animal or vegetable waxes
16	Preparations of meat, of fish or crustaceans, mollusks or other aquatic invertebrates
20	Preparations of vegetables, fruits, nuts or other parts of plants
24	Tobacco and manufactured tobacco substitutes

Even with the implementation of the new rice law in 2019, the domestic price of rice is 90% higher than the price of rice of similar variety in Vietnam. This price gap is largely due to the market price support to *palay*/rice production. The bottom 20% of the population with poverty incidence of more than 70% has the highest ratio of food expenditure to total expenditure (more than 60%) as well as of rice expenditure to total expenditure (18%).

On the other hand, the top 20% with practically zero poverty spends three to six percent of their total expenditure on rice, and about 30% on food in general. These numbers indicate that, ironically, the poorest Filipinos are the ones shouldering the support to agri-fisheries.

The high domestic price of rice in the country has considerable impact on poverty. Using data from the FIES, in 2018, if the difference between the domestic price of rice in the country and the price in Vietnam is cut by half, the poverty incidence could have dropped to 14.8%, compared to the actual poverty incidence of 16.7% for the year, which translates to 2.1 million poor people moving up the poverty threshold. If the price difference is completely eliminated, the poverty incidence for the year could have further dropped to 13.0%, which translates to 4.1 million poor people crossing beyond the poverty line. The historical analysis and results presented in the paper indicate that if the high domestic price of rice had been corrected and addressed earlier, the poverty trajectory could have been much lower than the actual poverty situation. This could have allowed millions of poor people crossing above the poverty threshold.

Outmigration of labor from agri-fisheries to services and industry sectors is significant. This is largely due to the surplus labor in agri-fisheries, low employment productivity, and high poverty incidence. However, quality of labor in agri-fisheries is relatively low in terms of educational attainment. Thus, out-migrating agri-fisheries labor may likely end up moving to services and industry sectors where the educational attainment of labor is equally low (such as other household services, retail trade, land transportation and construction). However, these non-agri-fisheries sectors also have low employment productivity. This labor movement may have implications on urban poverty.

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## Chapter 1 Appendix: Philippine Agri-Fisheries Policies

This section provides a list of Philippine policies affecting agri-fisheries and food production. The list is arranged in reverse chronological sequence from the most recent down to the start of the World Trade Organization (WTO) in January 1996.

1. **Republic Act (RA) No. 11203 of 2019 or Rice Tariffication Law.** This is a law liberalizing the importation, exportation and trading of rice, lifting for the purpose the quantitative import restriction on rice, and for other purposes. The main objective of the law is to fulfill the Philippine international agreement with the World Trade Organization (WTO) to tariff rice with the expiration of the waiver on its special treatment on June 30, 2017.
2. **RA No. 10659 of 2015.** This is a law promoting and supporting the competitiveness of the sugarcane industry. By improving the competitiveness of the sector, the law aims to improve incomes of farmers and farm workers through productivity improvement programs. The law set zero percent value added tax (VAT) on refined sugar for exports.
3. **RA No. 10611 of 2013.** The objective of the law is to strengthen the food safety regulation.
4. **RA No. 10601 of 2012.** Food Safety Act. The objective of the law is to develop and promote agricultural machinery and equipment to the countryside in order to improve productivity, efficiency, food safety, and farm income.
5. **RA No. 10068 of 2010.** The objective of the law is to promote organic agriculture in the country. The law provides incentives to farmers engaged in organic agriculture
6. **RA No. 10000 of 2010.** The law provides an agriculture and agrarian reform credit and financing system through banking institutions. It increases the access of the rural sector to financial services and programs. It also requires banks to set aside at least 25% of their total loanable funds for agriculture and fisheries credit, of which at least 10% of the loanable funds should be for agrarian reform beneficiaries.
7. **RA No. 9729 of 2009.** The law creates the Climate Change Commission, which serves as the sole policymaking body of the government to coordinate, monitor, and evaluate programs relating to climate change.
8. **RA No. 9700 of 2009.** This is a law on the Comprehensive Agrarian Reform Program Extension with Reform Law (CARPER), which increases funds to accomplish the final acquisition and distribution of all remaining un-acquired and undistributed agricultural lands.
9. **RA No. 9367 of 2006.** This is the Biofuels law that aims to improve availability of alternative and renewable clean energy without detriment to the natural ecosystem, biodiversity, and food reserves of the country.
10. **RA No. 9296 of 2004.** This law strengthens the meat inspection system in the country.
11. **RA No. 9281 of 2004.** This law strengthens the agriculture and fisheries modernization program by extending the effectivity of tax incentives. The law mandates funding support. The law re-establishes the duty-free importation of agricultural inputs, equipment, and machinery up to 2015.
12. **RA No. 9168 of 2004.** This law focuses on plant variety protection. The law institutionalizes the system of intellectual property rights protection for plant varieties and



creates the National Plant Variety Protection Board. The law encourages research and investment in plant breeding and at the same time ensures the availability of high-yielding varieties that will increase incomes of farmers.

13. **RA No. 9147 of 2001.** This law provides protection to wildlife and resources conservation and protection.
14. **RA No. 8800 of 2000.** This is the Safeguard Measures Law that puts in place a special safeguard mechanism allowing the imposition of additional duties or quantitative restrictions whenever volumes or import prices of tariffed agricultural commodities with special (agricultural) safeguard (SSG) designation exceed their respective trigger levels as provided in the WTO Agreement on Agriculture.
15. **RA No. 8752 of 1999.** This is the Anti-Dumping Law that provides protection to domestic industries that are likely to be negatively affected by the dumping of articles imported into the country.
16. **RA No. 8751 of 1999.** This is the Countervailing Duties Law that aims to protect domestic industries from unfair trade practice of employing subsidies on a country's export products. The law also provides a better mechanism for implementing countervailing duties aligned with the commitments to the WTO.
17. **RA No. 8532 of 1998.** This law strengthens the Comprehensive Agrarian Reform Law (CARP) with additional funding resources.
18. **RA No. 8485 of 1998.** This is the Animal Welfare Law which promotes the welfare of all animals regulating the establishment and operation of all facilities utilized for breeding, maintaining, keeping, treating, or training of all animals either for trade or household purposes.
19. **RA No. 8435 of 1997.** This is the Agriculture and Fisheries Modernization Act (AFMA) that aims to modernize the agriculture and fisheries sectors by transforming these resource-based activities to a technology-based industry. The law requires the identification of Strategic Agricultural and Fisheries Development Zones (SAFDZs); the formulation of an Agriculture and Fisheries Modernization Plan (AFMP); and the provisions of funding resources support services such as irrigation, post-harvest facilities and rural infrastructure, credit, research, marketing and information, training and education, and capacity building for local government units (LGUs). The law also provides duty-free incentives for the importation of agricultural inputs, equipment, and machinery and grants duty-free imports of agricultural inputs for a period of five years.
20. **RA No. 8178 of 1996.** This is the Agricultural Tariffication Law that replaces quantitative restrictions on agricultural products, except rice, with tariffs. The law uses tariffs in place of non-tariff import restrictions to protect local producers of agricultural products from unfair trade practices, except rice, which will continue to have quantitative import restrictions. The law also provides an equitable and transparent mechanism for allocating the Minimum Access Volume (MAV) of agricultural products.



## CHAPTER 2

# Commodity Systems Approach to Planning for Philippine Agri-Fishery and Food Systems<sup>4</sup>

## Planning for Agri-Fishery and Food Systems

The series of Agriculture and Fisheries Modernization Plans (AFMPs) developed over the last 20 years had sought to achieve sector development using what might be referred to as “pathways to modernization” encapsulated as follows:

- 1. AFMP 2001-2004 – Production-enhancement pathway to sector modernization.** A combination of production, marketing, trade and fiscal interventions was envisioned to increase production of major commodities while generating rural non-farm employment. The higher-level Goals were to raise sector GVA; create one million new jobs; and protect vulnerable groups. At this time, budgetary resources were focused among others on infrastructure and Research, Development and Extension (RDE); Human Resource Development (HRD) and training for employment; and SAFDZ identification.
- 2. AFMP 2011-2017 – Value chain and climate resilient pathway to sector modernization.** This next iteration of the AFMP basically continued the original pathway but incorporated value chain analysis (VCA) and climate resilience in planning. At this time, the higher-level goals included improved food security; increased incomes; and improved resilience to climate change. This AFMP included a component plan for “transitory functions” that would enable DA to focus more on public goods and services, and corollarily allow the private sector to engage in the business of providing private goods and services.
- 3. AFMP 2018-2023 – Enhanced value chain and climate resilient pathway to sector modernization.** At the time the last AFMP was prepared, significant advances in value chain analysis (e.g., gender sensitivity) and planning for climate resilience (e.g., data and mapping) had been achieved for agri-fishery sector AFMP application. The Plan continued to seek improvements in agri-fishery productivity and production efficiency, but highlighted ecological limits and were comparable to global standards. It also reflected initial efforts to integrate spatial planning frameworks into the updated AFMP.

The National Agriculture and Fisheries Modernization and Industrialization Plan (NAFMIP) 2020-2030 will aim to leapfrog, rather than simply build on, previous AFMPs. “Leapfrog planning” is founded on the realization that “agri-fishery modernization”—as called for under the Agriculture and Fisheries Modernization Act (AFMA) of 1997—cannot be achieved using business-as-usual planning approaches. Rather, sector modernization will require no less than transformative planning that employs innovative sector development strategies, rather than incremental planning that only builds on previous sector planning strategies. Here, the “Agri-Industrialization Pathway to Sector Modernization” is introduced.

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<sup>4</sup> Prepared by Cesar B. Umali, Jr., Team Leader and Development Planning Specialist, ADB TA 9681 REG; Eufemio T. Rasco, Jr., PhD, Agricultural Crops, Livestock, and Poultry Expert, SEARCA; and Cleto N. Nañola, Jr., PhD, Fisheries Expert, SEARCA

The previous AFMP 2011-2017 and 2018-2023 were both anchored, as appropriate, to the higher-level Philippine Development Plan (PDP) for the respective plan periods. The AFMP 2018-2023 adopted the PDP 2017-2022 Societal Goal: “To lay down the foundation for inclusive growth, a high-trust and resilient society, and a globally-competitive knowledge economy” to which the agri-fishery sector will contribute. Said AFMP adopted as agri-fishery sector goals the two PDP 2017-2022 sector outcomes: (1) “economic opportunities in AFF expanded”; and (2) “access to economic opportunities by small farmers and fishers increased.”

As the PDP continues to serve as context for the NAFMIP, the NAFMIP Preparation Team (NPT) will orient more strongly the agri-fishery sector plan outcome statements and indicators toward **transformative agri-industrialization as main development strategy**—anchored on the recommended re-statement of the sector vision as: “A Food and Nutrition Secure Philippines with Prosperous Farmers and Fisherfolk” (boldface supplied). While Food Security refers to Filipinos having stable access to sufficient, affordable and safe food in sufficient quantities, Nutrition Security highlights a desired complementary shift in consumer demand (behavior) away from unhealthy, mass produced commodities such as white sugar, white rice, and white bread that are linked to chronic diseases like heart failure, stroke, diabetes, and cancer (Rasco, 2021).

All NAFMIP performance indicators will be geared toward sector transformation. For instance, instead of saying “employment increased,” NAFMIP will be assessed in terms of “sustained employment generated by agri-industries” in line with the transformative agri-industrialization strategy. In addition and perhaps more significantly, NAFMIP will incorporate nutrition-sensitive agri-fisheries indicators, such as “increased per capita production/supply of planetary health diet (PHD) commodities.”<sup>5</sup> It is important that indicators are time-bound to set realizable targets (e.g., number of agri-industries established or expanded; or percent of consumers shifting to PHD) over the five-year plan period.

**The Plan Results Framework/Logical Framework (Log Frame) will continue to serve as major planning tool for NAFMIP preparation.** The plan framework will guide plan preparation and enable the multifarious interventions from all DA Operating Units (OUs), other NGAs and even LGUs to coalesce toward achieving the twin objectives of raising productivity and incomes. It is important to continually remind everyone including planners regarding the integrative role of the plan framework. It is noted that the sector assessment carried out in connection with the previous AFMP 2018-2023 cited that “... the challenge in preparing a complex plan is on how to integrate the strategies, directions, and interventions of various programs and projects of different agencies and institutions, which are all directed toward a common clientele, the farmers and fisher folks....” The plan framework will address this challenge (OIDCI, 2018).

**Our rapid assessment of agri-fishery sector plans also indicates opportunities for strengthening spatial planning, consistent with the DA’s Agri-Industrial Growth Corridor (AIGC) Approach.** AIGC will involve identification of a network of agri-industry hubs within which: (1) major investments in high value chain segments by “responsible business” will be concentrated; (2) organized clusters of farmers and fishers will be linked to agri-industries to promote broad-based growth; and (3) coordinated DA, LGU and other NGA services will be directed. The agri-industry hubs already identified by DA will be supplemented by hubs to be identified in upcoming NAFMIP regional planning workshops to generate

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<sup>5</sup> The planetary health diet advocates minimal processing, greater proportion of plant-based food, and diversity in the plates. The elegance of this approach is that it will help solve not only health and nutrition problems of consumers. Because of increased demand for a more diverse food, it will also increase the income of farmers, as diversified farms are more productive than monoculture. It will also address environmental issues because diversified farms help sustain the integrity of the environment better than monoculture (Rasco, 2021).

regional/spatial plans, meaning commodity system and functional/service delivery plans with a spatial dimension. The succeeding national planning workshop series will generate commodity system and functional plans supporting and complementing said regional plans. The national planning workshops will not produce separate spatial plans.

Related ideas to enhance the agri-fisheries sector plan are organized in Table 2.1.

**Table 2.1: Comparison of Agri-fisheries Planning Substance and Mechanics**

COMPARATORS	PREVIOUS AFMPS	NAFMIP 2020-2030
1. Scope	Covering numerous challenges all at once (“exhaustive and exhausting planning”)  Plan results framework appears complicated and lengthy.	Focusing on prioritized challenges to sector modernization and its major elements <sup>6</sup>  Results framework simplified and tighter in terms of causal relationships
2. Objectives	Many parallel objectives which could possibly conflict, e.g., food sufficiency vs. poverty alleviation	Diversification supported by agri-fishery industrialization serving as main strategy (pathway) to raise productivity and income ( <i>ani</i> and <i>kita</i> )
3. Themes	Food security, agribusiness and climate resilience pervading the sector plan	Food security + nutrition security + environmental health and management of multiple risks; addition of consumers’ health
4. Resource/budget allocation	Substantially earmarked to food security; major funding responsibility lodged with DA	Significant DA, LGU, and other agency allocations for catalytic agri-industrial investments (sector-wide budgeting)
5. Value chains	Equal focus on numerous commodities and all value chain segments at the national, regional and local levels	Prioritized commodities, services, and product value chains using quality-based competition framework; both domestic and global chains
6. Planning process	Parallel commodity, functional, and regional planning (“incremental planning” based on previous plans)	Regional spatial planning (including SAFDZs) anchored on Agri-Industrial Growth Corridors; stronger private and multisector participation

<sup>6</sup>The elements of sector modernization include government-supported agri-industrialization; responsible business-led, use of advanced technologies (hybrid/ super varieties, mechanization, modern equipment and facilities, water systems); income and commodity diversification; value adding and high-value commodities; priority value chain development (vertical and horizontal integration of commodity systems); eliminated threats to food security; and efficient organizations in three stakeholder groups: (1) farm and farmers and fisheries consolidation/ clustering, (2) clustered government support, and (3) efficient and inclusive business models.

COMPARATORS	PREVIOUS AFMPS	NAFMIP 2020-2030
7. Commodity planning	By individual commodity	Using prioritized and inter-linked commodity systems (farm-/ fishery-based approach)
8. Production systems	Fragmented farms; interventions directed largely to individual farmers and fishers	Farm and fishery consolidation/ clustering and organizing to raise services delivery efficiency and competitiveness; diverse forms of consolidation are explored (not limited to land consolidation)
9. Performance indicators	Mainly production and productivity-oriented such as GVA and production value; growth in labor productivity; and reduced post-harvest losses	To add metrics of modernization, such as large private investments in agri-industries, horsepower per hectare, income and commodity diversification index, share of farmers in the consumer peso, value-added ratio; shifts in production and consumption to seven indicator commodities (whole cereal grains, grain legumes, fruits and nuts, vegetables, fish, root and tuber crops, milk and dairy, coconut oil)
10. Government role and support to plan implementation	Fragmented by government agency; annual agency budgets not necessarily based on AFMP as multi-year sector framework plan	Orchestrated and decentralized, involving DA, DAR, DENR, NEDA, DTI, DOST, PCARRD, LGUs, private sector, etc.
11. Planning mechanics and tools	Matrix-based planning; DA Regional Offices (RO) required to prepare narrative plans	ICT-supported matrix-based planning plus long-term HRD planning (upscaled ESETS)

### The Key to Agri-Fisheries Transformation—More Diverse Food on the Table

The key element in the transformed food system envisioned by NAFMIP is more diverse food on the table—a departure from the trend of the last 100 years since the food system industrialized. The trend up until now is toward decreasing diversity of food in favor of a few species that are suitable for mass production and distribution. Among these are grain crops (e.g., rice, wheat, corn, and soybeans), sugar, chicken, pigs, beef, eggs, milk, and a few species of seafood. In Metro Manila, it is graphically illustrated by the shift from *carinderia* (traditional restaurant) in our childhood with its parade of native dishes displayed on counter tops in shiny stainless-steel pots, to the ubiquitous glass and steel air-conditioned fast food restaurants with standard menu featuring mostly variations of hamburger sandwiches or rice and chicken or *bangus* plus sugary drink. The *carinderia* culture is fast disappearing as fast food conquers the restaurant territory.

Filipino food used to be diverse but this food diversity has, over the years, progressively declined along with the native ingredients that it created. Many of the traditional food ingredients only remain in neglected botanical collections, in the minds of old chefs and faded

recipe books, and in folk songs. The meaning of food in the Philippines has narrowed down to only one kind: rice, a grain introduced to the Philippines a few thousand years ago from Southern China and evolved with human care in the variety of ecosystems in the archipelago. When Filipinos talk about food security, they mean rice security.

### ***Current Focus on Rice***

As late as 50 years ago, we had hundreds of different types of rice varying in grain color, shape, eating quality, size, plant type, maturity, and uses. Today, only one kind dominates our dining table: white, medium-grain length grain, from a plant that is short-statured and matures in four months or less. White rice, as we know it today, is a product of modern plant breeding brought to our table by an industrial system that removed most of its nutrients and left a grain that is almost 100% starch. The great majority of the thousands of traditional varieties are only found in some long-term cold storage in a couple of fund-starved facilities.

Filipinos do not consider themselves to have eaten if they have not eaten white rice. In very poor households in the city, the only food they can afford is white rice. They would rather spend on expensive white rice and eat a nutritionally inferior side dish than go for cheaper rice with a nutritious side dish. Indeed, the very poor may eat nothing but white rice and salt on certain days. While newly developed Asian countries show a declining trend in rice consumption, the increasing trend continues in the Philippines.

### ***Synchronizing Change in Food Consumption Patterns with Farm Diversification***

Because white rice is so cheap, so convenient, and so deeply entrenched in Philippine food culture, it is almost unthinkable that Filipinos can be weaned from white rice. No politician today can survive public opinion telling people to eat less rice. Yet any attempt to change our food habits to correct a dysfunctional food system cannot avoid targeting rice, specifically white rice, for the simple reason that it is the major cause.

Further, excessive white rice consumption is linked to unfavorable health outcomes and is burdensome to the government, farmers, and the environment. The NAFMIP calls for a change in food culture focused on reducing white rice consumption and production. But the first move must come from the consumers. They must not only reduce rice consumption but also increase consumption of other foodstuffs. What items and quantity of each? The answer is locally adapted crops, livestock, and fish, informed by the planetary health diet.

The **envisioned food system considers consumption as the key to transforming the entire system. Consumption is tightly connected with** the other components to indicate that the system should ideally be a fully integrated system. Consuming need not be disconnected from the **producing, marketing, and waste management** if the consumers do all the three steps themselves in their own household. This type of multifunctional prosumer rings true to many quarantined households in Metro Manila during the COVID-19 crisis. The system can be so tightly connected that one component can easily blend with the others. While the consumer can also be the producer, the producer can also be the trader. All of them can be waste managers. In this tight system, overall efficiency is maximized. It is the ultimate food system goal, which can be made possible by technology. In the next 10 to 30 years, a transition plan is needed.



## Diversification in the Rice Farm

The rice fields of Central Luzon are the main source of rice for Metro Manila. During the dry season, about a third of these areas are devoid of vegetation due to lack of irrigation systems.

Rice is a water-hungry food crop, requiring 2,500 liters on the average; but more than 5,000 liters in extreme cases to produce a kilogram of rough grain. Among the major food crops, it has the highest water requirement. It uses up as much as 88% of the country's diverted water from watersheds to the east of Metro Manila.

In the Philippines the large rice farm areas are owned by millions of farmers, where the average farm (about one hectare) is barely sufficient to support the basic needs of a farm family. What keep the rice farmers going are endless subsidies from the government, such as free irrigation, free inputs (e.g., seeds and fertilizers), and credit with minimal interest. In the ultimate analysis, these subsidies benefit everyone in the food system, except the farmer who remains poor. These are financed by regular budget allocations and tariffs from rice imports.

Policy makers envision a rice farmer to be happy and globally competitive, producing 10 tons of rice and selling it at a margin of approximately PHP7 per kg. This is a pipe dream without subsidy because the average yield of rice today is only about four metric tons per hectare. Farmer profit dives to almost zero when traders manipulate the market and buy at only a little above production cost.

Assuming that average landholding remains one hectare, the average cropping intensity is increased to two (the same field is used for growing rice twice a year) by the massive expenditure on irrigation, and the traders' profit is moderated. The government's dream will only give the average farmer PHP140,000 per year, barely above the poverty line, which is PHP120,000. This profit will be reduced in the next generation when the farm is divided among many children. Obviously, using the best assumptions, continuing to grow rice may be good for the traders and other players in the value chain but it will not make the rice farmer happy.

## Diversifying Production to High-Value Staples

**Diversification to high-value alternative staples is one obvious strategy.** The challenge with this solution is that the strong candidates as alternative staples to be grown in the rice environment (*camote* and corn) have acceptability issues. Corn as a staple is used only in a few provinces and national figures show a declining trend in consumption. *Camote* presents a bigger challenge; it is only eaten as a snack food and not as a staple. In addition, *camote* is more perishable and suffers from huge postharvest losses. Both corn and *camote* suffer from the stigma of being a poor man's food. Obviously, these crops need a good press more than they need better agronomists.

To make corn more acceptable, an on-going project by the University of the Philippines Los Baños uses rice-corn blends. Blending with white rice is not new to the Filipino taste; it has been done not only with corn but also with root and tuber crops as well as cooking type banana. Another approach is food processing to improve acceptability. *Camote* can be processed into noodles—a food item that is not a staple but more appealing to the local taste—and consumed on a regular basis at home and in restaurants. Sweet potato noodles are well accepted as a premium noodle in many Asian countries.

The idea is to target the middle class for demand creation. They are better educated and have higher disposable income for food. They, along with younger generations, are open to experiment with food choices if they understand the health impacts of excessive white rice

consumption. They also support contemporary values about the environment, food culture, and farmer welfare.

Reducing rice consumption by partly switching to alternative and complementary staples is not sufficient to satisfy the requirements of the traditional Filipino diet informed by PHD. Based on prevailing consumption patterns, this diet calls for drastic increases in consumption of grain legumes, vegetables, fish, root and tuber crops, milk, and coconut oil. In addition, it calls for a shift to consumption of whole grains instead of white bread and white rice. These foodstuffs can easily be incorporated into the Filipino diet, but consumption is low mainly because of price and availability issues. Improved production and marketing technology can address these issues. Many of these crops are adapted to farming systems with rice.

Farm diversification is highly doable in the rice farm as it has subsidized irrigation; highly skilled farmers serviced by a good research and extension network; the greatest number of farmers and workers compared to other farming activities; and it is served by the best farm road network in the country. Increased income on the rice farms will give the highest socio-economic impact.

Diversification can initially target rice lands that are marginally suited to rice and those where the average farm size is less than one hectare. Farmers in these areas are the poorest rice farmers. Instead of growing rice throughout the year, the farmer may choose to grow rice during the wet season, and switch to dryland crops during the rest of the year. In this manner, the limited amount of irrigation water can be spread over a wider area. **Among the possible rice crop alternatives are corn, mungbean, camote, and vegetables, which are more profitable than rice** and will be required in large quantities given a switch to PHD. For example, *Camote* and onion can easily give the farmer twice the profit from rice at conservative prices. Onion, unlike *camote*, has a stable demand but local supply is always short. In 2018, the country imported PHP1.2 billion worth of onions.

### Options for Commodity System-based Agricultural Transformation

The agricultural landscape in the Philippines is dominated by rice, corn and coconut. The farms are typically small (about 1 ha for rice) and practice monoculture. The low profitability of these crops coupled with the small farm size is the main reason why farmers remain poor. Livestock and poultry growers suffer the same fate. On the other hand, capture fishery is dominated by fishers who cannot venture further out into richer fishing grounds because of lack of technology. Their fishing grounds are also depleted. Aquaculturists typically operate small fish cages or fish pens that specialize on two major species (*bangus* and tilapia). The fishers compete with coconut farmers in the distinction of being the poorest sector in the Philippine food system.

As a main strategy for improving the income of farmers and fishers, we are proposing diversification of products as well as in farm- and farm-related activities. Diversification in the manner we envision will require a commodity systems-based approach. The NAFMIP Planning Team strongly endorses moving from commodity-centered planning to commodity or food systems planning.

What is commodity system-based planning? It is:

1. Coordinated (if not integrated) planning for two or more Inter-linked crops, livestock, poultry and/ or fishery commodities, e.g., rice and fish;
2. Rooted in the farming systems approach;
3. A planning approach that operationalizes the OneDA diversification strategy, leading to a food and nutrition-secure philippines with prosperous farmers and fishers; and

4. Recommending five commodity systems: rice-based, corn-based, coconut-based, fishery-based, and geographically specialized commodity systems (GSCS).
5. All other commodities (livestock and poultry, high value crops, organic, halal, etc.) can be part of one or more of the above five commodity systems.
6. Commodities may be “inter-linked” in various ways: (a) intercropping; (b) rotation cropping; (c) multi-cropping; (d) integrated multi-trophic aquaculture (IMTA); (e) polyculture; or (f) recycling of production or processing waste as input to production or processing of another commodity.

The advantages of commodity system planning compared to single commodity planning are shown in Table 2.2.

**Table 2.2: Commodity System-based vs. Single Commodity Approach to Planning**

CRITERION	SINGLE COMMODITY	COMMODITY SYSTEM
1. Productivity measurement	Based on one commodity	Based on total farm productivity
2. Investments	Specialized on one commodity	Shared among commodities
3. Knowledge and skills requirement	Simple	Complex
4. Risk from all sources	High	Low
5. Relative farm income	Low	High
6. Relative efficiency in using resources (labor, land, water, fertilizer, machines)	Low	High
7. Planning approach	By commodity	Systems approach; by “anchor commodity” together with linked commodities
8. Planning perspective	Industry development	Farm/fishing household and industry development
9. Institutional/organizational arrangements in planning and implementation	Commodity program directories	Commodity system program directories
10. Scope of value chain analysis (VCA)	All segments, players and their relations in one commodities	Segments of two or more commodities linked in one unified systems

### ***Rice-Based Commodity Systems***

Among the many proven farm diversification systems are rice-fish (a practice that is 2,000 years old), rice-duck, rice-vegetables, and more diverse systems such as using rice straw as substrate for growing mushrooms, and spent mushroom substrate for feeding ruminants. The ruminants can produce milk, and the manure can be used in vermiculture to produce fertilizer for rice, completing the circular system. These examples of diversification provide opportunities for vertical and horizontal integration with enhanced income, security against

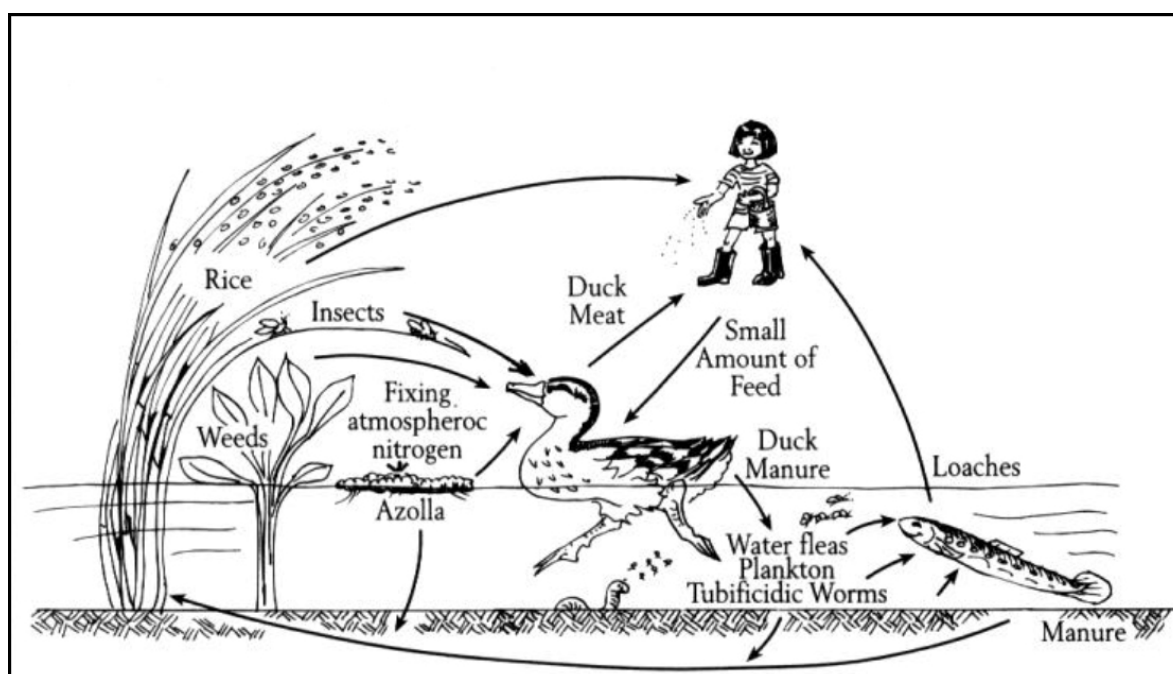


losses, and better environmental outcomes. It creates year-round employment opportunities even for the urban poor and particularly for women who have been displaced by the mechanization of rice farming. In contrast, labor use in monoculture rice farming is seasonal.

To encourage diversification, various models of diversification are on year-round display at the Future Rice Farm and *Palayamanan* (diversified rice farm) sites of the Philippine Rice Research Institute (PhilRice). These serve as a laboratory for studying diversification options and implementing 4IR technologies, an educational farm tourism destination, and a marketplace for fresh and minimally processed products.

Figure 2.1 presents an idealized agriculture system featuring two food species (rice and duck), with azolla serving as feed for duck and fertilizer to the rice plant, insects serving as feed for ducks, duck manure serving as fertilizer to rice. A modified version will include fish, mushrooms for utilization of rice straw, carabao to provide manure for earthworms, and vermiculture to produce fertilizer for the rice plant. A similar system can be conceived for sustainable aquaculture.

**Figure 2.1: Example of an Idealized Rice-based System**



Diversified rice farms will likely supply food crops other than rice mostly during the dry season, as the environment may not be too favorable for dryland crops during the wet season. However, technologies also exist for growing dryland crops in rice paddies, such as farming in sorjan beds (raised beds in paddy field).

Improved technology also promises to reduce the negative environmental impact of rice monoculture, thus rice farming need not be so environmentally damaging. These technologies will further reduce costs and make the rice farmer more competitive in the global market.

Reducing the negative health impacts of white rice has likewise received due attention from PhilRice. Among the approaches is the use of varieties with better nutritional value. Government support in the form of more favorable policies on biotechnology and research and development (R&D) funding are much needed to bring these products to the consumer table.

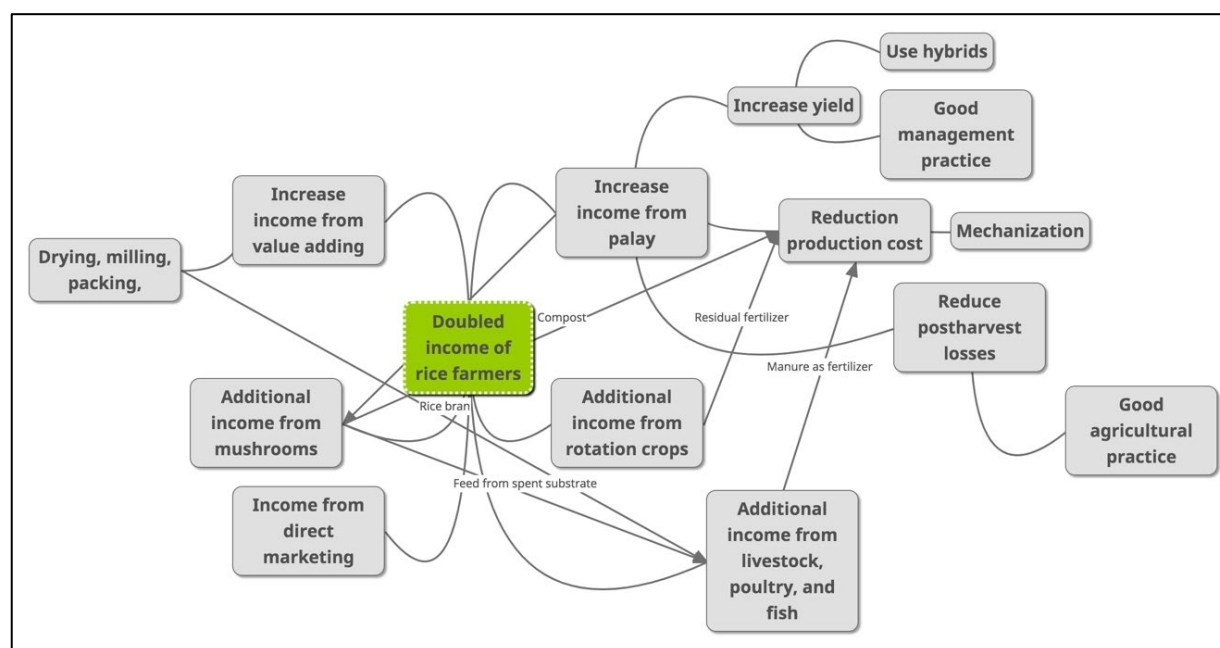
Diversified rice farms can become a main source of plant-based food commodities by 2030. They will continue to produce rice but should increasingly produce other commodity foods and even high-value crops that are in demand, particularly those with good handling and storage qualities.

Some monocrop rice farmers in the best areas and those with bigger-sized farms will remain as the main suppliers of rice in the country. To be globally competitive, these farms need to consolidate to make mechanization possible, thereby reducing labor cost and improving production efficiency.

With the above expected adjustments, rice production systems will tend to branch out into the following categories: (1) diversified, integrated, and intensified; (2) high-tech (monoculture); and (3) conventional (monoculture). The first two will be more compliant with environmental care, while high tech will be more dependent on 4IR technologies as well.

Figure 2.2 presents our analysis of rice-based system pathways to bring the farmer out of poverty. It illustrates the different possibilities for increasing the income of rice farmers. The choices will have to be made at the local level, building on existing practices. For example, rice-mungbean integration may be the choice in areas in Isabela that have similar conditions to San Mateo, where it is an established practice. In Laguna, rice-duck integration is a good possibility in areas around Pila, where it is an established practice.

**Figure 2.2: Solution Pathways for Rice-based Systems**

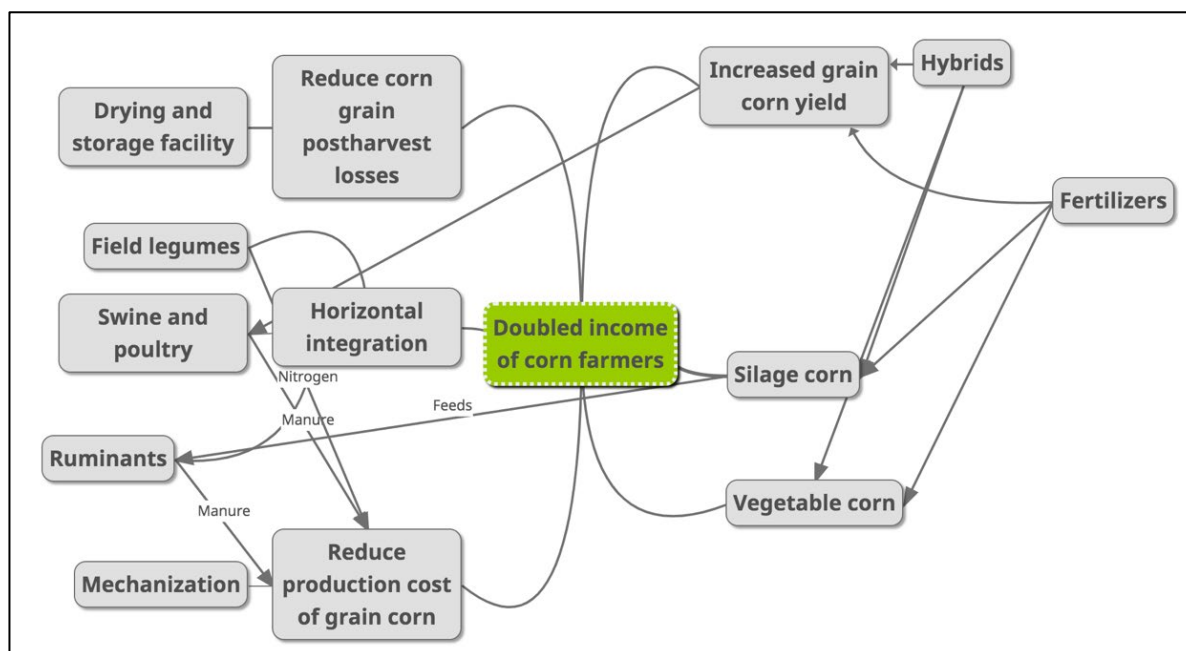


### **Corn-based Commodity Systems**

Figure 2.3 illustrates pathways out of poverty for corn-based system farmers. As corn is known to deplete the soil of its nutrients, UPLB had studied way back in the 70s and 80s corn-legume intercropping schemes, the legumes being known to help augment soil nitrogen through nitrogen fixing actions by their roots' interaction with rhizobia bacteria. Legumes comprise the recommended protein source in the traditional Filipino-cum-planetary health diet. As source of animal feed aside from human food, combining animal raising with corn farming along with other high value crops is one pathway out of rural poverty.

Local planners need to decide which of the possibilities in Figure 2.3 will be assigned to each of the phases of development identified by DA: recovery, growth, and resilience. In provinces with high urban population, shifting to vegetable corn may be a path to recovery. This will not require a lot of training and the lucrative market is within easy reach. In areas that exhibit high postharvest losses of grain corn, putting up drying and storage facilities may be the option.

**Figure 2.3: Solution Pathways for Corn-based Systems**



### Coconut-based Commodity Systems

For coconut, research as well as practice has shown the merits of various intercropping combinations under coconut with livestock growing. Figure 2.4 shows solution pathways out of poverty with coconut-based farming systems. Added income may come from engaging in value-adding processes toward manufacturing various coconut-based products (left side of Figure 2.4), and coffee, corn, abaca, and other perennials grown under coconut. Replanting of new trees to replace the aging ones in decades-old coconut farms is necessary.

Local planners may decide to prioritize value adding in areas where there are willing investors who can partner with farmers in putting up processing facilities. Where there are no investors and the areas are close to the market and relatively young coconut trees, short season vegetable crops may be an option for intercropping.

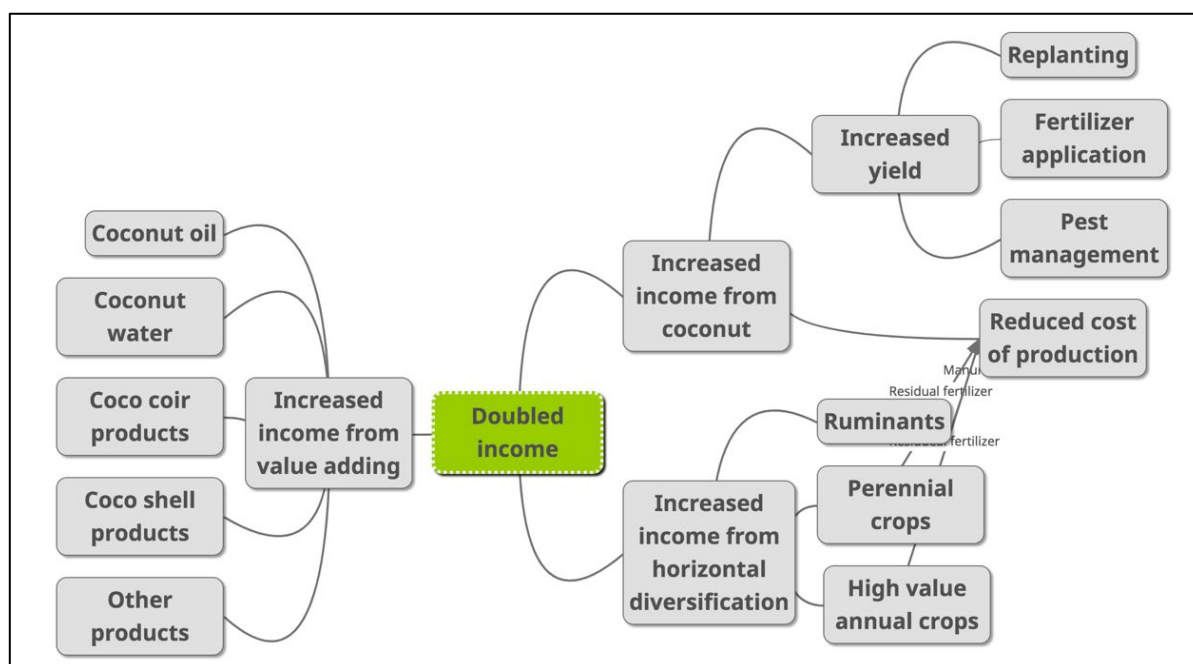
### The Future of Fish

The Philippines is severely handicapped by limitations of land and water in terrestrial farming, but not as much with harvesting food from the sea. The archipelago has seven times as much water as land and it has access to rich fishing grounds. If this resource is nurtured, it can continue to yield fish to 2030 and beyond. The yield from capture fisheries will be supplemented by aquaculture.

Rice and fish comprise the basic Filipino food. Fish consumption makes sense because of the archipelagic nature and rich fisheries of the country. In Metro Manila specifically, three nearby large bodies of water supply most of the fish.

Aquaculture in the scale seen near Metro Manila is a relatively young industry, but not necessarily so with respect to cities in other regions. Negros Province had a boom in shrimp aquaculture in the mid-1980s when its wealthy families converted their sugar plantations into shrimp farm to cash in on their high export demand until disease problems caused their decline after 1992 (FAO, 2005-2021). Capture fishery used to be the main source of fish for Metro Manila. Indeed, Manila Bay once supported the second largest fishery in the country. But overfishing, deterioration of water quality, habitat degradation, and rapid urbanization pushed down its fish yield to less than 10% of the level in the 1940s. The rivers flowing through Metro Manila suffered this fate sooner; they are no longer identified as an important source of commercial fish.

**Figure 2.4: Solution Pathways for Coconut-based Farming Systems**



Altogether, the fish industry in the Philippines is second only to rice in number of jobs created. About 1.9 million fishers engage in fishing activities throughout the country, broken down into different sectors: capture fishing, aquaculture, fish vending, gleaning, fish processing, and others. While there are four times as many fishers involved in capture fishing as there are fishers involved in aquaculture, the latter accounted for more than 50% of fish tonnage reported in 2018 for the entire country. Poverty incidence in the fishing industry is high at 34%, and artisan fishers are considered the poorest of the poor in Philippine society.

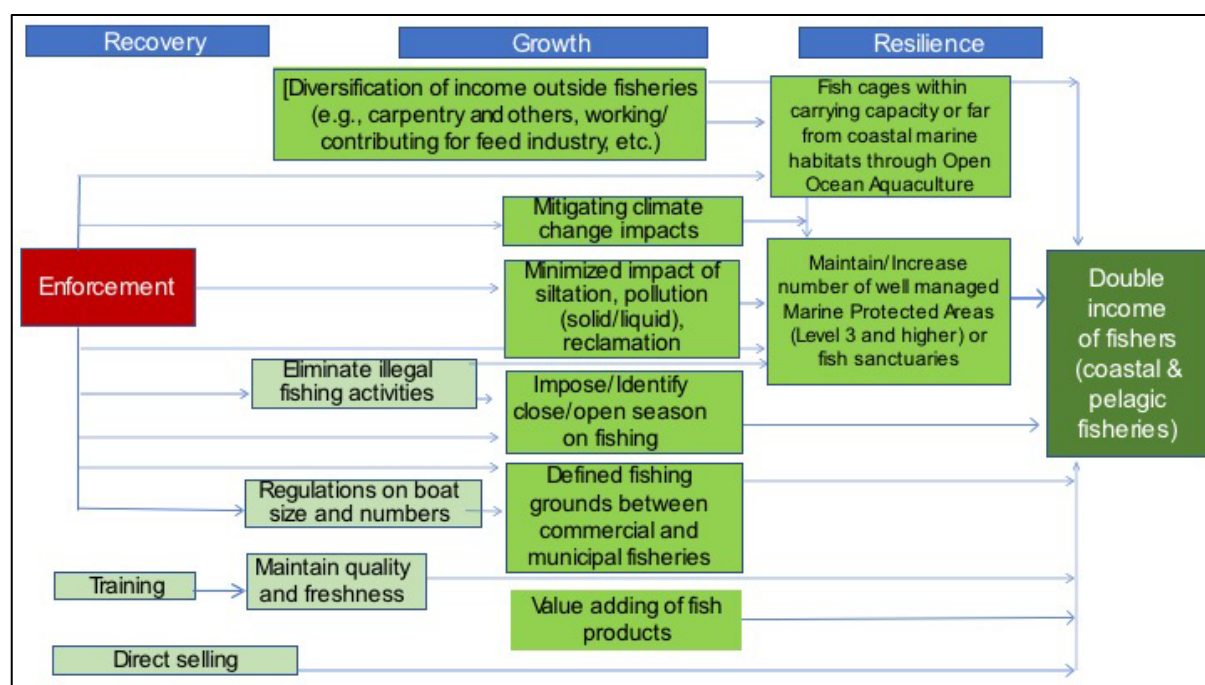
Figure 2.5 shows our analysis of solution pathways for capture fisheries. In this diagram, doubling the fishers' income is in the context of the fisher's family unit. To meet the target, e.g., double the income of fishers (shaded as dark green), the activities are categorized into three, namely: recovery, growth, and resilience (colored blue), which all address the sustainability of marine resources (e.g., blue economy). The other shades of green boxes from light to medium represent the outputs and outcomes, respectively. Furthermore, it emphasizes that to achieve the impact, enforcement is the most critical input. Presently, the country has more than enough laws leading to sustainability of the marine resources but these have not been fully enforced particularly those pertaining to illegal, unreported and unregulated (IUU) fishing activities.

Assuming everything is in place, the more obvious ways of achieving this is through direct selling of their daily catch while fresh; and by value adding through food processing.

Although aquaculture thru fish cages in tandem with mariculture such as seaweed and oyster farming are the best combinations as other sources of income, it has to be well managed and enforced within the areas' allowable carrying capacity. Neglecting such policies will not only result in fish kills but it can result in irreversible damage to marine habitats particularly the coral reefs.

To maintain the natural source of fish supply, which is the main target commodity of our marginalized fishermen, there must be some portions of the marine habitats that have to be protected or conserved. Hence, existing fisheries laws must be well enforced including minimizing impacts of siltation/pollutants and other wastes drained thru river systems. These things are critical in mitigating climate change impacts.

**Figure 2.5: Solution Pathways in Capture Fisheries**



Presently, there are close to 2,000 marine protected areas (MPAs) all over the country. It started with two MPAs in the mid-1970s and gained national support among fishers and coastal communities in the late 1990s. In 2007, the first national award was given for the best managed MPA in the country. Since then, the activity has been held biennially.

For the inland fishery sector (Figure 2.6), almost the same steps are involved. But for fishers that are more inland situated, the critical need is training on skills to increase their income. This is similar to the other commodity systems mentioned above.

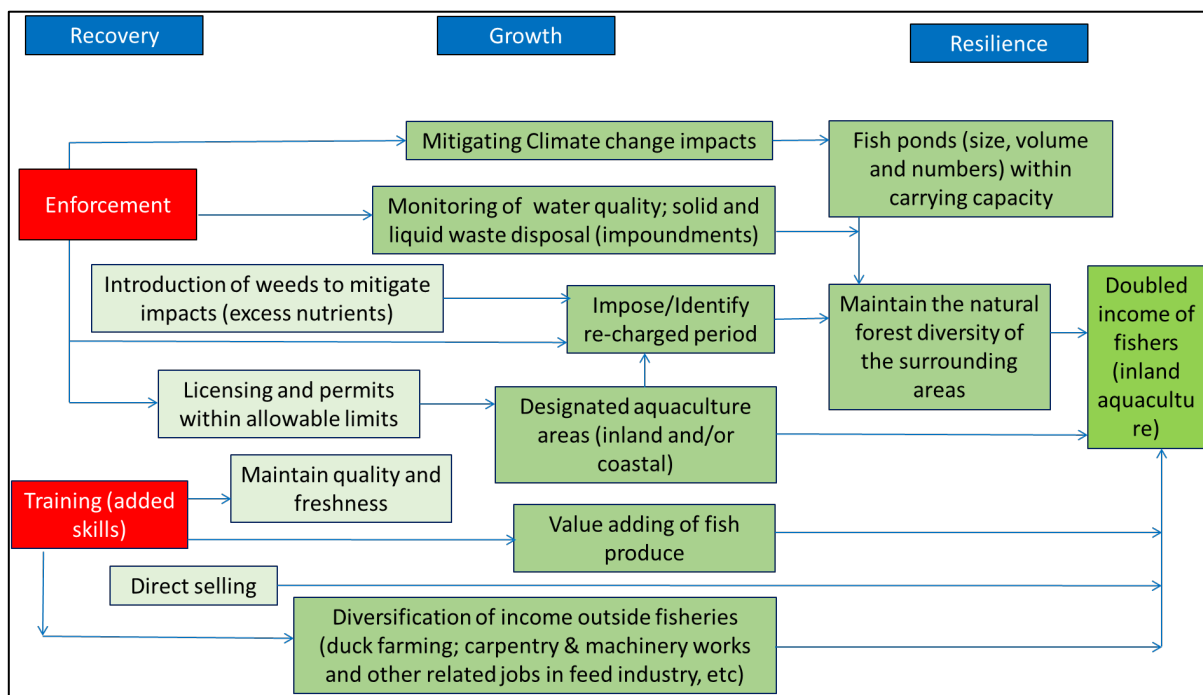
Alternatively, during lean months, fishers' incomes can be augmented through diversification. Thus, the local government unit needs to collaborate with the other sectors of the government, such as DTI and DPWH, including the private sector.

By 2030, we can aim for more than 50% of the fish supply in the big cities to come from aquaculture. Today, all of the aquaculture around Metro Manila is essentially monoculture dominated by only two species (*bangus* and *tilapia*). Monoculture fish is a large-scale



commercial operation. In Laguna de Bay, big-time capitalists crowd out small fish pen owners and the lake itself, leaving little room for small operators and for navigation within the lake. The Laguna Lake Development Authority (LLDA) had to reserve areas for these purposes and for native fish reproduction as well. The other major issue is water pollution from domestic, agricultural, and industrial waste discharged into the lake by communities and farms and factories around the lake.

**Figure 2.6: Solution Pathways in Inland Fisheries**



### Diversification in Aquaculture

In the same way we envision diversification in the industrial type of rice farming, we envision diversification in aquaculture. However, the technology for diversification in aquaculture is not as nearly mature as diversification in rice. After all, our skill in fish culture in captivity is fairly recent compared to that in plant agriculture. Two models—aquaponics, which is growing fish and crops together in a controlled environment, and integrated multitrophic aquaculture (IMTA)—are worth looking into. Both of these can significantly reduce the pollution of monoculture fish farming and increase fish productivity.

Both models require substantial investment. Hobbyists can show the way like in artisan farming. As we pointed out earlier, hobbyists have the money, are willing to experiment and take risks, highly educated, and values-motivated. They can inspire and train traditional fishers. Sustaining current efforts to clean up Manila Bay and the two lakes can accelerate diversification. Government-supported R&D, incentives to the private sector, and subsidy for small aquaculturists will also help.

A highly successful aquaculture model involving artisan fishers-turned-aquaculturists is demonstrated in the Panabo Mariculture Park in Davao Gulf. It is patterned after industrial parks where planned infrastructure and government services are provided and locators converge. In Panabo, the business unit (10- x 10-meter cages) is small enough for the small-scale aquaculturist. This small unit can generate a profit of PHP85,000 or PHP340,000 per hectare of water given that only four fish cages allow for navigation and control pollution; for the same length of time (120 days) and the same amount of space, a rice farmer would earn

only PHP70,000 in the best-case scenario. If aquaculturists diversify into high-value fish, their profits will go further up.

If fish can command the same public attention as rice, subsidies and favorable policies for the fish sector may come more easily. The ones who need this support the most are the artisan fishers, comprising close to a million in the entire country. Their fishing grounds need protection from poachers, illegal fishers, and polluters. Their fish need sanctuaries. They need better equipment. Sometimes, they need to be protected from their own destructive fishing ways. And they can also be encouraged to do aquaculture.

## Geographically Specialized Commodity Systems

Rice-, corn-, coconut-, and fish-based commodity systems cover a great majority of the rural poor, hence NAFMIP gives them priority over other commodity systems that we collectively refer to as Geographically Specialized Commodity Systems (GSCS) in the sense that they are not as widespread and anchored on an established monocrop as the first four systems. Examples of these are the artisan farm and urban farm as described below.

### ***The Artisan Farm***

The artisan farm has many alternate names depending on the main objective and production method. They are usually located in peri-urban upland and hilly areas. All of them tend to be multifunctional lately. A new trend is the farm that starts as a hobby, then evolves to become a tourism farm with the added function of training. The hobby farm's main revenue eventually comes from selling farm products rather than tourism and training services.

Organic farms, a type of commercial artisan farm restricted by their production method, are gaining practitioners. At the moment, however, organic agricultural products are expensive and cater only to a niche market.

The conventional commercially oriented artisan farm supplies the bulk of high-value food crops today and it is likely to continue to do so. It is typically small, less than five hectares, but its main feature is diversity and labor intensity, requiring a high level of skill. But the artisan farm may also involve a wide range of crops, and may also include livestock, poultry, and fish. A few farms are conservation-oriented—they grow native species such as wild pig and chicken and heirloom crop varieties (e.g., black rice).

At the other extreme are capital-intensive, specialized high-tech farms with modern features such as net and plastic houses, drip irrigation, and non-native crops such as salad vegetables to provide year-round supply to the high-end market. Some artisan farmers also venture into food processing.

With such a variety of options, the artisan farms can not only cater to a range of food preferences, but also provide food diversity needed in the PHD, increased farm employment, and revival of local food cultures.

The typical modern artisan farm is initiated by an educated entrepreneur, including the newly retired baby boomer, who is keen on farming as a lifestyle to support good health and mindful of environmental impact. She is the opposite of the traditional artisan farmer who had dropped out of school due to poverty, earns barely enough, is afraid to take risks, is shunned by banks, is at the mercy of traders, does not inspire her own children to inherit her work, and continually looks to the government for support.

The modern artisan farmer is a keen experimenter, constantly trying new products, processes, and markets. She will serve as a trailblazer and an inspiration to other similarly placed

entrepreneurs, as well as traditional farmers. Successful models exist, where traditional farmers are assisted by the more advanced ones by providing them technical assistance as well as linking them to the market. Indeed, many modern artisan farms also serve as government-accredited training centers.

The poster case of a modern artisan farm is the Costales Nature Farm in Majayjay, Laguna, although many similar ventures have sprung up and are modeled in various parts of the country as well. They usually start as a hobby by a retired professional or overseas Filipino worker, become a commercial organic farm, then finally a tourist destination. Costales Nature Farm has the distinction of being the first government-accredited tourism farm that has inspired many others. In 2019, the list of tourism farms and learning sites had expanded to 31 and 51 members, respectively, just in the five provinces bordering Metro Manila.

Region IV or CALABARZON has the biggest concentration of artisan farms in the country. When they flourish with increased demand for diverse food products, they will absorb labor that otherwise will migrate to and fill the slums of Metro Manila. They will attract new investors, inspire new business models, and energize the countryside with their idealism, knowledge, and money.

A fitting illustration of a new investor is the case of Mr. Crisanto Gualberto, a highly educated experienced farmer who plans to put up a network of small coconut-based farmers around a food innovation hub producing nutritious processed coconuts that the farmers would co-own. It will be a good model for combining the social orientation of artisan farming with the economic orientation of industrial farming. These new investors will be encouraged by new consumer habits, and will likely attract aquaculturists as well. Aquaculture is uncharted territory, with greater potential for food security and poverty alleviation in the Philippines than terrestrial farming.

The pathways for doubling the income of high and mid-elevation vegetable growers, an example of the artisan farm, is shown in Figure 2.7.

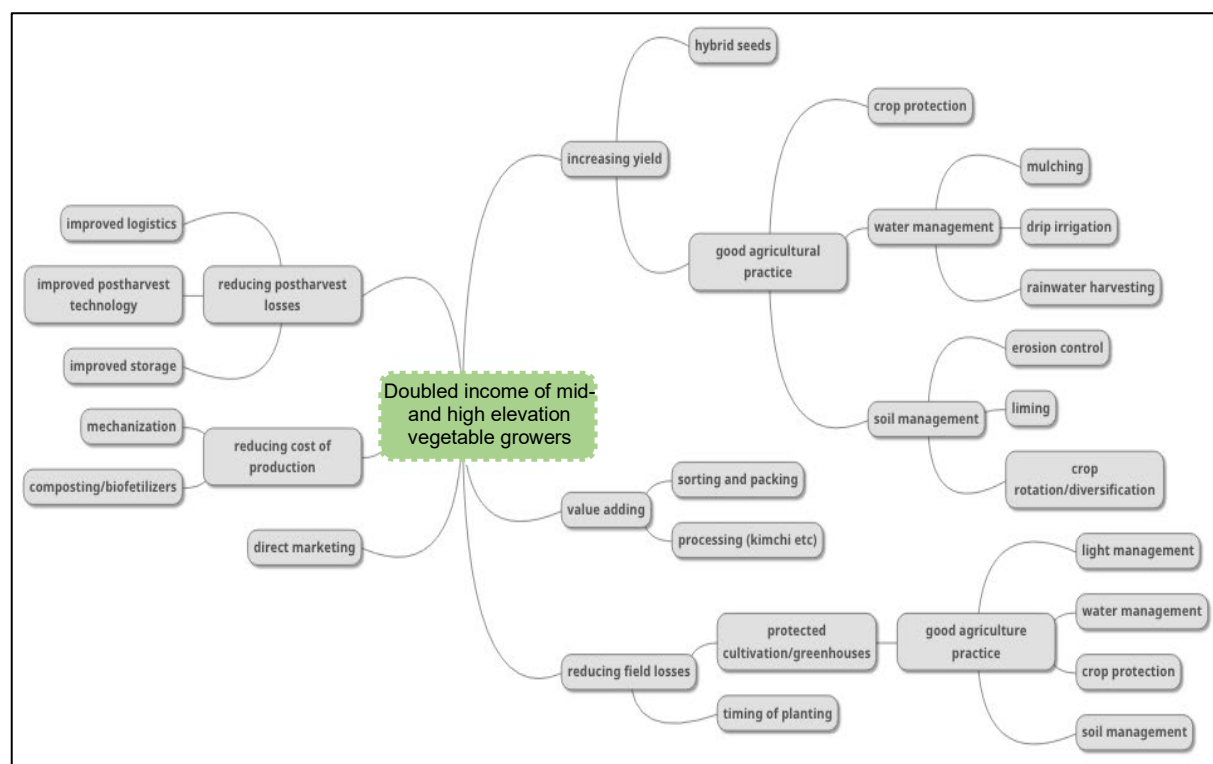
### ***Urban Farms***

Urban farming will be our best chance of feeding Metro Manila and other big cities sustainably into the far future. It is the system that has the least physical limit. Pushed to the extreme of human ingenuity, urban farming will be much less subject to the limitations of land, water, pests, global warming, calamitous weather, pollution, and labor that constrain contemporary farms. It can utilize practically limitless vertical space, purify seawater, isolate its facility from temperature and weather extremes, pests and diseases of plants and animals, reprocess its waste, and reduce labor by automation. Its main input and ultimate limit is energy, but energy is practically limitless coming from the sun. At the moment, all of humanity is using only a small fraction of this energy—less than one percent by some estimates. Technology is making energy cheaper every year, thus it is only a matter of time when food from urban farming can be cost-competitive with food from the sea and terrestrial farms. Combined with development of appropriate production systems, urban farming can produce practically every food component that can be produced by sea and land farming.

Just a decade ago, urban farming could only produce lettuce, tomato, and similar short-season high-value food crops. Today, new technologies are available to produce meat in the lab, without growing animals; thus it is not inconceivable that, in the future, every household can have a food factory that can produce most of what it needs. This is the ultimate in food security. For this to happen by 2030, considerable investment is needed for technology transfer and local R&D.



**Figure 2.7: Pathways for Doubling the Income of Mid- and High-elevation Vegetable Growers**



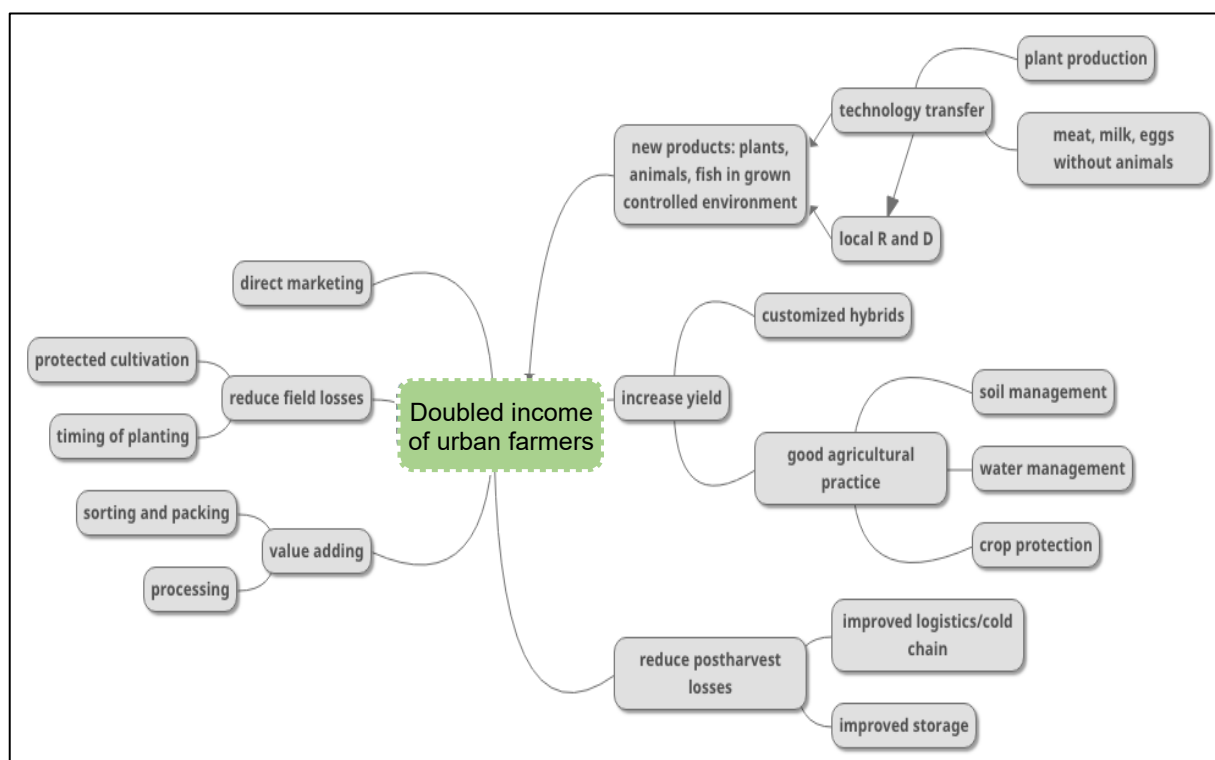
Between now and 2030, increasing sophistication in organization and technology in urban gardening is expected. Among the options are landscape gardening, community gardening using vacant lots and buildings, hydroponics, and an increasing use of vertical space. Creating the path for urban farming is a futuristic project of the University of the Philippines called SPICE Project. The strategy of the project is similar to that of the new artisan farms, that is, a multifunctional model for food production, but it is focused on controlled environments.

Unlike the new artisan farms that are privately owned, the SPICE Project is a government initiative with funding provided by the Department of Science and Technology. The idea is to establish a facility that can serve multiple functions: R&D, genetic resources conservation, food production, education, entertainment, and marketing. Hobbyists and experienced investors like in the case of artisan farms should be encouraged to replicate the concept. A new curriculum for training urban farmers can spin out of this university-based project.

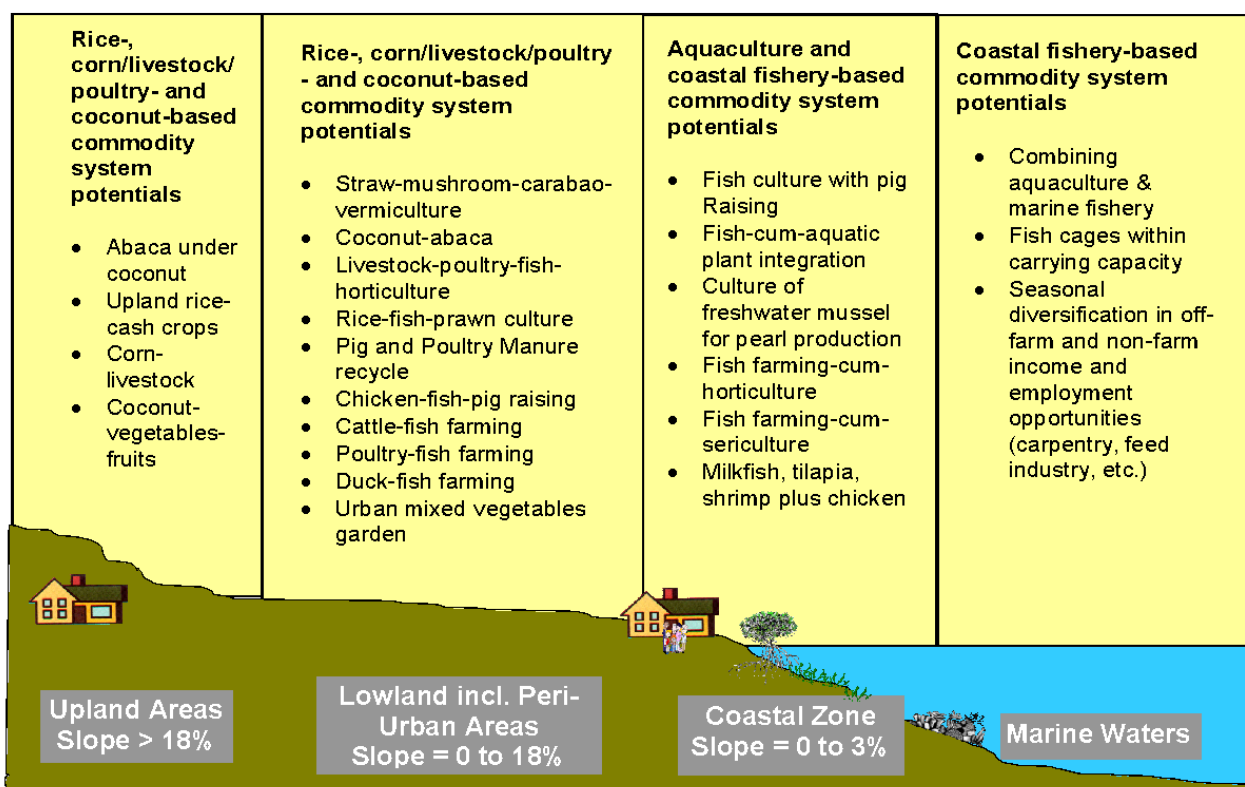
By 2030, urban farming could develop into three types: conventional, organic, and high-tech. The bulk of the food supply will likely progressively shift toward organic and high-tech. Communities ought to be required by law to set aside facilities for these, but their operation can be private (leased to investors) or done by the community itself through appropriate mechanisms such as cooperatives. The pathways for doubling the income of urban farmers is shown in Figure 2.8.

In summary, Figure 2.9 illustrates possibilities for commodity systems across various agri-ecosystems from ridge to reef.

**Figure 2.8: Pathways for Doubling the Income of Urban Farmers**



**Figure 2.9: Illustrative Combinations of Crops, Livestock and Poultry, and Fishery in Commodity System-based Planning**



## Marketing in the New Food System

The food marketing landscape has been quickly reshaped by technology. When home quarantine was imposed during the COVID-19 pandemic, there was a surge in demand for online food purchases. To meet this demand, entrepreneurs quickly organized home food deliveries ranging from 25-kg rice bags to ready-to-eat meals. Many of the entrepreneurs are farmers while the others partnered with farmers. This system is more flexible than existing wet markets, ambulant vendors, and deliveries from restaurants, because they can deliver a wider choice of foodstuff in fresh form. Since long distance transport was hampered by travel restrictions, most of these products were sourced within or near communities. New trade relationships were established, and it is likely that these relationships will endure as consumers have realized the advantages of this new system. This new marketing model can benefit from improved quality control and traceability.

Digital technologies will enable an efficient marketing system and a closer connection of consumers to their food sources. Real time feedback mechanisms also allow consumers to rate suppliers, and suppliers to know market demand.

## Toward a Circular Food Economy

Every step in the food system generates waste. In a rice farm, this consists of straw. During marketing, packaging materials made of plastic and wasted food end up in the landfill. At the consumer level, they end up as sewage. These wastes have the potential to be converted into energy and useful materials such as fertilizer. Instead, they pollute the soil, water, and air.

Reverse logistics and waste processing will enable efficient utilization of these wastes, but more importantly for farming, recover nutrients and send them back to the farms. Of critical importance is phosphorus, a nutrient needed by plants in large quantities. It is mined and mixed in commercial fertilizer, but its traditional sources are close to being depleted. With improved waste handling and extraction technology, more valuable materials that are in short supply can be recovered from waste. Eventually, waste processors will pay for the waste as its value as a resource is recognized.

Moreover, the use of biodegradable food packaging will create an additional industry that will offer new opportunities for farmers. Diversified and integrated farming and clean aquaculture technologies will reduce pollution by recycling nutrients.

Rice straw, one of the main waste materials in the Philippine food system, has many uses. Yet farmers still burn them in spite of legal prohibitions. If the law cannot stop burning, economics will. In areas where onions and garlic follow rice, rice straw is sold for use as mulching material. This resource can also be used to feed livestock, or as mushroom substrate. If production of these products will be stimulated by increased demand, rice straw burning will stop, and rice straw will become a regular revenue source. An ongoing project is developing the technology for collecting methane gas produced by rotting straw. Another project aims to utilize rice straw directly as energy source by controlled combustion.

Rice hull and rice bran are by-products of rice milling. They are now being used in many ways and bring additional income. Specifically, rice bran is not only useful as livestock feed; it is a raw material for extraction of high-value health, nutrition, and pharmaceutical products.

The economic benefits from converting biomass wastes into energy and value-added products partly justify continued local rice production even if imported rice is cheaper. With good processing technology, they can substantially contribute to the local economy. Imported rice

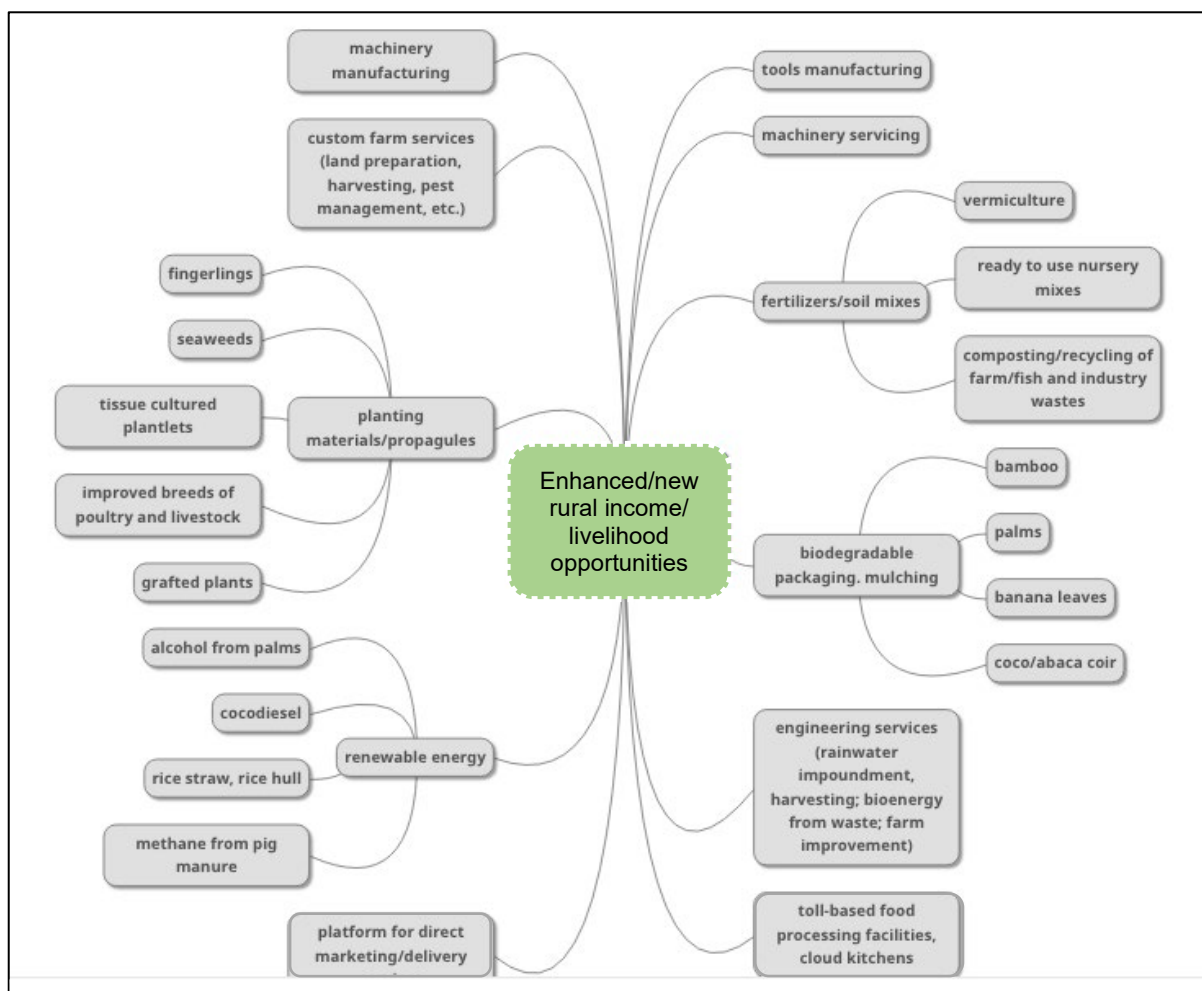
comes in the form of milled grain, thus the valuable waste and by-products are left in the country of origin.

### Food Systems as an Engine for Job Generation and Rural Transformation

One advantage of the systems approach in assessing possibilities for an agri-fishery led development is that it opens new opportunities that either have not been noticed before or have been taken for granted. Provision of goods and services to the farming sector is among these. Belonging to these category are tools manufacturing (we now import most of our hand tools such as hoes, bolos, rakes, and shovels), and machinery fabrication. The range of possibilities is illustrated in in Figure 2.10.

It may be noted that these possibilities are open to investors and entrepreneurs who are not necessarily farmers. Skills needed range from digital technology to designing irrigation systems. Exploited properly, these possibilities can offer jobs to those who became jobless because of the pandemic during the recovery phase, and will continue to generate jobs into the farm future.

**Figure 2.10: Pathways to Enhanced/New Rural Income/Livelihood Opportunities**



## Policy Imperatives for the Improvement of the Food System

Many enabling laws such as those covering agri-fisheries modernization, rice tariffication, farm tourism, and seed industry development are already in place. The most recent is the *Balik Probinsya* (back to rural communities) program, which seeks to decongest Metro Manila by making it attractive for its population to relocate to the countryside. Additional policy initiatives are needed in the following areas:

1. **Education.** A comprehensive food system education is needed at all levels. This program will highlight the consequences of personal food choices on important society issues. Urban agriculture focused on the new controlled environment food production technologies must be developed as a distinct branch of agriculture or a new branch of technology altogether. Education of health care workers must cover nutrition, health, and preventive medicine.
2. **Feeding programs** based on the planetary health diet (PHD) must be sustained in all primary schools and in all government programs where some government subsidy for food is provided.
3. **Preventive medicine.** The PHD must be recognized as an essential preventive health care component of the Universal Health Care (UHC) program. The government must actively and sustainably campaign for the general acceptance of PHD using funds from the UHC.
4. **Research and development (R&D)**
5. Provide increased funding for government R&D and incentives for companies to apply Fourth Industrial Revolution (4IR) technologies in the food system. Suggested priority areas:
  - a. Food technology to convert commodities and new food materials such as insects and microorganisms into high value products;
  - b. Controlled environment food production;
  - c. Waste management;
  - d. Conservation and culture of neglected crops, aquatic species, and potential future sources of food such as microorganisms and insects;
  - e. Multi-species integrated farming on land and water; and
  - f. Digital platforms for enhanced integration of components of the food system.
6. **Rationalize restrictions on bioprospecting and biotechnology.**
7. **Global competitiveness and farmer income.** The recently implemented Rice Tariffication Law provides substantial funds for mechanization to ensure competitiveness of the rice sector. Other critical policy areas for rice and the rest of the farming sector are:
  - a. Land and water use laws;
  - b. Farm consolidation;
  - c. Private sector participation in priority areas such as integrated multitrophic aquaculture (IMTA) and rural agri-based industrialization;
  - d. Direct selling by farmers by promoting such activities as online marketing, farmers' markets, community supported agriculture, and food terminals; and
  - e. Direct and indirect compensation for farm workers.
8. **Calamities.** Prepare by:
  - a. Geographic dispersal of production areas of all foodstuff that are needed/will be needed in quantity, such as rice, fish, corn, grain legumes, vegetables, root and tuber crops; and
  - b. Expansion of food storage and handling capacity.

9. **Environment.** Among the needed policies are:
  - a. Sustained community involvement in the clean-up of Manila Bay, Laguna Lake, and rivers of Metro Manila;
  - b. Rewarding environment-friendly farm and aquaculture practices and taxing those unable to improve farming practice; linking subsidy programs to environmental care targets;
  - c. Rewarding recycling and other activities that promote circularity in the food system; e.g., rainwater collection;
  - d. Banning or reducing the use of plastics; and
  - e. Encouraging the use of local biodegradable materials for food packaging.
10. **Finance.** Part of government funds for the rice and coconut sectors (e.g., tariff and levy funds) must be allocated for farm diversification to improve farmers' income to a level above subsistence. Additionally,
  - a. Banks are required by law to allocate 25% of their loanable funds for farming. Government should help the banks to comply.
  - b. Full utilization of digital technology in banking particularly in rural areas ought to provide easy access of capital by farmers.
11. **Infrastructure.** This refers specifically to digital and physical infrastructure. Lowering the cost and increasing efficiency of inter-island logistics to broaden food supply base of Metro Manila is a priority concern.
12. **Food security**
  - a. Tightly regulating farm land fragmentation and conversion
  - b. Promoting new community and housing designs to provide for rainwater collection and facilities for controlled environment production systems within residential buildings
  - c. Securing fishery resources, particularly in the West Philippine Sea
  - d. Protecting watershed areas
  - e. Making food security a local government priority
13. **Energy.** Low-cost, decentralized renewable energy will be needed for irrigation, primary processing, cold storage, and controlled-environment food production, among others. Aggressive policies such as tax exemption or subsidy are needed to make this happen soon.
14. **Create a Department of Fisheries and Oceans.** This new executive department should be at the same level as the Department of Agriculture and would complement its work. This should generate the amount of support that the country's fisheries sector deserves given our vast marine and aquatic resources.

## Investment Programming, Resource Leveraging, and Mobilization Services

Investment programming flows from AFMP/NAFMIP preparation. It is the process of rational listing of programs, projects, and activities (PPAs) to be undertaken within the short- and medium-term. It is for the purpose of enhancing the processes of asset generation, capital accumulation, and overall financial and expenditure management for the achievement of desired future benefits for the sector, which are expected to contribute to national growth.

Investment programming entails the systematic and rational identification, selection, preparation, scheduling, and phasing of PPAs given the scarce public financial resources and



limited access to other fund sources. The output of the process is a Public Investment Program (PIP).<sup>7</sup>

A number of observations had been made with respect to investment programming linked to AFMP preparation (OIDCI, 2018). These are enumerated below with the indicative PPAs to better align the DA New Thinking and the OneDA holistic approach to agri-fisheries transformation.

1. *The distribution of investment resources across AFMA components had remained practically the same over the years.*

It is notable that the share of irrigation development declined from 20% in 2014 to 10% in 2017. On other hand, the share of agricultural equipment and facilities support services; extension support, education and training services; and research and development slightly increased.

**Indicative PPAs:** In the NAFMIP 2020-2030, market development can be intensified through larger and more regular DA funding for value chain analysis and project feasibility studies. DA can promote initial catalytic investments in critical post-harvest facilities, e.g., commodity-neutral cold storage or warehouses in particular areas not being prioritized by the private sector. Advocacy services can include investment promotion in rural areas.

2. *Modernization would mean government investments in large infrastructure and machines.*

Build capacity to strengthen organizations to take over the maintenance and subsequent replacement of such, and to ensure sustainability of investments.

**Indicative PPAs:** In the NAFMIP 2020-2030, government will invest only in selected large catalytic projects in line with the Agri-Industrial Growth Corridor Approach. Large catalytic projects will be meant only to demonstrate long-term feasibility for eventual private sector takeover, maintenance, upscaling and replication.

3. *PPAs are focused on single commodities and not on specific zones, thus spreading resources too thinly.*

Resource allocation can be devoted to priority commodities within appropriate zones so that support services can also be focused. Plans of LGUs, DA, DAR, DENR, etc. should be harmonized.

**Indicative PPAs:** In the NAFMIP 2020-2030, investments will be concentrated in Agri-Industrial Growth Corridors specializing in particular commodities, commodity products, and high value chain segments linked to clusters of farmers and fishers. At the regional level, ICT-supported integrated spatial planning (ridge-to-reef) will be conducted as framework for promoting/enhancing physical, financial, organizational, and other linkages between and among agglomerated investments.

4. *Sustainability requires intensive advocacy campaign for “facilitation” type of interventions from the government instead of dole-out strategies.*

**Indicative PPAs:** In the NAFMIP 2020-2030, financing of catalytic livelihood and enterprise development projects will be promoted by DA, LGUs, and other NGAs where necessary to

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<sup>7</sup> Adapted from the Manual on Investment Programming and Management for the Department of Agriculture, October 2018

facilitate sustainable non-government sector investments through “demonstration effects.” The non-government sector will include farmer and fisher organizations.

5. *LGUs that prioritize agri-fisheries development in their comprehensive plan most especially those that are dependent on agriculture and fishery based industries must be encouraged through monetary and non-monetary means.*

**Indicative PPAs:** In the NAFMIP 2020-2030, the DA and other NGAs can provide LGUs with a range of support complementing substantial increases in the Internal Revenue Allotment (IRA) arising from the effectivity of the Mandanas Ruling starting in Fiscal Year 2022. While LGUs can finance more infrastructure, the DA and NGAs can provide capacity-building, as well as support for planning and investment programming and monitoring and evaluation.

6. *While there are no specific criteria for PPA prioritization, DA Infrastructure projects are based on:*
  - a. *agri-industrial potential;*
  - b. *socio-economic contributions of the investments;*
  - c. *absence of public investment; and*
  - d. *presence of agrarian reform beneficiaries and other small farmers and fishers.*

**Indicative PPAs:** In the NAFMIP 2020-2030, a system for prioritizing possible investments will be provided, and actual priority investments will be recommended. An illustrative prioritization matrix is shown in Table 2.3, based on a form being developed by the DA PMS Investment Programming Division.

**Table 2.3: Illustrative PPA Prioritization System**

CRITERIA	WEIGHT (%)	RAW SCORE	WEIGHTED SCORE	REMARKS
1. Responsiveness to DA New Thinking and OneDA approach	10%			
2. Contribution to capacity development	10%			
3. Strength of links with past PPAs (scaling up, replicating best practices, promoting economies of scale)	10%			
4. Linkage with other on-going or planned PPAs (“integrating investment planning”)	10%			
5. Degree of strategic importance in strengthening the target value chain	10%			
6. Degree of potential impact or result contributing to overall sector growth (contribution to <b>sustainable</b> increases in value-added)	10%			
7. Degree of potential to increase or diversify incomes of farmers, livestock raisers, and/ or fishers	10%			
8. Urgency of the proposed PPA (addresses major, recurring,	10%			



CRITERIA	WEIGHT (%)	RAW SCORE	WEIGHTED SCORE	REMARKS
or emerging challenges in the sector)				
9. Integration of risk management measures	10%			
10. Implementation readiness based on funds committed by target investors (LGU, private sector, etc.)	10%			
<b>Total</b>	<b>100%</b>			

Note:

- a. The weight of each criterion is 10%.
- b. Possible score per criterion will range from 1 to 4: 1-strongly disagree; 2-disagree; 3-agree; 4-strongly agree.
- c. Criteria No. 1, 2, 3 are answerable by yes or no. Thus, the score for each criterion will either be 1 (for “no” answer) or 4 (for “yes” answer).
- d. Use the Remarks column to explain the rating for each criterion.

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## CHAPTER 3

### State of the Philippines' Agri-Fishery-Food Value Chains<sup>8</sup>

The 2011-2017 AFMP Sectoral Assessment report mentioned developing value chain analyses alongside LGUs to identify priority commodities in their respective areas (OICDI, 2017). This is because of the good practices seen during the Philippine Rural Development Project (PRDP) implementation. This should be institutionalized particularly in using them in determining investment in key industries (OICDI, 2017; DA, 2018).

In the 2018-2023 AFMP, one of the sectoral outcomes is to broaden farmer and fisher access and participation in value chain development. Based on previous learnings and challenges, this is in line with one of the intervention themes identified: agribusiness and agripreneurship (2018-2023 AFMP). First, the value chain must be clearly and well defined; and identify where traditional producers, farmers and fishers, can participate. Then, improve their financial capacity, technical know-how, organizations, and market linkages. All these help in tapping market potentials and maximizing societal welfare. Farmers and fishers “can benefit from the increased capacity of the chains to monitor markets and respond innovatively to changing conditions and requirements” (2018-2023 AFMP).

A review of the literature on the Philippine's agri-fishery-food value chains and systems shows that these types of studies are quite sparse, outdated, and mostly comprising case studies focused on specific commodities or products that often lack rigorous analysis. An exception in terms of more systematic analysis are the value chain related works of PIDS,<sup>9</sup> which we use extensively in this study. Most studies focus on the traditional grains, i.e., rice and to some extent, corn (yellow) for animal feed; and traditional export crops (sugar and coconut), some fishery studies, and recently (because of the African swine fever pandemic), the livestock and poultry subsector.

The focus of many agri-fishery-food value chain studies on the traditional crops seems to reflect the government's commodity priorities and its focus on attaining food security through food self-sufficiency. Since the 1970s (prior to AFMA) up to the present, the composition of agri-fishery subsector groups by traditional and nontraditional categories has hardly changed. The importance of the traditional cereal and export crops is illustrated by their continued large contribution in both the Gross Value Added (GVA) of the agri-fishery sector and employment (Tables 3.1 and 3.2). Ironically, these subsectors also register high poverty incidence (Table 3.2).

Despite the fairly comprehensive set of government measures that, among others, should have influenced agri-fishery commodity and production diversification as well as agri-fishery-food value chain development, such measures may not have served as major drivers for the proliferation of and leveling up of agri-fishery-food value chains. However, like in other developing economies with robust agri-fishery-food value chains, increasing incomes, urbanization, changing consumer food preferences, and the growing partiality of consumers for convenience food have served as the impetus for the emergence of high-value crops and agri-fishery-food chains, the mushrooming of fast-food chains, and rise of supermarkets. As observed in the literature, majority of these new agri-fishery commodities and products were

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<sup>8</sup> Prepared by Marites M. Tiongco, PhD, Agricultural Value Chain Expert and Deputy Team Leader, SEARCA and Economics Professor, De La Salle University (DLSU); with Emmanuel D.C. Barnedo, Research Associate, and Miko Johnson Co, Research Assistant. DLSU

<sup>9</sup> A list of relevant studies can be found in the Concept Note of R. Briones (2021, unpublished).

largely for domestic use and are serving mainly key urban markets.<sup>10</sup> In 2019, the country's retail sales value was about US\$50 billion, a twofold increase from its 2010 value wherein spending on food was the highest expenditure item for Filipino households, amounting to PHP3 trillion in 2019 (Statista, 2021). On the other hand, food processing comprised 10 percent of GDP in 2020.

What may be discerned from the limited literature on the state of agri-fishery-food value chains in the country and what these may mean in the context of the AFMA and its implications on influencing the upward movement on the value-added ladder of these value chains are the following observations (these are further explored in this agri-fishery-food value chain paper):

**Table 3.5: GVA Average Share and Growth Rate of Subsectors of Agriculture, Fishery and Forestry (AFF) at Constant 2018 prices, from 2000-2020 (in percent)**

SUBSECTOR	AVERAGE SHARE	AVERAGE GROWTH RATES
<b>Traditional crops</b>	<b>28.9</b>	<b>1.7</b>
Rice	23.4	1.4
Corn	5.5	3.3
<b>Traditional exports</b>	<b>7.6</b>	<b>1.0</b>
Coconut	5.7	0.8
Sugar	1.9	2.4
<b>High value crops</b>	<b>14.1</b>	<b>1.5</b>
Banana	8.2	2.3
Mango	2.7	-0.2
Pineapple	1.5	2.4
Coffee	0.6	-3.9
Cassava	1.1	2.2
Rubber	0.6	2.5
Cacao	0.1	1.5
<b>Livestock and Poultry</b>	<b>22.9</b>	<b>3.8</b>
Livestock	12.4	2.4
Poultry and egg production	8.2	4.1
Other animal production	2.2	12.4
<b>Fishing and aquaculture</b>	<b>12.1</b>	<b>4.0</b>
<b>Support activities to AFF</b>	<b>7.6</b>	<b>5.9</b>
<b>Others</b>	<b>6.9</b>	<b>1.8</b>
Abaca	0.1	0.6
Tobacco	0.1	-0.9
Other agricultural crops	5.8	1.9
Forestry and logging	0.1	6.0
<b>AFF</b>	<b>100.0</b>	<b>2.6</b>

Source: Philippine Statistics Authority (PSA)

<sup>10</sup> Aside from being the seat of government, the National Capital Region is the single largest local food market, with US\$9.3 billion equivalent value every year, and a share of 18.5 percent of the total annual food expense of the country (PSA, 2019 as cited in <https://aciarc.gov.au/publication/covid19/7-covid-19-and-food-systems-philippines>)

**Table 3.2: Shares by Group and Sub-group, in Workers' Population, 2015 (in percent)**

GROUP	SUBGROUP	IN GROUP	OF POOR, IN SUB GROUP	OF POOR, IN GROUP
Population		100	23.3	100
	Rural	60.1	30.7	79
	Urban	39.9	12.3	21
Labor Force		100	20	100
	Unemployed	2.8	18.8	2.6
Workers		100	20	100
	Underemployed	23.6	29	34.2
	Visibly underemployed	12.1	34.2	20.6
	Agricultural workers	35	35.7	62.4
Agricultural workers		100	35.7	100
	Rice	17	26.5	12.6
	Corn	11	51.8	15.9
	Coconut	6.2	38.2	6.7
	Vegetables	3.7	26.9	2.8
	Other crops	4.2	38.2	4.5
	Farm workers	32.9	39.6	37.8
	Underemployed	34.1	43.4	54.8
	Visibly underemployed	18.9	43.8	33.1

Source: Briones (2017)

First, as in other developing economies, there has been rapid (albeit a late push and a generally lackluster one when compared to our ASEAN country neighbors) but differentiated transformations of agri-fishery-food value chains in the country (see various PIDS value chain and agri-industry studies). Majority are in the transitioning value-added ladder stage, are dominated by micro, small, and medium enterprises (MSMEs) that are engaged in wholesale and retail trade, a few on food processing, and others in food services and accommodation. Many of these midstream and downstream activities of agri-fishery-food value chains are located in peri-urban areas that are proximate to large urban centers like NCR (ADB, 2020).<sup>11</sup> These activities and actors, however, were not the priority beneficiaries of the AFMA since the focus of AFMA was on agriculture production.

Second, value chain development will need to look at the role of government and its measures from both the supply and the demand side. Agri-fishery-food value chains are a composite of several inter-linked activities (involving numerous actors) that connect agriculture-farm-fishery-livestock production to the final end-consumers. The linkage is not unidirectional nor static. A feedback mechanism from each value chain segment and from consumers and other stakeholders have to be taken into account to understand the nature and pace of agri-fishery-food value chain development. It would be interesting to examine if AFMA implementation has developed mechanisms that will benefit from these feedback loops and subsequently be able to finetune the AFMA measures. While the study's recommendations are on improving agriculture production and productivity, it also examines if the productivity related measures at the farm production level have effectively influenced changes in the agriculture value chain's

<sup>11</sup>A case in point is vegetable production, which registered a 2.7% from 2000 to 2010. It is mostly concentrated in the Cordillera Autonomous Region (CAR). CAR supplies 75 to 80% of Metro Manila's demand of highland vegetables, while other production areas are concentrated in Cebu, and Negros Oriental in Central Visayas, Bukidnon in Northern Mindanao, and Davao City and Davao del Sur in Davao Region. Lowland vegetables, meantime, come from provinces such as Quezon, Laguna, Pangasinan, La Union, and Bulacan (<https://www.jica.go.jp/philippine/english/office/topics/news/190603.html>).

structure, conduct, and performance. Further, the role of the private sector in the agri-fishery-food value chains toward improving the productivity of the various segments of the value chains and how they also respond to the AFMA productivity measures for agriculture and fisheries are also examined.

Another important aspect stipulated in the AFMA is the need not just for private-public sector collaboration; but also for inter-agency collaboration and coordination especially in encouraging agri-fishery-food chain development. Measures for agri-fishery-food value chains will need to be implemented in a coherent and coordinated fashion by several government agencies such as the DA, DTI, DENR, DAR, and LGUs. How these are pursued and what accountability and transparency measures are in place to ensure effective inter-agency collaboration will be discussed in the paper.

Third, mature agri-based value chains (or those chains that have existed for a fairly long period of time) dominate in the rice, coconut, and sugar products. As the literature illustrates, a combination of traditional value chains—small-scale farmers who sell to small traders and processors and these in turn, sell directly to nearby local markets; transitioning value chains—long chains with numerous MSMEs that link farms with end-consumers, which characterize majority of these agri-food value chains; and modern value chains—but not as modern or advanced as those found in Vietnam and Thailand—operate. Traditional forms of agri-food value chains that characterize mainly the remote rice and coconut farms, whose households also belong to the poverty income rung, are on the demise. Majority of the small-scale farmers and fishers are commercializing and are transforming from net sellers to net buyers of food. The few modern agri-fishery-food value chains in these commodities show the dominance of the processing mills. Among the three, only coconut products are one of the country's major agriculture export earners, but their significance in the world market is increasingly being threatened by substitutes and other country rivals, e.g., Indonesia (Dy 2021). Domestic rice production is highly protected through price support and tariff measures, although these have been reduced with the enactment of the Rice Tariffication Law in 2019. The sugar sector is also governed by numerous regulations and restrictive trade policies (Briones 2020).

The mediocre performance of the coconut value chains despite their high potential as export commodities mirrors the state of many of the agri-fisheries export value chains. Relative to rice, which receives the bulk of the government's scarce resources for the agri-fisheries sector, the agri-fishery-food exportable products and the value chains that support them obtain limited government support. This may explain the continued downhill trend of the share of agri-fisheries exports to the country's total export revenues (Table 3.3) (Clarete, 2021) wherein the government is not properly harnessing the high revealed comparative advantage indices of a variety of agri-fishery-food value chains that operate in the country (Clarete, 2021).<sup>12</sup> Key areas that these exportable agri-fishery-food value chains will need government attention and do not seem to be addressed in the AFMA as means of encouraging and supporting value-adding progress are the high production and trade transaction costs encountered by the exportable agri-fishery-food value chains that relate to policies and infrastructure, as listed in Table 3.3.

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<sup>12</sup>The country is not harnessing its agri-fisheries export potentials. In Clarete's presentation at the DA's Food Security Summit last May 18, 2021, he showed that the revealed comparative advantage of the top 20 agri-fisheries exports was 43.01. However, the revealed comparative advantage of the 21-40 top agri-fisheries exports was averaging at a high of 273.32.

**Table 3.3: Problems with Value-Adding Process in the Philippines**

GENERAL PROBLEM	SPECIFICS
High production costs	Access to finance, tax regime, lack of affordable quality inputs, low quality transport and utilities
High trading costs at the borders	Trade finance, low quality transport and telecommunications infrastructure, trade and customs regimes, poor SPS and food safety regulations and implementation
Need for sound and stable macro policy environment	Exchange rate Inflation rate

Source: Clarete, 2018

NAFMIP will consider sustainable measures that will tackle the shocks and ensure an agri-fishery-food value chain that will take into consideration food and nutrition security, and sustainable growth.

### Highlights of Accomplishments in Agribusiness and Marketing

Under AFMP 2011-2017, the Agribusiness and Marketing Assistance Service (AMAS) is responsible for the agribusiness and market development support services. Its accomplishments in this area are summarized in Table 3.4.

**Table 3.4: AFMP Accomplishments, Gaps, and Recommendations in Agribusiness and Marketing**

AFMP TARGETS	ACCOMPLISHMENT	GAPS AND RECOMMENDATIONS
Conduct market research, benchmarking, and competitiveness analyses on priority commodities identified in the Web-based Information System for Entrepreneurs-Producers (WISE), an online data warehousing and reporting system and markets in close coordination with the private sector and SUCs	Two benchmarking studies and market research on coffee and squash (2012)	Limited human resources and knowledge on market research: training or mentoring on RMA of regional staff with partner research institutions, led by AMAS/MDD
Support value chains through (a) consultations with industry stakeholders to identify priority areas of interventions; (b) track agribusiness investments in the value chain and prepare policy briefs/proposals for potential investors; and (c) establish extensive database at the provincial and regional level for	Value chain analysis on pili in WISE, an online data warehousing and reporting system being operationalized.	Extensive database: domestic supply and demand for priority commodities, export and import by country of destination, prices, cost and return analyses, and shares of cost and profit among key players in the commodity supply chain/value chain

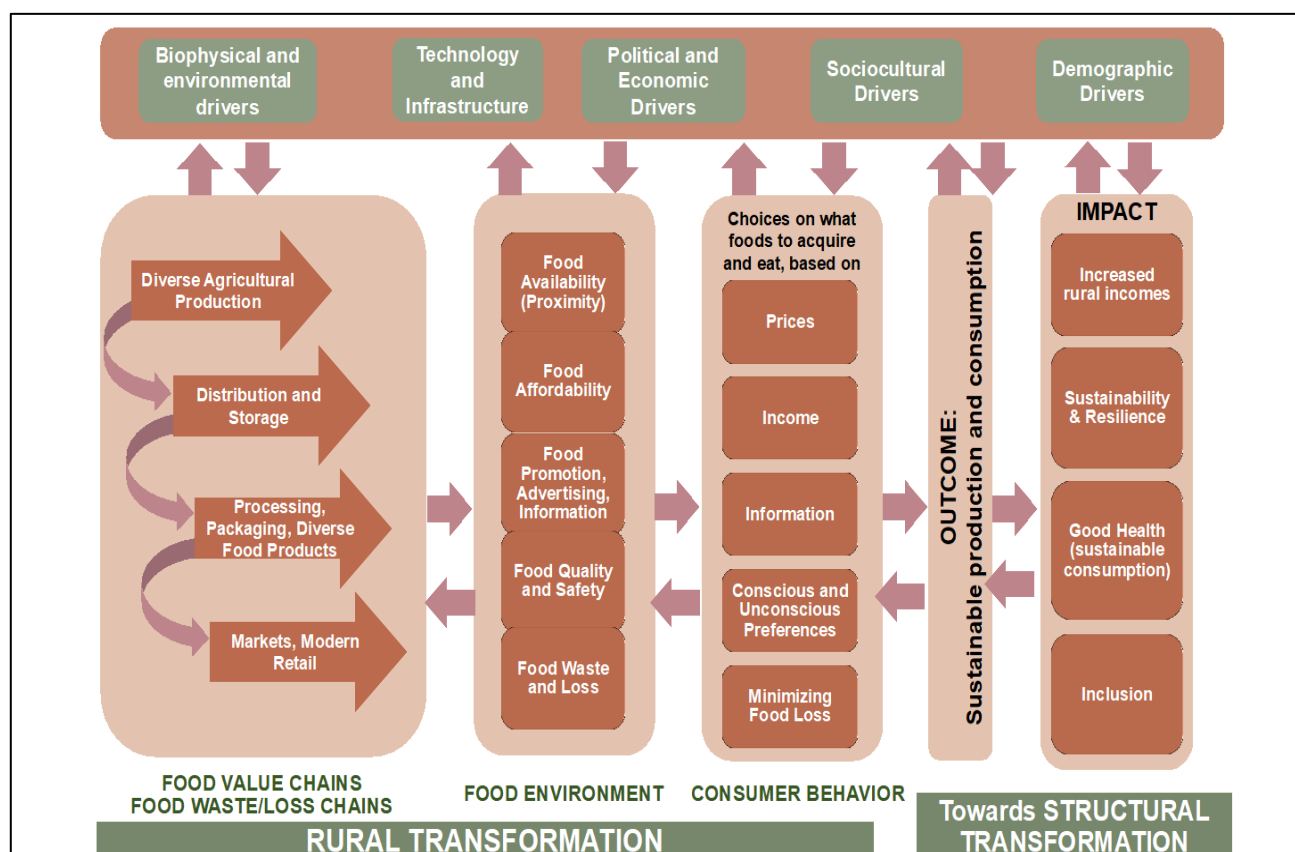


AFMP TARGETS	ACCOMPLISHMENT	GAPS AND RECOMMENDATIONS
commodity supply/value chain analysis		
Facilitate arrangements for food processors, manufacturers and exporters to source their raw materials from MSMEs and small farmer and fisher cooperatives and groups		
Promote agricultural and fisheries-based products in local and international markets through participation in national and international trade fairs and exhibits, selling missions, market matching initiatives, and other promotional activities. Partnerships with DTI, agricultural attachés, LGUs, and private groups are strengthened	16 international trade fairs, 15 local trade fairs by 160 exhibitors/enterprises	<ul style="list-style-type: none"> <li>• Continue monitoring book sales and sales under negotiation to determine the number and types of enterprises that forge marketing contracts and those that sustain the supply of agri-based products to local and foreign markets</li> <li>• Strengthen partnership with DTI to further enhance the provision of agribusiness and market development services through cost-sharing and staff complementation in sponsoring investment fora, trade fairs and exhibits for agricultural and fishery products in the domestic and foreign markets.</li> </ul>
Monitor the status of the marketing infrastructure such as trading centers and food terminals established by the DA with private sector participation	<ul style="list-style-type: none"> <li>• 10 out of the targeted 23 Agri-Pinoy Trading Centers (APTCs) completed and operational</li> <li>• 22 municipal food terminals and nine barangay food terminals are still ongoing or for launching</li> <li>• 30-40% of the total food terminals are non-operational</li> </ul>	
Provide reliable market information through active AFMIS	Price information twice a week, uploaded in price watch website of the DA-Information and Communications Technology Service (ICTS)	<ul style="list-style-type: none"> <li>• Create a Management and Technical Working Group to operationalize the AFMIS</li> <li>• Maintain close coordination between DA and PSA to ensure collection of relevant agriculture data</li> </ul>

## Food Systems Framework

A **food systems framework**, aptly described by Reardon et. al. (2018) as “the dendritic cluster of value chains,” provides a holistic analysis of the dynamic linkages and interactions of the three components of the food systems: (1) agri-fisheries based food value chains, (2) the food environment, and (3) consumer behavior (Figure 3.1).

**Figure 3.1: Food Systems Framework**



Adapted from Figure 1 of Brower, I.; J. McDermott; and R. Ruben (2020)

The **agri-fishery-food value chains** component comprises the upstream (resources and inputs) segment, which is linked to agr-fisheries production (crops, livestock, fishery, and forestry commodities), and in turn is linked to the midstream (consolidation/distribution, storage, processing and packaging) and downstream segments of the value chain (markets and retails). The component on **food environment** refers to (1) the availability and affordability of the commodities and food products, (2) the requisites of information, promotion, advertising, communication, (3) and attributes on food safety and quality. These two components of the food systems, i.e., the agri-fishery-food value chains and food environment, constitute the supply side components of the food systems.

The third component of the food system describes the demand side, which is typified by consumer behavior, i.e., consumers’ choices on what food to buy and eat are based on income, prices, preferences, and information. The interactions of these three components of the food system are dynamic, i.e., (1) two-way horizontal linkage and feedback mechanisms that are influenced by the dominant players or actors affecting the supply and demand sides, and (2) the drivers of changes that include biophysical and environmental, e.g., climate change; technology and infrastructure covered by aspects of AFMA; political and economic,



e.g., political vested interest groups, growth, market-oriented policies, and trade; demographic, e.g., extent of urbanization; and socio-cultural factors.

The interactions and linkages of the food system components with the drivers of change contribute to the development outcomes, e.g., of improved dietary choices, and impacts such as sustainability, resilience, and inclusiveness. The nature and degree of interactions and interrelations of the supply and demand components of the food system influence the extent of rural transformation and its contribution to the structural transformation of the economy.

The hypothesis of this paper on AFMA interventions is that their focus on the supply aspects of the food system for particular agri-fishery commodities has hampered the development of diversified food value chains, and has stymied rural transformation and its contribution in accelerating the structural transformation of the country to an upper middle income economy.

As seen in Figure 3.1, the food value chain is one of the components of the food system. It focuses on the activities from farm production to the midstream (from agglomeration) and downstream segments (to processing, logistics, and markets) of the value chain (or the “hidden middle” in most analysis of agri-fishery activities). Technically, another segment of the food value chain is the upstream segment (or backward linkage) where the focus is on resources and inputs used in agri-fisheries production. Emphasis is given on the midstream to downstream segments where additional value creation processes occur, which manifest the agri-fisheries modernization that will spur rural industrialization and the generation of non-farm rural employment.

A variety of definitions of value-adding in food value chains exists, but for this agri-fisheries sector assessment, the concept applies to the following features of value-adding (Table 3.5).

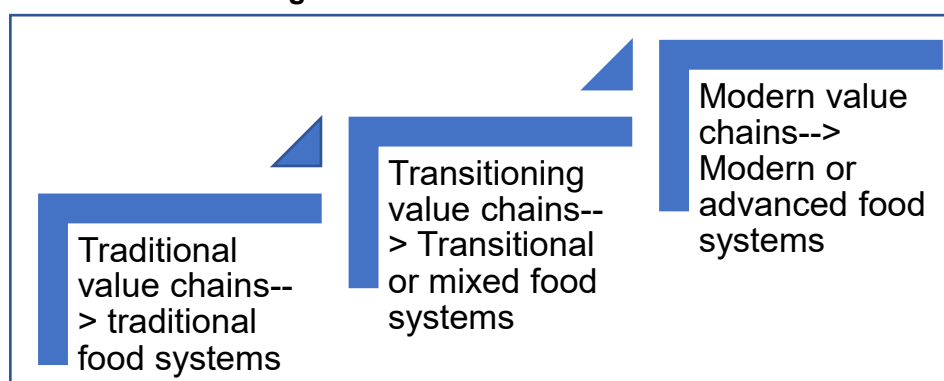
Reardon et. al. (2018) provided a typology of the “value addition ladder” as a step-up process of food value chains (Figure 3.2) with the following features of each value step described in Table 3.6. These can be expanded to illustrate the traditional, transitional or mixed, and advanced or modern food systems (Arslan et. al., 2018). In reality, the value-added steps are not discrete and mutually exclusive. Within agri-fishery-food value chains, a variety of traditional, transitioning, and modern value chains can co-exist. For each step of the ladder, several modalities are possible. From a general food system perspective, hybrids of value-added food value chain networks are present and co-exist depending on the influence and interaction of the drivers of chain in the system’s transformations. In the Asian case for example, the past 25 years saw the rapid transformation of the food value chain and food systems, shifting from traditional systems to a mix of transitioning and modern systems. Reardon and Timmer (2014) identified a confluence of five interlinked transformations:

1. Downstream demand side change “pulling” system transformation brought about by (a) urbanization and (b) rising incomes and diet change;
2. Midstream and/or downstream change or “intermediating” system transformation comprising (c) change in retail, wholesale, logistics, and processing; and
3. Upstream transformations, including (d) intensification of farming, and (e) farm input supply change.

**Table 3.5: Key Features of Value Added in Food Value Chains**

SOURCE	FEATURES
Coltrain, D.; Barton, D.; Boland, M. <i>Value Added: Opportunities and Strategies</i> ; Arthur Capper Cooperative, Center Department of Agricultural Economics, Cooperative Extension Service, Kansas State University: Manhattan, KS, USA, 2000	Value-adding is economically adding value to a product by changing its current place, time, and form to characteristics more preferred in the marketplace
Lu, R.; Dudensing, R. <i>What Do We Mean by Value-added Agriculture?</i> <i>Choices</i> 2015, 30, 316–2016–7795	Value-added agriculture is a portfolio of agricultural practices that refers most generally to manufacturing processes that increase the value of primary agricultural commodities. Value-added agriculture may also refer to increasing the economic value of a commodity through particular production processes, e.g., organic produce, or through regionally-branded products that increase consumer appeal and willingness to pay a premium over similar but undifferentiated products
Amanor-Boadu, V.A. <i>Conversation about Value-Added Agriculture; Value-Added Business Development Program</i> ; Department of Agricultural Economics; Kansas State University: Manhattan, KS, USA, 2003	Value-adding activity has to satisfy two conditions: (1) if one is rewarded for performing any activity that has traditionally been performed at another stage further down the supply chain; or (2) if one is rewarded for performing an activity that is discovered to be necessary, but has never been performed in the supply chain.
Junior, HS de Figueiredo, M.O.M Meuwissen, A.G.G. Oude Lansink. 2020. <i>Integrating structure, conduct and performance into value chain analysis.</i> <i>Journal on Chain and Network Science</i> 2014; 14(1): 21-30	Value adding in a value chain encompasses firms and their end-markets, business processes, supply and demand levels, horizontal and vertical links, and supporting actors providing cross-cutting and sector-specific services. The enabling environment surrounding a chain is the set of global, national and local government regulations and practices creating incentives for private sector growth

**Figure 3.2: Value Addition Ladder**



**Table 3.6: Food Chain's Value Addition Ladder and Features**

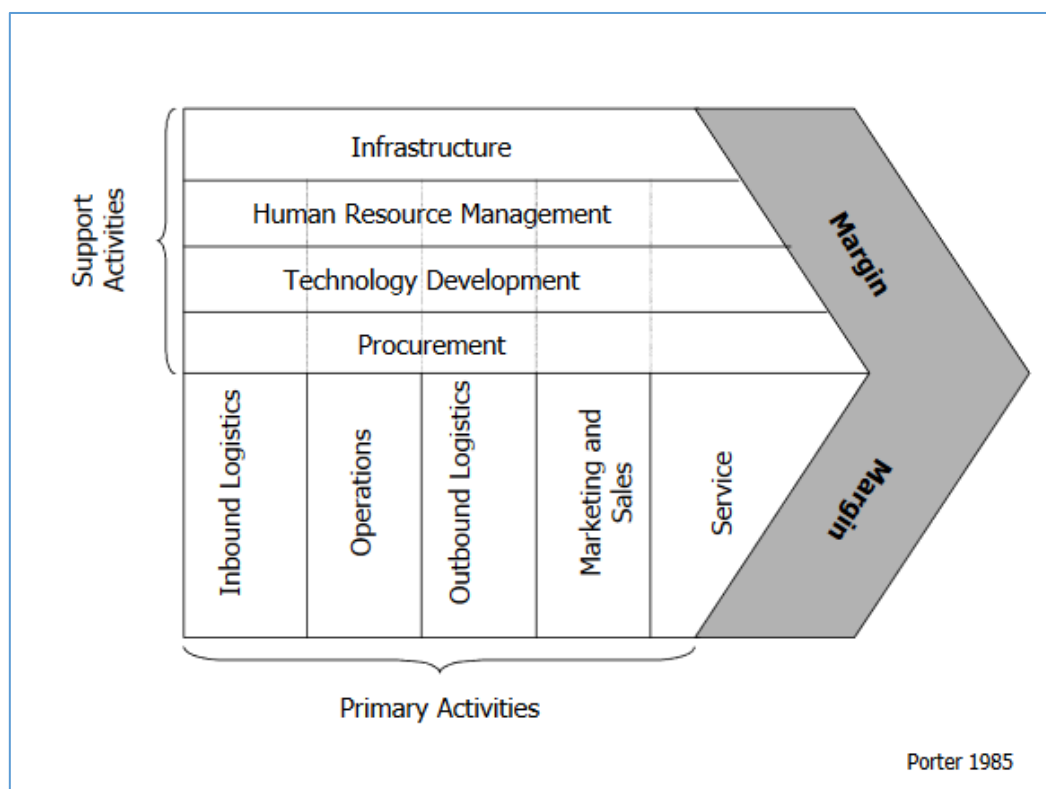
STAGE	FEATURES
Traditional food <i>value</i> chain/traditional food systems	<ul style="list-style-type: none"> <li>• Chains are fragmented and spatially short linking consumers to wet or public markets and producers and operators are mostly family owned using less hired labor and little capital</li> <li>• Spot markets link in all segments</li> <li>• Price takers on inputs, vulnerable to supply disruptions</li> <li>• Prevalence of small-scale farmers/fishers engaged in predominantly local staple production and distribution through informal market outlets</li> </ul>
Transitioning food value chain/ transitional or mixed food systems	<ul style="list-style-type: none"> <li>• Supply chains are long and operations depend on hired labor</li> <li>• Multiple stages between farm and retail are poorly integrated and fragmented</li> <li>• Dominance of small scale farmers/fishers with simple food processing and sales through wet market, street food and corner shops; traders and middlemen take large shares of value added returns</li> </ul>
Modern food value chains/advanced or modern food systems	<ul style="list-style-type: none"> <li>• Closely interlinked from farming to midstream up to consumer markets</li> <li>• Possess greater capacity to adjust and innovate</li> <li>• Fair degree of control over input supplies and marketing channels, greater flexibility to switch between suppliers within their networks and between destination markets, sufficient resources to innovate and “pivot” business operations</li> <li>• Dual small and large/commercial farming more processed and packaged (partly imported) food that is distributed through supermarkets and restaurants</li> </ul>

Source: Reardon and Vos (2021)

### Value Chain in a Food System Approach and Climate-smart Agriculture

In his 1985 book *Competitive Advantage: Creating and Sustaining Superior Performance*, Michael Porter defined “value chain” as a representation of a firm’s value-adding activities (Kumar and Rejeev, 2016), based on its pricing strategy and cost structure (Figure 3.3). Kumar and Rejeev (2016) added that it was influenced by both internal and external forces. The internal forces could be identified within production, marketing, etc.; while the external forces could be technological, ecological, economic, new industry trends, and regulatory development in nature. Understanding the business’ own capabilities and needs of the market was critical in coming up with a competitive strategy.

**Figure 3.3: Basic Value Chain Model of Porter**



Source: as cited by Kumar and Rejeev (2016)

Specifically, Vroegindewey and Hodbod (2018) said that the agricultural value chain system had two (2) layers:

“The first layer, which we will call value chain “components,” are the stocks of resources that farms and agribusiness firms (e.g., processors, traders, and retailers) use to produce and trade. A firm’s resources include its physical, financial, and human capital, as well as the capabilities to carry out complex productive and operational tasks. The second layer comprises the institutions that govern the use and flow of resources and coordinate these activities across the value chain. This second layer includes horizontal coordination structures that govern the interaction of businesses within a given value chain segment, such as farmer organizations. It also includes vertical coordination structures that govern the interactions of businesses across segments, such as bilateral contracts between businesses, and even broader structures that coordinate multiple nodes in a chain, such as value chain participant councils or commodity associations.”

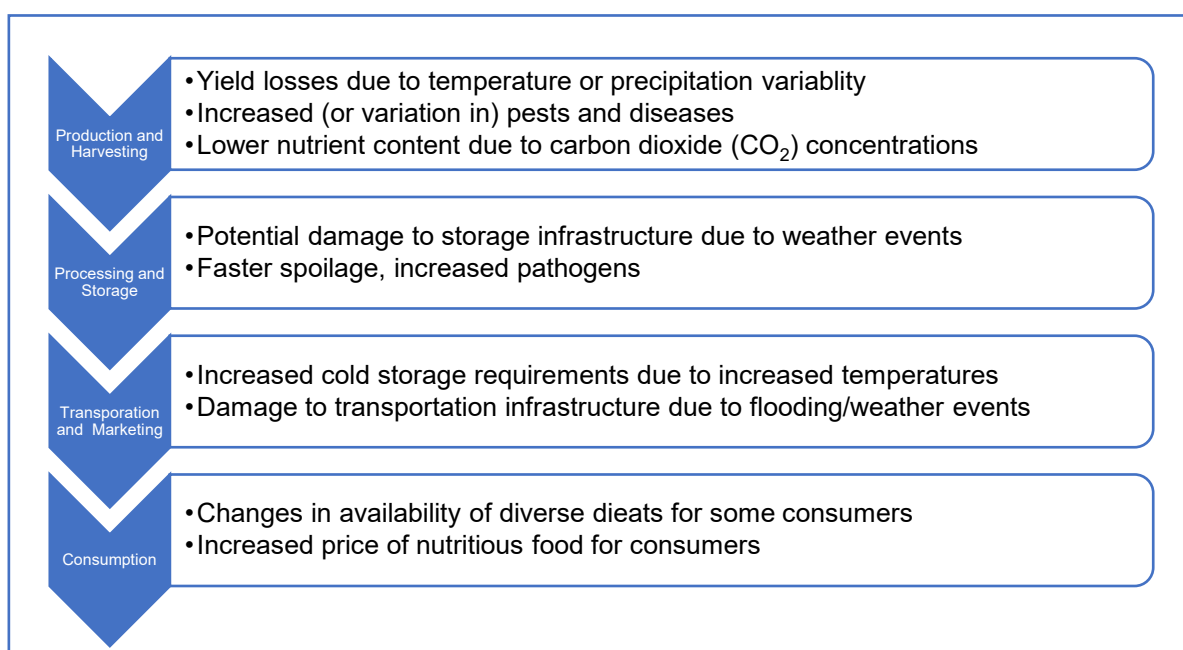
Allen et al. (2016) and FAO (2018) added that the agricultural value chains could provide a framework in describing all actors and activities in the food system, and how value is created and captured by all stakeholders. With agricultural production, diversity of food supply, and food affordability as food system’s dimensions, the analysis could show which segments in the chain could be improved to consider and reach even nutritional outcomes and environmental impacts. One example is the rice post-production system at the postharvest stage that would improve efficiency through reduction of postharvest losses, enhance the quality of milled rice and distribution system, and maximize rice by-products. However, the value chain approach usually concentrates in one commodity and may likely ignore its relationship with the other commodities.

To maximize welfare as well, farmers might be engaged in multi-cropping and other agriculture-related activities, while consumers spend on a bundle of goods and services. “Achieving broad-based developmental impacts, thus, requires taking a broader look at the interactions of all food value chains at the food system level” (FAO, 2018).

### **Climate-Smart Value Chains in Smallholder Agriculture**

Climate change endangered long-term benefits of agricultural value chain that aimed to reduce poverty and improve livelihoods of small farmers (Vermeulen and Dinesh, 2016). The study of Mwongera et al. (2019) also showed that climate hazards already negatively influenced all activities along the chain. The impacts, however, vary by commodity and by stage of the chain, and therefore require different approaches in adaptation. Figure 3.4 shows the potential climate related impacts to food value chains. According to Allen and de Brauw (2019), the exposure and vulnerability of the value chain activities to climate change could make interventions more expensive.

**Figure 3.4: Potential Climate-Related Impacts on Food Value Chains**



Source: Allen and de Brauw (2019)

To ensure that the identified activities and interventions in the value chain are resilient to climate change risks, it might be practical to simplify and make the value chain “climate-smart” following these steps (IFAD 2015):

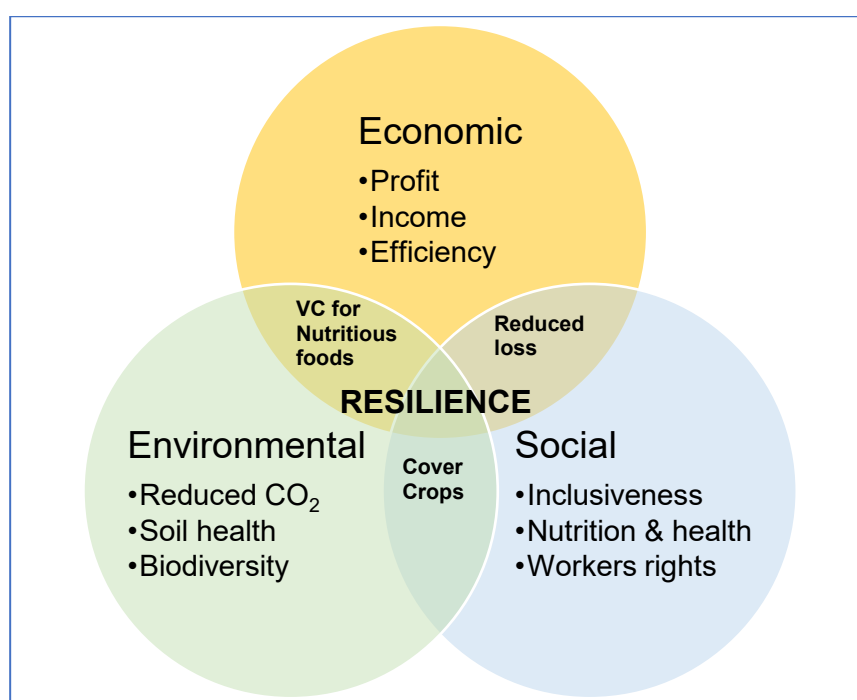
1. Select the value chain.
2. Identify key climate risks in the value chain.
3. Choose the most effective climate interventions.
4. Target those most vulnerable to climate risk.
5. Reach scale with climate interventions.

These five steps may be sequential or undertaken in parallel depending on the approach taken (IFAD, 2015). Furthermore, Vroegindewey and Hodbod (2018) mentioned that there are three (3) crucial questions to ask when applying resiliency-building principles in an agricultural value chain. These are: (1) the level of resilience suitable for a given value chain; (2) unique

capability in adopting resiliency to improve the marginal welfare of consumers; and (3) reduction in transaction costs and risks of opportunism by enabling the value chain to prepare for uncertainty and mitigate impacts.

Finally, to develop a sustainable value chain within a food systems framework, FAO (2018) proposed to simultaneously consider three dimensions (economic, social, and environmental) and generate positive values among them. Figure shows the relationship between the three dimensions, as illustrated by Allen and de Brauw (2019). Its overall performance, measured in terms of sustainability, was the result of the interconnected actions of all stakeholders in the food system. A sustainable food system, as a growth driver, should create added value that had five components: (1) salaries to workers; (2) a return on assets (profits) to entrepreneurs and asset owners; (3) tax revenues to the government; (4) benefits to consumers; and (5) impacts on the socio-cultural and natural environment (FAO, 2018).

**Figure 3.5: Trade-offs and Synergies for Sustainable Food Value Chain Development**



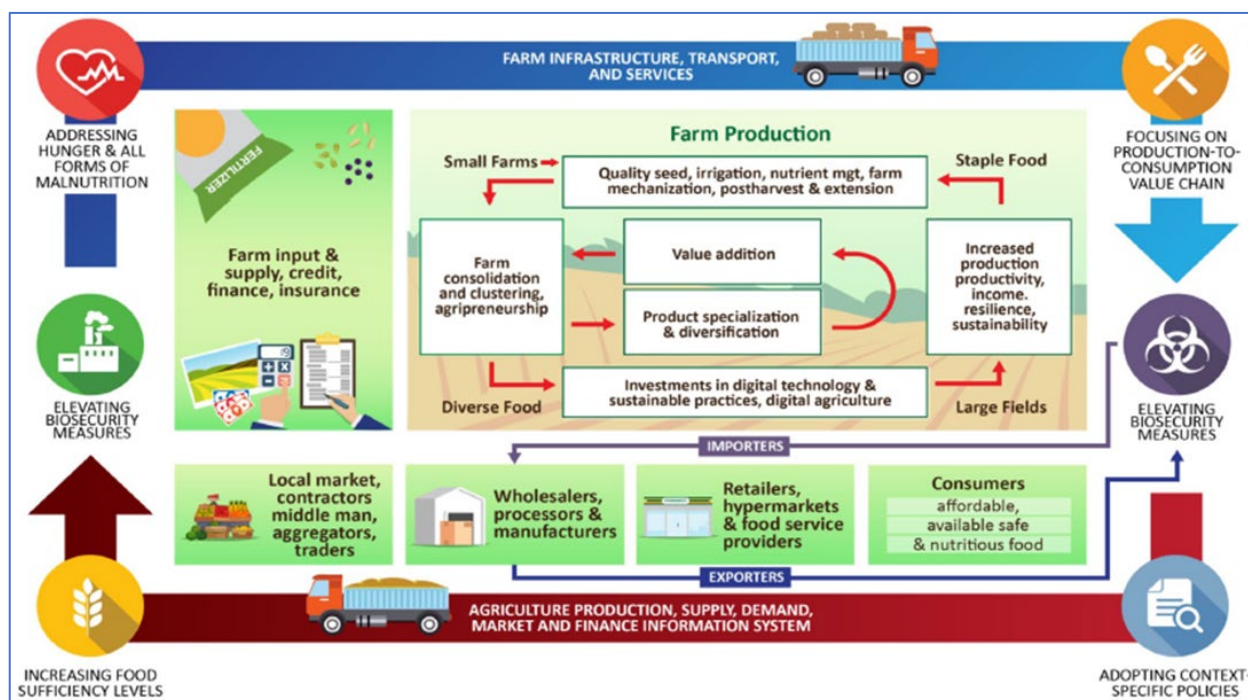
Source: Allen and de Brauw (2019) adopted from FAO

### Transformative Adaptation of Agri-Food System

We propose a food systems approach, that is, a whole-of-system perspective that also includes possible synergies with environmental factors, human health, and animal health. The food system approach, as shown in Figure 3.6, opens up more opportunities for access to resources, and incorporates the OneDA key strategies related to agribusiness and market development services. At least four of the 18 OneDA strategies explicitly contribute to modernizing and industrializing agribusiness and agripreneurship: agri-fishery industrial business corridors (AFIBCs) with fisheries management areas and trading posts; global trade, export development, and promotion; education and training on agribusiness management; postharvest, processing, logistics, and marketing support; and private sector mobilization services.



Figure 3.6: Philippine Food System: Toward a Healthier People, Healthier Economy, Healthier Planet (DA, 2021)



This transformative adaptation of the food system approach aims to use a climate-resilient and agro-industrialized value chain analysis where key stakeholders can work together in real time to solve problems that stifle the movement of food commodities from the suppliers to consumers—shortening chains by removing intermediaries in the supply chain, selling to local markets and e-commerce platforms, or choosing logistical routes that provide low travel and/or paths of least sociopolitical resistance. During the pandemic when mobility restrictions were implemented, digitalization and e-commerce platforms for logistics, marketing, payments, and credit in the different stages of the value chain helped address challenges of farmers in procuring inputs, and provided the processors, wholesalers, traders, and other key players in the supply chain the capacity to deliver goods and services to changing demands and purchasing behaviors of consumers (Figure 3.7).

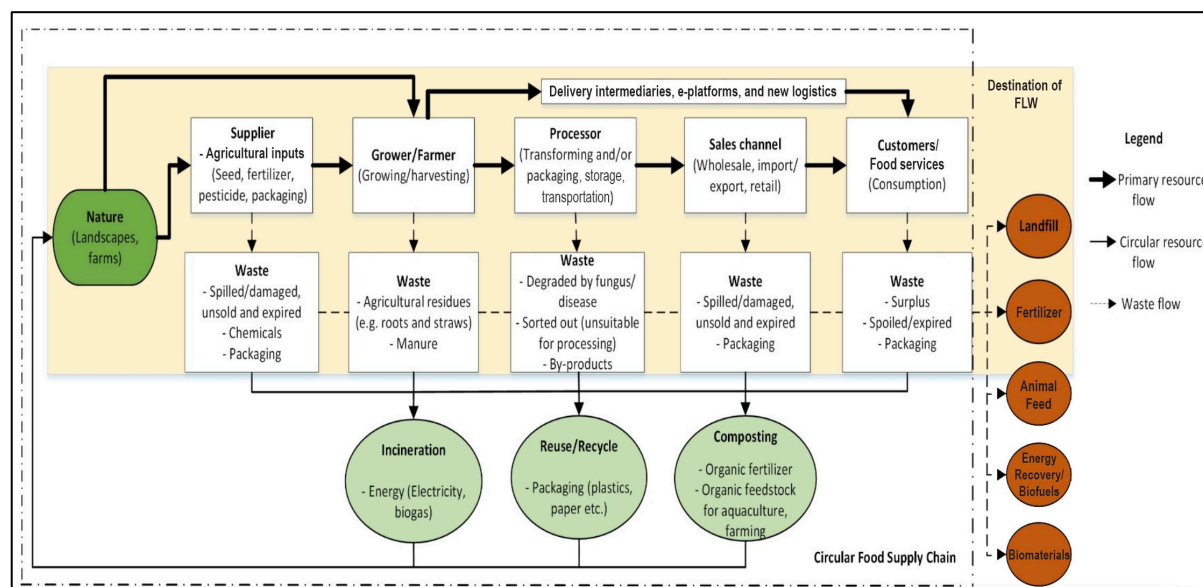
We also pay attention to localizing the food system value chains to improve the resilience of commodity systems and food value chains against shocks that have disruptive and harmful effects. During the COVID-19 pandemic, the DA encouraged household food production to address the weaknesses and vulnerabilities of the volatility in food chains due to lockdowns and quarantines. Localizing food systems could shorten food value chains, and promote better food and nutrition security outcomes. With the pandemic, came an increase in purchases of more nutritious but more expensive food in response to health concerns (in addition to the high increase in transaction volume through online retail). The opportunity to link farm communities with co-located food industries and consumers can help farmers in marketing their produce, and improve synergies between the supply and demand sides of the commodity chains.

The transformative value chain shown in Figure 3.7 also suggests developing reverse logistics networks along the supply chain, wherein consumers are not the final link of the value chain because they play an active part in the recovery of food losses and recycling of wastes. For a value chain to be sustainable, managing the flow of reverse logistics in commodity systems is important especially in reducing food wastes and losses. This would mean converting wastes

of the value chain into material or energy for reuse, and preventing wastes from polluting our soils and waters that threaten the sustainability of our food system.

These commodity systems innovation along the value chain have to be supported with infrastructures, ICT technology and network, and regulations for market integration that would lower transaction costs and thus enhance resilience to supply chain disruptions. This support from the government would facilitate the innovation of commodity value chains, and contribute to transforming them into climate-resilient and industrialized commodity system value chains.

**Figure 3.7: Transformative Adaptation of Commodity System-Based Value Chains**



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## CHAPTER 4

### Infrastructure and Logistics Services in the Agri-Fisheries Sector<sup>13</sup>

**F**ood supply chain ideally covers all the processes relating to how food is produced or cultivated from the farms or production areas until it arrives to the table in the consumption areas. This includes the manufacturing, administration, utilization, and discarding of food items.

This whole process of moving food from producers to consumers involves financial resources to pay for the cost of items, the packaging, marketing, distribution and the wages of the individuals working at different stages of the chain. In every part of the operation, man-made resources and raw materials are required to ensure the successful productive flow. It is important to understand that supply chain generally affects every other stage of the operation, so it is vital to streamline the entire process to avoid efficiency and high operational costs.

Stages of the food supply chain include production, processing, distribution, retail, and consumption:

1. **Production.** This is where the ingredients, meat, fruits vegetables, food, and beverages originate and are purchased from (either animals or plants).
2. **Processing.** At this stage, all the plant or animal-based raw materials are converted into edible consumable form.
3. **Distribution.** Once converted into edible form, the final food products are transported and distributed to the necessary retailer or supplier. Distributors sell the items, manage inventories, reduce costs, and do other actions to add value to the food products. In certain products, the complexity of production may require a number of distributors especially if the products are made from very distant places like overseas or across continents.
4. **Retail** is the means to deliver the products locally to the consumers. It covers everything from obtaining the products from the distributors to selling them directly or indirectly to the final consumers. As explained, retailers may also vary at certain levels from country, region, province, city, and community depending on the distance of production and consumption areas. Retailers may vary from food terminals, supermarkets, convenience stores, small *sari-sari* stores and online transactions, which have become increasingly popular with advances in information and communication technology (ICT).
5. **Consumption.** This simply involves the actual purchase of the food products by the consumers from the last chain of retailer being the last stage of the chain.

#### Factors Affecting Supply Chain

The whole supply chain industry faces various factors that affect its steady flow wherein disruption causes shortage, increased retail costs, and inefficiencies in the consumer market. The **usual factors that affect the food supply** are as follows:

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<sup>13</sup> Prepared by Manuel Jose D. Camagay, Agriculture and Food Supply Chain Specialist, FAO

1. **Weather.** Long dry season as well as long rainy season can directly impact agricultural products like fruits or vegetables but also include livestock, cattle, swine, and other meat products.
2. **Natural disasters.** Severe weather and unusual disruptions in nature like typhoons, flooding, droughts, winter storms, hurricanes, tornadoes, earthquakes, tsunamis, volcanic eruptions and all other natural disturbances can directly impede food supply chain.
3. **Governance.** The governing capacity of leaders can make or break the fate the any jurisdiction or populace. A leader without an envisioned future for his constituents cannot expect a sustainable tomorrow especially in terms of food security. The inability of food production amidst rich environmental resource is a sign of poor management. Likewise, the incapacity to control the market prices for basic survival needs other than food is an indication of weakness to balance the general interests of the people. Sustaining the availability, accessibility and affordability of food should be the ideal goal for all leaders.
4. **Economic instability.** Market prices and commercial operations combined with weather disturbances can have an impact on the economy at the local, regional and national levels. In some cases, government support may be needed to provide stimulus assistance to address the instability on a wider scope.
5. **Trade barriers.** Sometimes trade policies change even within a city or country depending on the governing administrations. Trade policies require harmonization and alignment in order to fully conduct the actual trade in terms of commodities that are either scarce or abundant between the trading entities locally or internationally.
6. **Insurgency.** Whether political, economic or even as acts of terrorism, insurgencies can easily disrupt the food supply chain. The recent military takeover of the leadership in Myanmar has caused multinational businesses to pull out their investments and relocate or regionalize their commercial operations elsewhere. Generally, wars or armed conflicts automatically “press the stop button” for all commercial operations and the consumers are left with limited options in services.
7. **Epidemics and outbreaks.** Relative to magnitude, an epidemic literally means impending health risks for everyone. Various cases have occurred in history with substantial fatalities and damage to the economy. In the last three decades starting 1990s, several viruses have caused plagues and deaths among humans and animals. The world has not completely recovered from the impacts of the COVID-19 pandemic especially for countries with poor social services. This means that the people will have limited mobility, access, and productivity due to the risks associated with the virus. The supply chain has been greatly affected by the pandemic and still continues to take a toll on many sectors. The reason why supply chain, in general, is able to withstand the effects of the pandemic is because additional investments are being poured in to cover the additional costs of health and safety protocols, series of continuous testing, additional personal protective equipment, development of monitoring systems, and contact-less spot checks. The impact is projected to last until the next two to three years if properly contained. Meanwhile, random outbreaks are bound to happen when the protocols are neglected.
8. **Transport and logistics disruptions.** Apart from weather disturbances and natural disasters, interference occurs at various levels. A collapsed bridge, power outage, forest fires, local emergencies, feudal groups in production areas, etc. can disrupt the flow of trade not only in food. In many cases, the disruptions in transport and logistics are after-effects of the first seven factors mentioned above.

Still, a number of cases, purely transport and logistics in nature, relate to disruptions. The week-long traffic choke of the Suez Canal in March 2021 caused by a large Taiwan-based cargo ship resulted in an estimated USD400 million loss in global trade and the price of oil rose. Companies were troubled with more than a hundred cargo ships stuck with

consumables, perishables, and other non-food products experiencing delays or getting spoiled before reaching the retailers and consumers.

Similarly, in the local or regional setting, there are passages by water and land that are prone to clog in the same way, like the recent Suez Canal incident. These should be seriously considered. Some farm-to-market roads can get easily blocked when traffic becomes unusually heavy within or near the whole stretch of the road. Border controls in the waters for sea cargoes are prone to hijacking by pirates due to the nature of the sea passage lacking security in open waters.

## The Pre-COVID-19 Period

### *The importance of Supply Chain*

Supply chain facilitates access to basic needs as well as less important commodities. From the whole supply chain process, business, livelihood, and employment are created and directly contribute to the economy across territories and shorelines. A fully established supply chain can empower even the smallholder farmers or fishers to market their products to far distant shores for retailer and consumers to enjoy. Supply chain is basically expanding the reach of producers to meet the market demand.

Retailers like stores, shops, restaurants or even manufacturers aspire to deliver quality products at an affordable price to attract consumers and still protect the profit margin and continue to efficiently operate the business. In order to maintain a good steady supply chain, all the players—producers, food processors, distributors, retailers and consumers—should be satisfied with what they work or pay for. On this standpoint, close monitoring of the supply chain is essential to be able to see the whole chain and where breaking may occur to cause disruptions. Inefficiency in the supply chain results to increased prices of and decreased access of the commodities. Experts estimate that around 30% of food loss and wastage occur during the supply chain process from production to consumption, and this translates into impacts on food security, the economy, and sustainability. Food quality that has deteriorated upon reaching the market can either be sold at a much lower price or dumped away, since they are not fit for consumption. These realities truly affect the livelihood and well-being of farmers and fishers.

The Suez Canal incident taught the industry to learn and be wary of unforeseen situations that can paralyze the supply chain and translate into huge losses financially and materially through wastage of consumable products. Months after the full stop of trade flow in the canal causing supply chain shocks around the world, the ripple effects were still felt in various areas by many industry players. According to supply chain professionals, it may take about 60 to 90 days for the whole industry to reset itself in order to attain its normal functional state. This is true to industry players operating on smaller revolving funds to move their goods across seaports and borders.

The same scenario happens to the local supply chain systems when delivery of goods to the end users is hampered or even result to failure due to spoilage caused by delays. The magnitude of financing and operations in the local setting involving farmers and fishers is much less, but the impacts can be huge on their small-scale production design schemes. This affects the market, the consumer preferences, the consumption patterns, and ultimately, the local economy.

The government or authorities can set management or regulatory policy instruments to be able to control the quality especially human consumable commodities. Proper policies can help mitigate food losses and wastage. This needs a good oversight of the supply chain to ensure the safety, condition and palatability of items traded even overseas. The core purpose



of food regulatory policies is to ensure consumer protection by meeting health and safety regulation standards. Absence or failure of stringent food regulatory policies can greatly impact the supply chain with ripple effects that could be too difficult to curb over a period of time.

### ***Advancement, Access, and Connectivity***

Supply chain processes are evolving with technology as the ever-growing consumers' demand has been increasing in the last three decades, when trade barriers have gradually opened even in the international market. Along with this, the advancement of information technology slowly became integrated with mobile technologies and digital communication developments.

Traditional supply chain processes heavily involve physical presence of agents transacting in the production or harvest fields as well as trading areas in fish ports. Once agreements are forged, products and commodities will either find their way into the food terminal hubs for wholesale and distribution or be contracted by consumer item manufacturers for processing into food products with longer shelf life thereby avoiding spoilage.

The perennial advancement of information technology paved the way to continuous innovation until the digital connectivity was perfected using mobile telecommunication aided by the internet. The massive flow of online resources further advanced careers in computers and information technology and generated new generations of software, hardware, and mobile application developers.

All these developments have significantly improved the supply chain on the logistics side. The evolution was largely initiated by the cargo handlers and forwarders as part of their operations to simplify transactions and reduce the field personnel and documentary requirements that sometimes get lost during transit time.

Moreover, the rapid development of mobile devices from simple analog to smart phone, tablets, laptops, and various gadgets including smart watch can allow transactions and real-time monitoring of business activities.

As expected, the mobile communications and digital connectivity will continuously advance into simple formats but with a more complex digital infrastructure. The benefits of convenient communication, online meetings, virtual gatherings, as well as real-time viewing of the production areas are attributed to technological developments. Along these advancements, the supply chain processes are also undergoing simplification as part of the logical treatment of technology management.

### ***Problems in the Food Supply Chain***

Despite the progressive developments in the industry, the food supply chain generally faces some uncertainties as explained by these underlying reasons.

1. ***Effects of climate change.*** Over the years of awareness on the reality of climate change, citizens across the planet are slowly witnessing the impacts. The abnormal changes of seasons, the droughts, flooding, and unusual rise in sea levels are all effects brought by climate change. As the agriculture and fisheries sectors are dependent on the seasons that dictates the planting and harvesting periods, the timing has gradually become distorted. For food manufacturing plants, the inventory of raw materials will be a problem when the main ingredients, be it plant or animal-based products, are not readily available. For small producers with no factories and overhead costs, the impacts may be less especially if the raw ingredients are locally cultivated in the farms or fished from the open seas.

2. **Loss of agricultural lands and reduced fishing territories.** The realty developments since the 1990s for modern urban housing or commercial shopping malls became a catalyst for land conversion. With the increased demand for better settlements and capacity to pay, the housing market became a mainstream investment consideration for families especially those with no properties of their own. The negative impact of this scenario is when agricultural lands are also developed into settlements, work, and entertainment areas. The effect of converting agricultural lands for other uses is irreversible as the soil loses fertility and can never go back to its original state. Farmlands have diminished in the recent years not only because of natural causes but by deliberate human intervention to cater to the interest of businesses and investors.

On the other hand, major territorial waters that had been utilized for fishing for many generations have been occupied by a neighboring country thereby restricting local fishermen from benefitting from their own waters. Even before the militarization build-up in the West Philippine Sea in the recent years, the seas around the Philippine archipelago have been encroached by foreign fishing companies because of their richness in sea products. This happens due to lack of border patrolling capacity around the whole archipelago to secure the resources and interests of the country.

3. **The emergence of “farm factories.”** The age of high mass consumption and big volume production trailblazed the farm factory business model that eventually evolved into monopoly in some countries where it can be replicated in the Philippines. This evolution compromised traditional methods of farming, agriculture, and manufacturing with less sanitation and application of chemical treatments leaving side effects to be felt in the days to come. The new goal became cheaper food and products regardless of how they are produced. Quality became a luxury which leaves the consumers to shift to practical choice.

The lockdown somehow resulted in reduced dependency on preserved packed foods and fast foods and has driven many families to return to home cooking with so much time together at home. Can we say that we have healthier food on the table due to the outbreak? This is a good time for families to learn traditional, healthier, old-fashion cooking.

This critical transition to ready-to-eat, food-to-go meals paved the way for **farm factories** that produced chemical-laden food so it can be ready for consumption way earlier than the normal growth process. The chemical boosters that include antibiotics and artificial flesh or meat builders are transmitted to the consumers that somehow affect their own body chemistry including the immune system. In order to meet the high demand, alterations in farm animal raising or fruit and vegetable farming business became a necessity to farm factory corporations. This practice pollutes the natural waterways that find their way into the water table or to oceans and affect the freshwater animals up to the whole marine life. The traditional clean and safe farm animal raising and plant farming methods have become a luxury and unprofitable (Camagay, 2020).

The negative effects of farm factories, nevertheless, is mostly felt in animal raising especially when they excrete their body wastes that, at times, mix with the feeds they eat or cling and dry up on their skins before slaughter. For indoor farming, the practice is much safer as the plants mostly need only water and sunlight. These elements can be readily provided, with sunlight replaced by artificial lighting from LED lamps with customizable wattage to control the amount of heat and light needed by the plant varieties.

Some countries have perfected the art of indoor farming by combining proper nutrition, engineering and technology. In advanced economies, the problem on the limitations of agricultural lands have been resolved by vertical indoor farming using both natural and artificial ventilations and lighting. The results proved to be better than some produce, because the risk of pestilence and damages by weather disruptions is completely eliminated. The operation yielded good results due to efficiency and higher productivity.



3. ***Inadequate supply chain infrastructure.*** Although the Philippines has already adapted to the supply chain system, there is still dire necessity to provide a real supply chain infrastructure to expedite the flow of goods across the whole country. With its unique geographic make-up of 7,107 islands, the challenge of systematizing and streamlining smooth-flowing supply remains high. So far, the most obvious solution taken by the government is to dedicate truck lanes in Metro Manila, being the central nerve of logistical operations, in order to expedite passage. However, this solution eases up more of the private individual's vehicle traffic flow and not necessarily focused on supply chain. In most cases, supply chain solutions are devised by the private sector in order to minimize the impact of slow movements of goods. The only problem with private sector-led solutions is that the scope is not widescale simply because they are not regulatory agency units but are rather industry players, which at times lead to fragmented supply chain scenarios.

To be able to orchestrate a good widescale supply chain management, a master plan may be developed both by the government and the private sector where the industry players can actively take part by providing their operational information as inputs to designing the ideal master plan.

4. ***Conflicting and outdated regulations.*** The significance of regulations directly pertains to the quality and state of the goods, especially perishables, at the same time protecting the welfare of the food supply chain workers. Responsive regulations or laws include tariff, inspection protocols, and traffic across all transport modes. Big delays would be detrimental to perishables, compromise the preparations for a banquet or gatherings, and ultimately, can spoil perishable produce, raw meat, or sea food if not well-prepared for long transit durations. At some point, the losses will translate to additional cost that shall be borne by the end-user in order for the whole supply chain system to survive. These can affect the profitability, the value of investments, and paid labor that will make the whole business operations unsustainable.

Delays reduce productivity, because not all the producers, be they farmers or fishers, have the means to haul their goods in bulk.

They rely on contract haulers especially for long trips. Having additional entities in the supply chain and logistics can complicate the transactions, especially when regulations cause problems and inconvenience. A review of the policies that can affect or even improve the supply chain and logistics would be a good way to start revitalizing the industry. Streamlining these regulations into a simpler, less-redundant overall scheme may address bottlenecks and improve the system.

5. ***Fraud and dishonesty.*** Apart from spoilage due to unforeseen delays, fraudulence and dishonesty also occur in the supply chain industry. These have been reported several times across transactions and hurt the industry. As fraudulence and dishonesty increases, regulations should be imposed to counter the malpractices. The more serious impacts of these malpractices include food poisoning, a ruined reputation, or even death. These ripple broadly to the whole industry putting all other players on the spotlight of distrust and anomaly. Additionally, there is leniency on the source of food products. This is important especially in times of pandemic wherein contaminations are part of the monitoring. Proper labeling of food product sources can provide convenience in traceability and confidence to the clients, retailers and consumers.
6. ***Business as usual.*** In spite of the several factors as well as the identified major problems clouding the food supply chain, the industry is firmly on its feet surviving huge challenges especially during the pandemic period. In other words, the food supply chain is resilient simply because food is the most basic need for human survival at all times.

The imperfections in the food supply chain do exist as presented in the previous sections wherein some can be addressed at the local community levels while others need certain

legislative actions across agencies. To curb these imperfections, the industry players act upon themselves to resolve the issues until a really good supply chain and logistics scheme is in place, which may not absolutely be the final solution given the changing conditions across regimes, policies, and in the food production sector.

The outbreak of COVID-19 that was felt globally in the first quarter of 2020 created an enormous impact not only on the food supply chain but also across all other industries. Still, with the pandemic unresolved and continuing to take tolls on human life with random outbreaks across the world, food production and supply carry on with their imperfections and problems even at higher operating costs and fragile situation.

Although business as usual would be the ideal description of the standard consumers-pay-producers basic trade practice, there are now some twists in the acquisition of goods, especially food, in this period of global health crisis. This shall be discussed in relation to the condition of food supply chain in the next section.

## COVID-19 Period

### ***COVID-19 Impacts on Food Supply Chain***

When COVID-19 became a serious threat to humanity, the most basic need had been compromised. Consumers from all walks of life scrambled for groceries and started emptying supermarket shelves at the start of lockdown. As the pandemic period stretched into months, the food supply started to catch up with the demand and eliminated panic. However, with the health and safety protocols imposed on all public establishments, all consumers and retailers experienced inconvenience.

At the side of food production, like farms and fish ports, a similar situation happened but with less pressure on the protocols due to more open spaces. Still, workers need to observe standard operating procedures<sup>14</sup> on a regular basis each time they are in the workplace or in any public area.

The two direct key impacts of the coronavirus on the food supply chain are the inclusion of health and safety protocols and the additional cost on all operations, which relatively increase the prices of commodities. These two impacts affect everyone regardless of whether one is consumer, producer, distributor, wholesaler, or retailer.

However, after an initial round of panic-induced buying and business opportunities that resulted to price increases, the awareness of possible home-based businesses led to local adaptation in many communities. The emergence of multiple online entrepreneurs using the social media or established web-based marketing platforms allowed netizens to sell all types of commodities especially food and personal needs at lower rates and more direct transactions. The quarantines spawned new retail format through online communication that started with unstable prices being an emerging system for commerce but stabilized over a few months when patronage increased.

### ***Disruption, Food Security, and Opportunities in the Supply Chain***

Obvious disruption of food supply had been witnessed in the initial lockdown periods. The pandemic has increased some food costs due to safety concerns and stringent security measures required for workers during food production, processing, distribution, and retailing stages of the supply chain. This was evidently noted when the lockdown was imposed as

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<sup>14</sup>Wearing of personal protective equipment, frequent washing of hands, use of sanitizers, regular bathing, regular temperature check at every entrance of a facility, and periodic swab tests.

supermarkets were almost emptied due to panic. The sudden surge in consumer products rippled into other different negative impacts that caused other players to capitalize on the situation.

The real risk on food security is not directly associated with the supply chain but more on the overwhelming effects of COVID-19 relating to jobs and livelihood. When skilled workers in the production areas are gone, productivity is compromised. In other words, the impact of COVID-19 is higher on food production along with actual workers and the ripple effects on the network of supply chain that makes up the whole system to make it work like a concerted effort of many players. If the social safety nets are not well in place like in developing economies, the crisis may lead to a spike in poverty and hunger. The World Food Programme projected that the number of people in acute food insecurity could double to 265 million in 2020 unless swift action was taken (OECD, 2020).

1. **Production bottlenecks.** Undeniably, bottlenecks have been experienced in agricultural farms concerning labor. While some sectors are more dependent on seasonal workers especially for fruits and vegetables being more labor intensive than grains and oilseeds, the problem arises with farm workers' limited mobility options during planting and harvesting. In many areas, low-cost and affordable public transport operations were put on hold to control the spread of the virus. In the process, many average wage earners, not just in the agricultural sector, have been limited from traveling or even lost employment in some areas. As far as farming is concerned, the resources needed, like seeds and fertilizers, are not much of a setback. The seed sector is highly globalized even before the COVID-19 crisis and can be traded in time for planting season in or before the end of summer in most Asian countries.

Even during the pandemic, seeds were not a serious problem. Fertilizers were not much disrupted except in the logistics side with stricter quarantine and border controls, given they are transported in bulk unlike seeds.

Despite modern initiatives to do away with pesticide and fertilizers to come out with organic and healthier farm produce, many farmers still embrace and remain dependent on pesticides for higher yield to maximize income. The lockdowns simply disrupted the importations with majority of pesticides coming from China, where the virus was reported to have originated. Other sources are also scrambling for faster deliveries to clients in time for the season because of the general disruption of trade and commerce.

2. **Disruption in food processing.** Processing plants, even in the food industry, follow sequential tasks that require lines of skilled people working on specific tasks to complete the final product. The health and safety protocols have altered all this "assembly line" approach especially with physical distancing. In addition, manpower was considerably reduced and aside from skeleton workforce, the limitations and difficulty of traveling to work has become burdensome. Protocol enforcements became too restrictive to food processors, forcing some to suspend operations, and in some cases, consider closure to avoid more losses.

From the fishers and farmers' end arose a number of complications when the pandemic set in. Financing institutions observed reduced operating days if not closure, thereby affecting the fluidity of resources for food production. The trade market that normally generates the income for farmers and fishers has come close to being stagnant due to the virus scare along with the imposed stringent regulations by the local government units. Quarantine periods were imposed resulting to lockdowns that curtailed movements of people dependent on public transport services across all modes, not just road. The public (land) transport, which was before operationally viable at full capacity, was barred from operation due to the nature of its operation where people are confined in an enclosed space that runs contrary to the physical distancing protocols. This situation prevented

drivers and operators to lose their livelihood for almost a year, while payables accumulate for those who have modernized their jeepneys as part of the government program.

The sectors that are not negatively affected by COVID-19 are the health care services, food and medicine, security, peace and order, communication, logistics, and of course food production, which are all considered essential frontline services to address the needs in the pandemic. Within three to four months after the first phase of lockdown<sup>15</sup> the food supply chain started to normalize but remains far from the pre-pandemic levels. At this point, prices are slowly increasing yet inconsistently due to government interventions.

Policies to secure basic needs, especially food, was addressed by the Department of Agriculture and Department of Trade and Industry to facilitate the flow of goods. Input and credit support from the government were affirmed as helpful to the farmers, while the *Kadiwa ni Ani at Kita* program of the national government, together with procurement for relief goods of LGUs, provided a strong demand boost to fruit and vegetable farmers.<sup>16</sup>

Across various sectors, workers were displaced due to the nature of the business operations they belong to. All businesses relating to travel and tourism, malls and retail market, big crowd and sports events, and even schools and churches are barred from operation to control further spread of the virus. In essence, lay-off across these types of business operations was massive and easily increased the unemployment rate. Some processing plants were forced to shut down because of infected workers, leading to increased inefficiencies and costs.

Given the large pool of skilled and capable unemployed people, the job market became a choice on whether to be an employee or to become self-employed, the latter leading to being an employer when and if the venture becomes successful in the future. However, the layoffs also reduced the production rate and compromised the outputs, affecting the flow of goods especially food and other consumables. The situation created an open market for producers of less popular brands or small companies with ample inventories to share in the food supply chain. Simply, there will be winners, losers and in-betweens.

3. **Market and industry transformation.** The present situation that resulted from the outbreak of coronavirus served as an acid test for all leaders and defined the resiliency of humanity. It is clear that the global economy has been hit like never before, causing an urgent need for the market to transform in order to endure the crisis and beyond complete eradication of COVID-19.

## Five Overarching Scenarios in Market and Industry Transformation

Assessing the present condition gives us five scenarios governing the situation and these may completely cover the totality of the impacts and unexpected benefits of COVID-19.

1. **Winners.** There will surely be winners in any crisis, which relates to survival. It is easy to see this based on the list presented. These are things that the world cannot do without. These are basic needs, medicine, shelter, e-commerce, family home life, and news and public affairs. *The driving factor is consumerism.*
2. **Emerging markets.** It may be unintended, but it is by chance or even by default that unexpected twists will prove to be logical and useful in the period of a crisis. These include simple living (choosing the cheaper yet useful and practical options), electric vehicles,

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<sup>15</sup>The first declaration of lockdown in response to COVID-19 was on 17 March 2020 starting from Metro Manila until it gradually spread into other key cities in the Philippines.

<sup>16</sup>Rapid assessment of the impact of COVID-19 on food supply chains in the Philippines, Food and Agriculture Organization

alternative power/energy, remote work, recycling practices, and home-based business. *The driving factor is **sustainability**.*

3. **Middle grounds.** At some point in any widespread crisis like COVID-19, there will be realizations of helpful lessons that may challenge the way we do things. These are office spaces and daily reporting, construction development projects, overseas contract jobs, fossil fuel, crisis volunteers, and the like. *The driving factor is **uncertainty**.*
4. **Losers.** Surely, this is reciprocal to winners. This is a natural phenomenon when two ideologies collide where one prevails. The COVID-19 crisis helped us visualize the magnitude of impact it has created and there is no definite timeline nor endpoint. Affected are travel and tourism, mall and retail industry, big crowd entertainments, sports events, conferences and exhibits, public gatherings (luxury vs. practicality), and employment (resulting to massive unemployment). *The driving factors are **pleasure and leisure**.*
5. **Transcendents.**<sup>17</sup> In any crisis, certain areas will not be affected by the situation because they are necessities that counter the impacts of the crisis or simply because they are crisis-proof and will naturally remain as such with minor adjustments. These are the healthcare services, personal protection, human interaction, education, commerce and trade, telecommunications, transportation, supply chain and logistics, environment, and the natural world. *The driving factor is **borderless adaptation**.*

## Adapting to the Transformations

COVID-19 literally transformed the dining culture in the booming food and restaurant business into take-away and food delivery options taking out all the classic and special feel of dining experience. While the food industry contributes a significant share in the overall economy, the cost implications on the industry players have gone irrational when no one visits the restaurants to eat to avoid the risks. This major shift has rendered the high-investments and high-value eating places with good amenities and decorations into empty spaces that were simply reduced to kitchen and food-packing establishments. These same scenarios happened in hotels, bars, music lounges, and all public spaces offering food, drinks, and entertainment.

Many offices have come to realize that they do not actually need office space when all the work needed can be performed using computers, a good online connection, a few office materials, and a dynamic remote management work plan. Many companies are experiencing big savings in lease or rental fees, electricity, telephone bills, utility, and shuttle service expense for some companies. Many office-based firms have adapted to the remote work arrangements and are considering downsizing their manpower even when the pandemic would have been eliminated.

What used to be just an option to have a formal education, distance learning has now become the mainstream platform for the education authorities, now rebranded as online learning. Even before the COVID-19 crisis, many people from developed economies have subscribed to online learning in order to choose only the course and interests that suit them and focus on particular specializations. Unlike formal online education, no degree or diploma comes with it, and it usually just provides a certificate.

In the last five years, the threat of online selling had been noted by the retail industry. The pandemic has simply mainstreamed online shopping and significantly reduced physical visits to the shopping malls, leaving small shops and small start-ups out of business. Along the process, the emergence of door-to-door delivery service providers has further strengthened online transactions even if many consumers still prefer traditional shopping.

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<sup>17</sup>Transcendent as an adjective means beyond or above the range of normal or merely physical human experience; surpassing the ordinary; or exceptional.



But despite all these transformations, human needs are always at the forefront and had been significantly identified among the **Winners, Emerging Markets, and Transcendent** scenarios. **Supply chain is vital to the flow of basic needs and will continue to operate in adaptive ways** regardless of the situation even with cost implications. On the other hand, **governments have a responsibility to optimize and streamline food supply chains to maintain food safety and low costs** for both the producer, distributor, marketer, retailer, and consumer. This is especially true for developing countries during crisis periods.

## The Way Forward

### 1. *Salient points of coping with the pandemic*

- a. The safest way to survive the current crisis is **smart adaptation** where leaders need to assess their own local situations, re-calibrate their business operations, and allow gradual re-opening of economic activities. Safety protocols and the minimum requirements are never to be compromised. A single breach in the protocols can potentially ignite an outbreak and repeat the tipping point of a pandemic all over again.
- b. **Governments need to adopt a dynamic response program for the current crisis** and may consider relaxing some policies and regulations to enable the supply chain and the business community to recover faster and attain pre-COVID conditions. Public spending and employment are catalysts to business recovery that may jumpstart with enabling economic packages.
- c. We have witnessed that over development has caused wildlife to lose their habitat and forced them closer to humans, which facilitated the migration of pathogens causing a deadly virus. It is now clear that **the natural order concerning wildlife must not be tampered** including captivity and living among or even consuming them. This also applies in the food supply chain wherein exotic animals may be included in the trade due to market demand. Even domesticating the wild can still carry some grave risks since not all the animals may be treated as food, considering that even the Bible specified certain species not for consumption, bats included.<sup>18</sup>
- d. This is the perfect **time for a green reboot**. The world has realized the wasteful, pollutive, impractical and unsustainable ways in most activities. There are better, safer and more efficient means that can be adapted to achieve the same results with increased productivity and sustainability.

### 2. *Future-proofing supply chain*. Among the weaknesses of the numerous plans by the government is the lack of legislation regardless of the implementing unit whether national or local governments. Any program can be repelled by the local chief executive if there is no proper legal basis on the jurisdiction and implementation arrangements since the Local Government Code can be a valid reference as point of argument. In some cases, the legislation becomes a catch-up remedy when the program or plan had already been rolled out unsuccessfully causing conflicts among implementing units and the target stakeholders.

#### a. *Infrastructure master plan*

As mentioned several times above, an infrastructure master plan is **a good approach to aligning projects and budgets from the national to local governments**. While some local governments are able to fund their own local infrastructure projects without aid from the national treasury, the need for alignment with other projects aside from infrastructure

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<sup>18</sup>Deuteronomy 14:18

is highly recommended to avoid clashing of plans and underground facilities and disruption of utilities (power, water, and communication), flow of traffic, and public safety.

The regional offices of the national government need to properly coordinate with the LGUs along with other government offices for a comprehensive plan. Since infrastructure takes time to fully realize the final result, careful planning process is needed to dynamically manage and respond to the needs of the projects.

While collaborative efforts like PPP<sup>19</sup> can significantly reduce financial burden on the government, it normally takes a longer time to realize the fruits of the partnership and may take tedious preparatory stages. However, the PPP Center has been established to address all concerns and expedite PPP project engagements.

b. **Supply chain / logistics master plan**

The Philippines should start addressing potential severe disruption of the supply chain on a national scale and come up with the plan. While NAFMIP is a national plan, **a more specific master plan is recommended for consideration to streamline the concerns of NAFMIP for food security** to get across areas and the consumers. The country had experienced shortage of commodities especially in Metro Manila in 2020 when the pandemic started. Given that the pandemic is not over yet and if the increasing infection rates and worsening conditions are not contained within the next two to three years, the supply chain will be at serious risk while more people are infected by the mutated virus.

**A supply chain master plan can help identify the possible risks** and up to what level of risks the people will be able to survive and overcome. More importantly, a master plan will draw up all the possible scenarios in supply chain process with or without pandemic, natural disasters, or any form of potential disruptions of basic needs. Additionally, it can plot the areas to improve in the overall flow, identify logistics corridors, realign cargo transport options, create more business and employment opportunities from the producers as well as markets, and attain a more efficient means in moving goods from production to consumption areas. Green logistics will be an integral part of the supply chain master plan that will apply environment-friendly processes.

3. **Foresights and insights from industry leaders**

- a. With aviation (which also includes travel, tourism, hotels and lodging, vacation spots and resorts, travel, and mobility) absorbing the hardest impact of the pandemic, the International Civil Aviation Organization has projected that the full global recovery of the industry may take place between 2023 and 2024.<sup>20</sup> Leaders across **organizations and institutions need to recalibrate their business plans and strategies** in order sustain operations and enable allied services to make their own adjustments to stay in the game. For some, **diversification may be required** if the current operations cannot sustain the needs. This applies to all business organizations regardless of the sector and the effects of the crisis.
- b. While the impacts of the pandemic on food chains continue to unfold, several lessons have emerged. **Open and predictable markets have been critical for smooth distribution of food along supply chains** and to ensure it can move to where it is needed. **Diversified sources of supply have allowed firms along the food chain to adapt rapidly** when specific input sources were compromised by transport or logistics disruptions. Finally, meeting the needs of vulnerable groups requires attention to food access, such as by ensuring targeted, flexible safety nets.<sup>21</sup>

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<sup>19</sup> Public-private partnership

<sup>20</sup> Joint World Health Organization (WHO) - International Civil Aviation Organization (ICAO) webinar event

<sup>21</sup> OECD Policy Responses to Coronavirus (COVID-19) - Food Supply Chains and COVID-19: Impacts and Policy Lessons



- c. While there have clearly been stresses and issues, overall, **food supply chains in the developed world have demonstrated remarkable robustness and resilience** in the face of COVID-19. Responses by policy makers have helped, facilitating the functioning of supply chains and avoiding the costly mistakes of the 2007-2008 food price crisis.
- d. Some **gaps in supply chain are needed to be closed**, like the (1) relative number of farmers, marketers, distributors, retailers, and consumers in order to be able to identify the possible vulnerabilities; (2) a thorough study how disasters and crises, including incidents like the Suez Canal blockage, impact the whole supply chain from the global scale down to smallest ripples at the local community levels; and (3) quantify the capacity to mobilize supplies especially food or even provide substitutes or options with the objective of preventing sickness and hunger (Davis as cited by Thomas, 2020).
- e. To address these gaps in knowledge, **key areas for future research** include: (1) understanding the shape of a supply chain, meaning its relative number of farmers, distributors, retailers, and consumers to identify possible vulnerabilities; (2) evaluating how simultaneous shocks—such as droughts in two different places—impact the whole supply chain; and (3) quantification of the ability for substitutions to occur within supply chains, like switching cornmeal for flour if there is a wheat shortage.
- f. **Building resilience on food systems is needed** to survive climate change and catastrophic events like the current global pandemic. This will enable the sector to absorb disruptions and prevent impacts spilling into other sectors and multiplying the damages along the way (OECD, 2020).
- g. It may be a long shot and will probably require a couple of years to get into the mainstream learning interest of the present generation, but who are studying supply chain except those who are currently in the trade? In order to develop expertise and be able to perfect the system to avoid the long-standing problems especially in the periodic or seasonal challenges including pandemics, **institutions should develop a curriculum specifically on supply chain** that will perfectly dovetail with transport and logistics. There is only one institution in the Philippine that offers transportation research and studies that may be able to develop the curriculum and make it as a new offering in the graduate school.<sup>22</sup>

## End Notes

Being an archipelago of 7,107 islands with no adjacent neighboring country by land, logistics in the Philippines is a challenge given the flow of goods is not fluid and requires combining transport modes. On top of this geographic profile, the number of typhoon and tropical depressions passing through the country reaches an average of 22 and at times even exceed the English alphabet being the reference for storm names. It may be deduced that “by design,” the Philippines is a calamity-prone archipelago due to its geographic location. Yet it is highly strategic for trade and transport routes and military positioning.

Two very strong typhoons hit the country in the last quarter of 2020 and forced a state of calamity in some provinces in two regions of Luzon, causing basic food supply disruption and logistics problems because of flooding and damages.

The pandemic simply added more complication to all relief operations to save lives and provide the basic needs for survival in times of disasters. Considering that the powerful storms were only weeks apart, recovery was not even halfway when another calamity struck at a different spot. The situation was like a war with three battlefronts including the COVID-19 crisis.

This unique fusion of natural factors greatly compromised the food supply chain combined with damages. Yet after the storms, the pandemic remains along with its exacerbating impacts

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<sup>22</sup>National Center for Transportation Studies, University of the Philippines Diliman

on the economy. Having survived storms and the pandemic, **the food supply chain in the Philippines can be qualified as resilient despite the challenge in transport and logistics given its dispersed islands.** This resiliency somehow managed to ensure that there will be food on the table. In July 2020, the Department of Agriculture declared that despite the COVID-19 pandemic and the imposed community quarantine since the outbreak, the Philippines continues to be food-secure with sufficient supply of basic food commodities.

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## CHAPTER 5

# Agri-Fishery Research, Technology Development, and Locally-Based Extension, Education, and Training Services<sup>23</sup>

**T**his report discusses the highlights of accomplishments of the Bureau of Agricultural Research (BAR) and the Agricultural Training Institute (ATI) of Department of Agriculture (DA) in research, technology development, and locally-based extension, education, and training services for the last 10 years. What were the lessons learned from the implementation of their plans and programs? What are the possibilities for sector transformation and what would be the possible constraints? What Research, Development, and Extension (RD&E) strategies are being implemented and planned to align with the new thinking of DA in moving forward? What possible Policies and PPAs can be adopted to exploit the potentials for sector transformation as well as GAPs in fulfilling its mandate?

### Background

BAR and ATI are the focal agencies for research and extension of the DA. Their programs, projects, and activities are anchored on the various national and sectoral policies, plans, and priorities of the Secretaries of Agriculture such as the Philippine Development Plan (2011-2015, 2016-2022), **AgriPinoy Framework and Food Staples Sufficiency Program (FSSP)** of Secretary Proceso Alcala (2011-2015), **Back-to-Basics/10-point Agenda** of Secretary Emmanuel Piñol (2016-2019), **New Thinking Strategy/Eight Paradigms** of Secretary William Dar (2019-present), and National Extension Agenda and Programs (NEAP) and Agriculture and Fisheries Extension (AFE) Strategic Plan (2011-2016, 2017-2022). The following discusses the highlights of the programs under the different administrations and their accomplishments.

### Research and Development Accomplishments: 2011-2020

This section includes a discussion on the following: (1) research and development (R&D) priorities; (2) banner programs; (3) R&D Programs; (4) services and assistance; (5) collaborations and (6) major events and activities of the Bureau of Agricultural Research.

#### *Research and Development Priorities*

For the period 2011-2013, DA had six R&D priorities, namely: (1) **Human Resource Development** Program, (2) **R&D Facilities Development** Program, (3) **Information and Communication Technology (ICT)**, (4) **Basic and Strategic Research**, (5) **Research Policy and Advocacy**, and (6) **Knowledge Management**. Thus, aside from funding and supporting R&D initiatives, part of the continuing effort of BAR as the national coordinating body for agriculture and fisheries R&D is the funding of basic and strategic research and supporting its research policy and advocacy. Also, the important complements to these R&D

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<sup>23</sup> Prepared by Roberto F. Rañola, Jr., PhD, Research, Development, and Extension Expert, SEARCA

programs and projects are its human resources, facilities, ICT, and production of IEC materials.

For the period 2014-15, **International Partnerships** was added as an R&D priority while starting 2016, **Scientific Publication Grant** was the new addition.

**Human Resource Development Program (HRDP).** The Program offers the members of the National Research System in Agriculture and Fisheries (NaRDSAF) network of R&D institutions financial assistance to students, employees, and researchers qualified for pursuing undergraduate, graduate, or post-graduate degree courses. This is an effort to increase the number of the workforce that would help mobilize the agriculture and fisheries sector. In 2019 for example, six researchers and employees were supported through the **Degree Scholarship Grants**. The Degree Scholarship is open to the staff from members of NaRDSAF network of R&D institutions who are pursuing MS or PhD degree.

**R&D Facilities Development.** An important function of the Bureau under the R&D Facilities Development Program is the acquisition of scientific and information technology equipment as well as the construction and renovation of R&D facilities (office buildings, laboratories, and experimental farms) of NaRDSAF member institutions. In 2019, BAR inaugurated 11 new R&D facilities in a number of Universities such as the Nanotechnology R&D facility at Central Luzon State University, the Bio-organic waste conversion facility at Benguet State University and the Technology Hub and One-Stop Shop and Plant Health Clinic at the University of the Philippines Los Baños. BAR has also set up its **R&D Technology Commercialization Center** (TechCom Center) at the ground floor of the BAR Building. It showcases research results, innovations, and products developed under the BAR's CPAR and NTCP banner programs

### ***The Banner Programs***

The banner programs of BAR are the Community-Based Participatory Action Research (CPAR) Program and National Technology Commercialization Program (NTCP).

#### **1. *Community-Based Participatory Action Research (CPAR) Program***

A key feature of the program is that they involve the active participation of the local communities in determining the performance of farming systems technologies under specific micro agri-climatic environments within a province or municipality. The approach is intended to be holistic in the overall management of the production system that is instituted through a farm model framework focused on participatory community-based resource management systems. While the program is managed by BAR, it is implemented by the DA's Regional Integrated Agricultural Research Centers (RIARCs) and Regional Integrated Fisheries Research and Development Centers (RFRDCs) as well as the Local Government Units (LGUs) (DA-BAR website). The approach entails both research and extension activities.

The implementation of the CPAR program is nationwide covering various crops, livestock and fisheries and landscapes from ridge to reef to address various issues in these different types of environments. The projects deal with various farming systems such as the corn integrated farming systems, crop-livestock-integrated farming system and banana-based farming systems to name a few; and different packages of technology (POT) such as fertilization, pruning, weeding, net bagging, irrigation, and others depending on the commodities and farming systems involved. A number of projects focus on increasing productivity in the upland areas such as the **corn-based systems in hilly areas**.

These projects have been implemented across 16 regions as shown in Table 5.1. As of June 2020, a total of 290 projects across 639 study sites have been undertaken. For all these projects, total of 7228 farmer cooperators and 336 farmer organizations have been involved.

**Table 5.1: CPAR Projects, Sites, Farmer Cooperators per Region**

REGION	NO. OF CPAR	NO. OF SITES	NO. OF FC	FARMER ORG	OTHER ADOPTERS	TOTAL
CAR	19	41	583	12	180	763
I	19	60	271	27	900	1171
II	35	65	417	6	1581	1998
III	13	26	294	16	275	569
IVA	18	49	336	18	302	638
IVB	19	31	188	6	72	260
V	24	50	1345	33	241	1586
VI	24	40	582	26	0	582
VII	17	27	351	20	268	619
VIII	15	31	528	31	261	789
IX	4	9	46	9	278	324
X	23	63	765	26	696	1461
XI	21	34	480	21	538	1018
XII	11	23	254	12	516	770
CARAGA	11	54	451	50	216	667
ARMM	17	36	337	23	378	715
<b>TOTAL</b>	<b>290</b>	<b>639</b>	<b>7228</b>	<b>336</b>	<b>6702</b>	<b>13930</b>

Aside from the farmer cooperators, 6702 farmers adopted the technologies developed and promoted in these projects for a total of 13,930 beneficiaries.

## **2. National Technology Commercialization Program (NTCP)**

The objective of the NTCP is to push the commercialization of the products of research by supporting the development of agriculture and fishery enterprises borne out of the on-farm technology demonstrations and field trials. The emphases of this **holistic, integrated and market-driven** technology transfer, promotion, adoption, utilization, and commercialization of products from mature technologies that are ready for adoption. The program tries to ensure the proper transfer of mature technologies for adoption and utilization by farmers and fishers. The records of BAR show that since the establishment of the NTCP, the Technology Commercialization Division of BAR has already coordinated 516 projects. For 2018 alone for example, 27 new projects were funded with 59 projects on-going and 39 completed. (Source: DA-BAR)

Notable projects under this program are the **Technology Business Incubation (TBI)** and **Technology Commercialization on Wheels (TCW)**. The objective of the TBI is to nurture emerging technologies and support the growth of agriculture and fisheries-based micro small medium enterprises (MSMEs). This may include technology assistance and scientific consulting, business-support services including access to shared service facilities and laboratories, fund syndication and market linkages—all directed to harness a favorable ecosystem for the competitive Philippine agribusiness. The TCW, on the other hand, was



organized to strategically showcase and transfer packages of technology (POTs) and knowledge products to normally inaccessible areas. For this purpose, a truck was customized to fit swing-out display/exhibit racks for the POTs and products to be displayed.

Under the NTCP, a number of technologies such as the development, promotion, and packaging of high-value products from selected indigenous fruits, the development of native pigs for organic meat production, development of new areas for seaweed farms, commercialization of off-season tomato production technology, commercialization of chevon value-adding technologies, to name some, have been commercialized.

### ***Research and Development Programs***

For the period 2011-2020, DA had 16 R&D programs, namely, organic agriculture, climate change, biotechnology, indigenous plants for health and wellness, adlay, rubber, biofuels, rainfed agriculture, apiculture/beekeeping, soybean and breadfruit, rice, corn and cassava, high value crops, native animals and livestock, and poultry. Starting 2016, seven of them were included in the National Commodity Programs as described below.

#### **1. *Organic agriculture***

This is a priority thrust of DA particularly in implementing agriculture and fishery projects. BAR, as mandated under Republic Act 10068, also known as **Organic Agriculture (OA) Act of 2007**, is mandated to coordinate, develop, enhance, support, and consolidate activities and related technologies for formulating and implementing unified and integrated organic agriculture RDE plans and programs. In compliance with the Act, BAR has coordinated with other agencies of government, bureaus, attached agencies, regional field units, the academe, and the private sector, as well as funded and implemented several OA projects across the country. From 2016-2018, this was considered part of the thematic programs but in 2019, this became a component of the national commodity programs.

For 2013, BAR funded 36 OA R&D projects, out of which 25 were applied research, six were on R&D facilities, and five were on technology commercialization.

#### **2. *Climate change***

This is another program that has been mainstreamed into the respective programs, plans, and budget of the Department as part of the **Adaptation and Mitigation Initiatives in Agriculture (AMIA)** that serves as the umbrella program that aims to address the challenges and threats posed by the changing climate and weather patterns affecting agricultural productivity. The research focuses on developing short and long-term adaptation strategies and mitigation options addressing issues connected with climate change. Examples of these projects are the **climate adaptation protocols and tools** developed at UPLB and the **climate risk vulnerability assessment** conducted in several provinces. BAR's accomplishments may be categorized as support to the R&D efforts of the government and other stakeholders like SUCs, scientific and research communities, international institutions, as well as private-led organizations. Just like the OA program, this was considered in 2016-2018 as part of the thematic programs but in 2019, AMIA became a component of the National Commodity Programs.

#### **3. *Biotechnology***

The **Biotechnology Research and Development (BRD) Program** is one of the programs given funding priority by DA. Biotechnology is deemed an essential and innovative means to increase agricultural productivity and efficiency and address AF challenges. Among the R&D projects provided funding support were the generation of screening protocols and improved crop breeding lines; and value-adding technologies to process wastes and by-products. More than 50% of the Bureau's funding support went to BRD, one of the project components of the

DA-Biotech and BAR collaboration. An important component of the program is strengthening of the capability of R&D and regulatory agencies of DA as well as other partner institutions implementing agri-biotech research and innovation. These include the development of the **Progressive Manpower Enhancement Program (PMEP)** and the **Non-Degree Support Program (NDSP)**. From 2016-2018, this was considered as part of the thematic programs but in 2019, this became a component of the National Commodity Programs.

#### **4. Rice program**

The aim of the **DA National Rice Program** is to increase the productivity and profitability of rice farming and enhance the welfare of rice farmers through development and introduction of improved and state-of-the-art farming technologies. Various partnerships and programs have been implemented under this. In partnership with IRRI, various researches for development (R4Ds) have been implemented such as the **Pest Risk Identification and Management Efficiency (PRIME)**; the **Rice Crop Manager**; **Next Gen Plus**; and **Water Efficient and Risk Mitigation Technologies (WaterRice)**. BAR has also been supporting rice projects that are vital to information generation and technology development such as the **Climate Change-Adaptive Schools**, **Rice Seed Information System**, **Mechanized Direct Seeding Technology**, **Small-scale Irrigation Project (SSIP)** and the **brown rice quality, shelf life, and engineering technologies**. From 2016-2018, this was considered as part of the thematic programs but in 2019, this became a component of the National Commodity Programs.

#### **5. Corn and cassava program**

As DA shifts to a new perspective of food security and profitability among farmers, these two crops are considered important since they are alternative staple food to rice. The major accomplishments for the program include progress in nutrient management, pest resistance and cultural management practices as well as collection, and conservation and development of stress-tolerant traditional corn varieties. From 2016, this became part of the National Commodity Programs.

#### **6. High-value crops**

This is considered important for enhancing agricultural productivity and increasing the income of farmers and rural communities. The Bureau provides funds for researches and technology commercialization of priority commodities such as plantation crops, fruits, vegetables, legumes and nuts, allium, and alternative staple crops. As part of their collaboration and support to the program, BAR and HVCDP worked hand-in-hand to promote not only the traditional fruits and vegetables, but also the underutilized fruits and vegetables including adlay, breadfruit, soybean, and rootcrops, among others. The R&D component of the program has assisted the HVCDP in developing **sustainable cropping patterns and specific packages of environment-friendly technologies for producing high-quality products**. The **technology promotion and commercialization schemes** for some selected high value crops had been developed in coordination with the other divisions of the bureau. Starting 2016, this became part of the National Commodities.

#### **7. Livestock and poultry**

For this program, the Bureau supported research for development priorities across the whole value chain from improving animal health through enhanced and diversified feed resources, breeding, to value-adding through product development and marketing linked to cross cutting programs of the Department in livestock and poultry. One of its important component programs is the **Philippine Native Animal Development Program**.



## **Research for Development and Support Services**

Aside from the human resource and development program and the R4D facilities development program, the Bureau also provides **Scientific Publications Grant**. The grant provides support for conferences, symposia and workshops, knowledge management projects, and book publications. The Bureau also provides intellectual property support to protect and safeguard the intellectual properties (IPs) developed by partner institutions.

### **1. Collaborations and partnerships**

In support of its mandate, the Bureau has forged strategic local and international partnerships. Among the international partnerships forged are the: (a) Asian Food and Agriculture Cooperation Initiative (AFACI) for AFACI funded project on establishing the Agricultural Technology Information Network in Asia and a few other projects, (b) International Rice Research Institute (IRRI) scientific and technical collaboration in support of enhancing the Philippine Rice Industry Competitiveness, (c) the Southeast Asian Regional Center for Graduate Study and Research in Agriculture (SEARCA) in strengthening institutional policies and capacities for the Philippine research for development of communities; (d) the Food and Agriculture Organization (FAO) on agri-biodiversity; and (e) coordination with the Philippine Rubber Institute (PRRI) to participate in the Multilateral Clone Exchange Program with a number of countries.

### **2. Major events and activities**

To promote the outputs of its R&D activities, the Bureau has been organizing different events. Two regular annual events that it has been organizing over the years are the **Agriculture and Fisheries Technology Forum (NTF)** and **Product Exhibition** every August and the **National Research Symposium (NRS)** every October. The NTF showcases technology and product innovations developed by national and regional offices, international organizations, SUCs, and other R&D partners with the goal of developing and strengthening technology-based agri-entrepreneurial linkages and providing commercial opportunities. The NRS, on the other hand, aims to highlight high impact research that can contribute to the achievement of the goals and objectives of DA. It provides a venue for recognizing the researchers and their works with citations and awards.

## **Highlights of Extension Accomplishments: 2011-2020**

The past administrations were heavy on achieving the goal of food security and self-sufficiency. During the time of former Secretary Alcala (2011-2016), the AgriPinoy framework and the FSSP focused on sustainable agriculture and fisheries, natural resource management, and local development. In addition, most of the activities were focused on intensive capability building particularly on organic agriculture as well as climate change adaptation and mitigation. This was due to the enactment of the Organic Agriculture Act of 2010 as well as the adverse effects of climate change which heavily affected the country's agriculture sector (e.g., Super-typhoon Yolanda). In response, ATI modified its production-related training activities to integrate the concepts of climate change adaptation and mitigation. Climate change and adaptation were incorporated into the topics discussed in the **Climate Smart Field Schools** as well as **Climate-Smart Farm Business Schools**. Further, information campaigns for the protection of marine and aquatic resources, and food-for-life activities were also intensified to support environmental protection and address climate change effects.

Secretary Piñol (2016-2019) with his Back-to-Basics Program prioritized capacity and capability building of farmers and fishers to ensure the production of sufficient food for the country. One of his priority programs was providing farmers and fishers access to agricultural finance and credit. Thus, ATI in 2018 conducted a series of **financial literacy trainings and**

**briefings for various agri-credit programs for AEWs and farmers.** AgRiDOC trainings, under the rice program, were also conducted to emphasize the **vital role of extension workers in community and leadership transformation** apart from new rice farming technologies. The implementation of the **Farmer Scientist Training Program (FSTP)** that was enacted by virtue of E.O. 710 series of 2008, **was continued under the Corn Program.** Various briefings and other related activities were also conducted in 2017 to strengthen stakeholder support for the **Agriculture and Fisheries Mechanization (AFMech) Law or R.A. 10601.** Also, the **ATIng Gulayan ng DA** and **Urban Gardening** were initiated to support the efforts on food production utilizing urban gardening/backyard gardening through street caravans and free seminars.

In 2019, the **‘new-thinking’ strategy and eight paradigms** were introduced by Secretary Dar to support the vision and twin objectives of a “food secure Philippines with prosperous farmers and fishers” known as **“Masaganang Ani, Mataas na Kita.”** Various capability building programs on rice, corn, livestock, HVCD, OA, as well as programs for the youth were conducted. Unlike the thrust of previous administrations to directly capacitate farmers and fishers, the new administration **shifted to capacitating LGUs particularly the AEWs** (as mandated by laws; AFMA and Local Government Code). This is also **in preparation for the implementation of the Mandanas Ruling in 2022** which will strengthen the role of LGUs in providing extension services at the grassroots level through additional funds as well as the piloting/implementation of the **Provincial Agriculture and Fisheries Extension System (PAFES).**

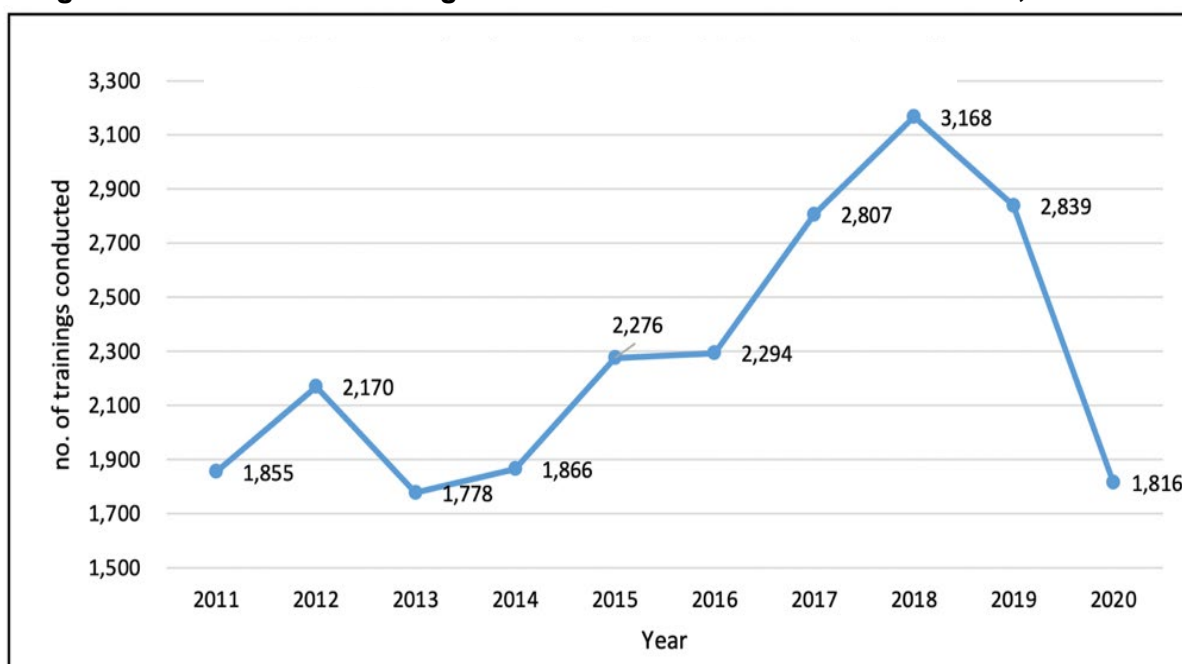
The year 2020 was marked by crisis after crisis due to the African swine fever (ASF), bird flu, and COVID-19 pandemic, which deeply impacted the Philippine agriculture sector, more especially food availability in the urban areas. To address the challenge of ensuring that enough food is available for the urban areas especially Metro Manila, ATI implemented the **Urban Agriculture Program** that aimed to produce food for the households in the urban areas. In addition, several **advocacy campaigns** were organized to increase awareness **on the prevention and mitigation of the ASF.** Various capability building activities were continued, such as the agripreneurship and financial literacy trainings, farm business schools, as well as initiatives for marginalized groups. Also, ATI has been tasked to implement various extension programs as mandated by law including the **Rice Extension Services Program of the Rice Competitiveness Enhancement Fund (RCEF-RESP)** under the Rice Tariffication Law (RA 11203) and the AFMech Law (RA 10601).

ATI has also continued the implementation of various training and education programs aimed at capacitating and enhancing the competitiveness of clients such as the **social and technological trainings on various commodities** (rice, corn, HVCDP, livestock, organic agriculture), **scholarship programs for deserving LGU-AEWs, SUC and DA personnel, educational support and ladderized courses for the youth and/or extension workers,** among others. There were also initiatives on providing extension support to marginalized groups such as senior citizens, rebel returnees, rural women, PWDs, IPs, and mainly those from the fourth to sixth class municipalities. Across ATI’s banner and commodity programs, the dominant trainings conducted varied by different time periods such as rice (2011, 62%), organic agriculture or OA (2012, 32%; 2013, 23%) and regular programs (2015, 35%; 2016, 34%). Credit discipline and financial management trainings, and agripreneurship trainings were also mainstreamed through the **Sikat Saka Program** (2012) and Farm Business Schools (2015), respectively.

During the period of 2011-2020, there was an upward trend in the number of trainings and other related activities conducted. The highest reported was in 2018 with 3,168 trainings (133,979 participants) and the lowest in 2020 with 1,816 (79,614 participants) (Figure 5.1). Through the years, majority of the clients being served by the Institute focused directly on

farmers rather than LGU-AEWs, with an average ratio of three farmers to one AEW being trained by ATI.

**Figure 5.1: Number of Training and Other Related Activities Conducted, 2011-2022**



Source: DA ATI Annual Accomplishment Reports

Since 2011, from simple technology demonstration projects, farm areas were upscaled to **learning sites for agriculture (LSA)** wherein different farming systems and agricultural technologies were displayed for an actual learning experience of visitors and participants. Learning site cooperators were further trained to become trainers/extension workers in the community and elevated into **schools for practical agriculture (SPA)**. These areas are used for micro-teaching of other farmers and out-of-school youths (OSYs). Since 2019, in partnership with the Technical Education and Skills Development Authority (TESDA), some learning sites are now being used as a venue for gaining knowledge and skills on rice-based technologies and practices for RCEF-RESP scholars. As of 2020, there were a total of 1,249 LSAs and 97 SPAs established and certified since 2011.

**Farm and business advisory services (FBAS)** were provided through face-to-face learnings or technical assistance. Communities were organized to strengthen farmer and fisher organizations. The development and strengthening of Rural Based Organizations (RBOs) (4H, RIC, MS, IPs) is a continuing activity.

ATI developed, reproduced, digitized, and disseminated IEC materials in print and digital form. Success stories and good agricultural practices were documented, written, and produced in video format to highlight the heroes in the countryside. These were published as part of ATI's massive information and communication campaign. Fairs and exhibits were also organized together with partners such as the AgriTalks, AgriLinks, festivals, congresses, and consortia, among others.

The development and use of modern ICT tools and applications enhanced access to AFE knowledge and products and services. ATI developed and implemented an online platform for accessing AFE knowledge products and services through e-Extension. The administration of e-Learning online certificate courses increased and at the end of the decade (2020), a total of

69 online certificate courses were administered in the e-Extension website, almost thrice the number since 2011 (25 courses). The year 2020 also saw the highest number of e-Learning graduates totaling 20,712. This was nine times more since 2011 (2,804 graduates), with the highest increase in number of graduates was in 2018 (18,437). This was more than double from the preceding year (2017: 7,096 graduates).

The farm and business advisory services (FBAs) of ATI through the **Farmers' Contact Center (FCC)** and **Rice Crop Manager (RCM)** continued to reach far more individuals than when it started since the last decade. In 2020, the recorded number of recipients of techno-tips on AF text broadcast from the FCC reached 4,364,825. This was a result of the intensification of information dissemination as a response to the COVID-19 pandemic. This was the highest for the decade since 2011. FCC and RCM continue to answer queries and provide technical assistance to farmers and other clients. Advisory services are disseminated through text, call, email, instant messaging, and website forums utilizing the best ICTs available for the intended clients.

Further, social media became an avenue for information dissemination and acquiring new information and knowledge on AF technologies and practices. Different AFE materials uploaded and posted in the ATI website have reached millions of individuals online. Blogging is becoming a trend for clients particularly consumers who feature farms and food, thereby increasing awareness and appreciation by many more consumers. Other high-impact alternative extension modalities such as **Techno Gabay Program (TGP)** and **School-On-the-Air (SOA)** have reached out to more clients in the rural communities. Since the institutionalization of the TGP in ATI, a total of 783 **Farmers' Information and Technology Services (FITS)** Centers were established in 2017. These FITS Centers serve as delivery channels of the **e-Extension Program in the LGUs** to make information more accessible to the clients with the **Magsasakang Siyentista (MS)** providing technical assistance in agriculture and fisheries technology. ATI supported the organization of MS as a rural based organization. In 2017, the MS renewed their registration with the Securities and Exchange Commission with the name **Samahan ng Magsasaka Siyentista ng Techno Gabay ng Pilipinas, Inc. (SMSTGP)**.

The School-on-the-Air (SOA) Program also served as a form of distance learning that included a complete POT of a specific commodity and other agriculture and fisheries related subject matters. ATI implemented this program in collaboration with the Offices of the Provincial and Municipal Agriculturist and local radio stations. The year 2018 saw the highest number of SOAs conducted with 38 programs and 17,049 graduates. SOAs continue to deliver AF extension services through the use of conventional communication technologies in reaching out to farmers and other clientele with no access to modern ICT.

Innovations in extension methodologies and approaches were visible especially with the establishment of SPAs, **farm business schools (FBS)**, **farm and herbal tourism sites (FHTS)**, and conduct of the **arms-to-farms program** by the ATI. Farmers were also linked and provided with social protection and financial assistance/credit programs through its partnerships/linkages with key government agencies such as Social Security System (SSS), Agricultural Credit Policy Council (ACPC), and Philippine Crop Insurance Corporation (PCIC). Public and private partnerships through the accreditation of private **extension service providers (ESPs)** have been initiated by the ATI. The multiplier effect from these private ESPs has helped in expanding the implementation and reach of extension programs to more beneficiaries in the country. As of 2020, a total of 41 extension service providers nationwide were accredited.

Collaboration between and among AFE pillars (national government agencies or NGAs including state universities and colleges or SUCs, LGU and the private sector) became more evident during the national and regional level planning and consultative activities of the

Agriculture and Fisheries Extension Network (AFEN). Even with these improvements, the linkages between research and extension still need to be strengthened and inter-country collaboration more enhanced to make Philippine AFE globally competitive. Some of the partnerships of ATI with various stakeholders include:

- TESDA collaboration to ensure ATI trainees are National Certificate Level II (NCII) ready and qualified to pass TESDA assessment programs. This is aside from the development of Training Regulations for various agri-related programs or curricula.
- Department of Agrarian Reform (DAR) through the Agrarian Reform Community Connectivity and Economic Support Services (ARCESS) program
- Department of Social Welfare and Development (DSWD) to support interventions on early child care and *Pantawid Pamilyang Pilipino Program (4Ps)*
- Department of Education (DepED) to promote school gardens/*Gulayan sa Paaralan*
- DA-Department of ICT (DICT) partnership for the enhancement of Farmers' Information and Technology Service (FITS) Centers
- Digital Farmers Program 101 (DFP) in partnership with the Philippine Long Distance Telephone (PLDT) company – for the youth to assist in introducing the basics of mobile and digital technologies with selected applications and tools to the adult or aging farmers that the latter can use for their livelihood.
- Remnant Institute in Alternative Medicine – promoting herbal medicine and livelihood opportunities to the rural sector (4H, RIC)
- Partnerships with the LGUs and private sector for possible markets benefitting RBOs and farm cooperators
- International Organizations such as Japan's Ministry of Agriculture and ASEAN for capability building activities in agriculture

To realize the efficiency and effectiveness of extension services, ATI promoted the Agriculture and Fisheries Extension Results-Based Monitoring and Evaluation System (AFE RBMES) for determining the relevance and alignment of extension interventions to the goals of the agriculture and fisheries sector. It shifted monitoring and evaluation from focusing on inputs and activities to outputs, outcomes, and impacts.

Different policies and standards were also developed to help improve the delivery of AF extension services. ATI spearheaded the development of the **AFE Grant System, AF Extension Performance Standards, Cost Standards on AFE Services, Co-financing Agreements with LGUs**, and **Merits and Awards System for Extension Workers**. In 2020, the lobbying for the **Magna Carta for Extension Workers** were revived through a series of consultations with key stakeholders.

In 2019, the PAFES was pushed to address the current fragmented extension system. PAFES will provide the institutional arrangement for integrating the implementation of various AF programs and related support services. It aims to further strengthen the capability of LGUs to implement and integrate multiple AF programs with the provinces as the center for operations given the devolution of agricultural personnel and services at the local government level.

## Lessons Learned from Previous Plan Implementation

For the past decade, AF R&D and delivery of extension services in the country have made significant strides as a response to various policies, directions, and plans of the past and current administrations as well as opportunities and threats affecting the sector. However, important areas need to be addressed to improve the conduct of R&D and delivery of extension services especially with the current situation that the Philippine economy and AF sector is facing. The following are the areas of concern, specifically the lessons learned from the previous plan implementation as well as the potentials and constraints toward sector transformation.



## ***On Research and Development***

### ***1. Focus of research***

Related to the identification of priority research given the rapid pace of technological change and the agricultural development strategies that are being adopted by DA, one question that arises is whether the funding agencies dictate the research program or the other way around. Relatedly, given limited research funding sources, are the research funds being distributed too thinly among many different kinds of research issues to the point that the results do not provide significant impacts? Research prioritization is important to ensure that they would provide the most impact. Are the research projects addressing major issues such as those related to identifying new crops with increasing domestic and international demand or the increasingly important issue of climate change that has been greatly impacting the agriculture sector?

### ***2. Accessible research database***

Is there an inventory of AF research that have been funded and conducted by the BAR as well as other agencies to ensure that there is only value addition and not duplication of researches that will be provided funding? Access to outputs of previous research is important to ensure that there is no duplication of the kinds of research that will be approved for implementation and the kinds of data that will be collected.

### ***3. Technical staff shortages***

The available resources and manpower of Regional Field Offices (RFOs) as well as the level of support from their top management on R4D would vary by region. Given the differences in resources, especially trained manpower, a number of regions have aggressive, active participation and initiatives in R4D but many others do not. This may explain why some RFOs do not perform as well as other offices.

### ***4. Capacity of research and development institutions (RDIs)***

This refers to ability of the R&D personnel of these RDIs to undertake high-end research, such as those dealing with nanotechnology, biotechnology, etc., in response to the needs of the Fourth Industrial Revolution (4IR) in Agriculture. This has some implications on: (a) the formal/degree training in agriculture, particularly, curriculum enhancement, laboratory facilities modernization to replace aging infrastructures, and limited opportunities through scholarships for faculty members to attend career enhancement programs both degree and non-degree along the new knowledge frontiers in agriculture; and (b) government budgetary allocations for agriculture, science, and technology.

### ***5. Policy support***

Policy should advance agri-fisheries in a direction that is more forward-looking and proactive rather than just simply problem-solving and reactive. The ASF problem could have been addressed earlier if its consequences had been anticipated and possible solutions had been recognized through research and policy support on vaccines and vaccinations against this viral pandemic in swine, beyond simply border monitoring.

### ***6. Technology dissemination***

An age-old issue faced by RDIs is seeing innovative technologies getting promotion and support after they have been generated. One possible reason for this is the lack of regular stakeholder consultation in order to promote or introduce new technologies and get feedback from clients or major stakeholders. Another is the very weak research-extension linkages, so that most of the research work reach only the pilot research stage. The big challenge is pushing

the findings of research to extension. As such, if that is the case, it would be difficult to see how R&D can progress toward modernization and industrialization.

### **7. Public-private sector partnerships**

A common issue raised is the limited number of technologies developed in the universities that eventually gets commercialized. How can the partnerships of universities with private companies be enhanced so that technologies developed by the universities will be taken up by their private counterparts for commercialization?

### **8. Sustaining the R&D agenda**

A major challenge facing RDIs is ensuring that the AF R&D agenda can be pushed beyond the current leaderships. With the change in leadership often comes changes in R&D funding priorities or focus. How can a long-term R&D program be crafted that will not change with the changes in administration?

### **9. Harmonization of R&D agenda across different agencies**

A number of factors constrain harmonization among agencies of the R&D agenda across different agencies, among which are (a) different perceptions on priorities; (b) control by different agencies of their own resources that are dedicated to their respective priorities; (c) problem of attribution, that is, who gains credit in a collaborative undertaking; (d) parochial perspectives, turfing, and recognition; (e) lack of systematic planning and prioritization across agencies e.g., DA, Department of Science and Technology (DOST), Department of Trade and Industry (DTI) (trade policies; need for science-based policy to support quality control of export products); and (f) limited involvement of the private sector.

## **On Delivery of Extension Services**

### **1. Functional relationship between DA, LGUs**

While it is said that **ATI will serve as the apex agriculture extension agency**, there is **no clear legal and functional basis** for it. Neither DA nor ATI has an institutional channel to work with LGUs on agricultural extension policy, coordination, support, and monitoring. The LGUs do not have a national institution to work with on matters of agricultural extension policy and coordination and partnership support on agricultural extension. In fact, the provision of agricultural services which is allowed by the Local Government Code (LGC) is still managed by central government agencies through the LGUs. As a case in point, while the LGC provides that local government units are responsible for direct delivery of extension services to farmers and fishers, there is a contradictory provision in the Fisheries Code of 1998 (RA 8550) that empowers DA through BFAR to develop cost effective, practical and efficient extension services on a sustained basis for municipal fishers in under-developed areas.

When the Local Government Code of 1991 was passed, agricultural services were assigned to the LGUs without any reference to their being a part of the national responsibility and authority for agricultural modernization and development. As a result, the extension system has been highly fragmented (structurally, organizationally, and programmatically), starting at the DA national level with its agencies to its regional offices and finally to the LGUs through the provincial and municipal agriculturists' offices.

DA does not have policies, coordinative, and resource allocation functions for the devolved agricultural function. On the other hand, for the LGU, the devolved agricultural extension does not have an organizational set-up in providing assistance in extension.

With the extension programs provided by DA and attached agencies, LGUs have not initiated their own extension programs but merely adopt and implement the agriculture programs of DA,



an arrangement that involves less expense but may not be addressing the specific local concerns. For example, some trainings and other related activities conducted by ATI were based on the commodity/banner programming and budgeting of the Department of Agriculture. Some of the trainings were also in support to existing policies and priorities such as the Organic Agriculture Act, AF Mechanization Law, Rice Tariffication Law (RCEF-RESP), Corn FSTP, among others.

The devolved personnel devote most of their time providing technical support to DA programs. DA may have provided LGU extension programs the opportunity to contribute to the overall productivity of the area, but due to the agency's continued presence at the local level may have dampened LGU initiative to develop and implement their own programs.

## **2. Funding**

Financing the devolved extension services have been a persistent challenge to LGUs, which are mostly dependent on the 20 percent development fund for financial support for the broadening array of extension activities. This will change with the imposition of the **Mandanas ruling** that **would increase the budget allocation for the LGUs**. This however does not change the fact that the LGU extension service is still highly dependent on the central government (through internal revenue allotment or IRA) for funding. Also, funding for agricultural services has depended on the economic class of the LGUs and the interests and priorities of each local official.

A consequence of the limited funds for LGU operations is that extension workers have been unable to discharge their duties properly. Reports indicate that extension workers are office bound due to shortage of operational funds for travel and information materials. Mobility of extension workers is rather slow due to lack of vehicles. One reason for this is the centralized system of requesting logistical support. For instance, request for supplies and materials is delayed because supply is centralized at the provincial level.

## **3. LGUs as operational units**

A major issue that has been faced by municipal governments is that they are too small as operational units for agricultural extension. One reason why linkages to research outputs are weak is that municipalities are too small to be able to afford subject matter specialists. There is no mechanism whereby research results generated outside DA are systematically transformed into extension messages. In the context of the agricultural knowledge and information systems (AKIS), devolved extension seems isolated and therefore has weak linkage with national and international agricultural research. Also, these units cannot afford the needed administrative personnel that would provide logistical support. As a consequence, local extension services do not have sufficient relevant new technology to share with their stakeholders. Municipalities are also too small to have short message service (SMS), media, proper monitoring and evaluation, and good links to national and provincial experts. Thus, the important question is whether the 'right' level of government under the LGC is efficiently delivering agricultural extension to the target areas. Lastly, LGUs were not furnished any guidelines on how an ideal extension service should look in terms of staff size, composition, and competencies.

## **4. Financial and career advancement incentives**

With the devolution of the agricultural extension staff from the national DA office to the LGUs, the opportunities of these devolved staff for career growth was closed. The largest proportion of the country's agricultural extension force is with the LGUs, which consist of 79 provinces, 84 cities, 1,525 municipalities, and more or less 42,000 barangays. The opportunities for these agricultural workers who once had stable and promising positions to climb up the career ladder were closed, since most of the provincial offices are not connected with the regional and

national DA structure. This has led to the weak training support for LGU extension staff, which along with low salaries and lack of career path has affected staff morale and confidence of extension workers. Capacities for planning and implementation are weak so that the implementation of national programs is given priority. Knowledge management strategies are more restricted than when extension was not yet devolved. This may have contributed to the low level of acceptability of modern technologies by farmers.

In particular, of great concern is the disparity in remuneration between high- and low-income municipalities. Resolution of this issue is very important to ensure that competent and dedicated extension technologists will be encouraged to stay in service. The commitment and dedication of the extension technologists toward performing assigned functions could improve and sustain the implementation of devolved extension service.

As previously noted, the number of trainings and other related activities conducted by ATI over the period under review have been generally increasing. However, majority of the clients being trained have been farmers rather than AEWs. Moreover, most of the trainings have focused on production, with few topics on the value chain (e.g., processing, marketing). The need therefore is to review the current training offerings to include topics related to the current policy directions and considering local and international AF developments. The curriculum offerings should also be ladderized (basic, advanced, specialized).

While there have been efforts to professionalize and capacitate the LGU AEWs through various ATI programs and projects such as the social and production technology trainings, educational/scholarship support through the Expanded Human Resource Development Program (EHRDP) and the agriculture and fisheries extension grants, these initiatives were discontinued when the projects were completed.

### **5. *Private sector partnership***

ATI was able to harness the participation of the private sector in the delivery of extension services through the certification of learning sites and schools for practical agriculture, as well as accreditation of private extension service providers across the country. This was an important milestone as it created a network of ESPs across the country that supplemented the efforts of LGUs, NGAs and SUCs in extension service delivery. They also served as a channel for the different programs of ATI to disseminate various AF technologies being promoted by the DA.

### **6. *Planning, monitoring, and evaluation***

Problems in implementation often arise because of absent or limited planning, monitoring, and evaluation of projects. As a result, when problems arise in the implementation of a project, it is often too late to address them.

## **Potentials and Constraints Toward Sector Transformation**

### ***Globalization and Economic Integration***

The opening of markets to world trade makes it imperative that competitiveness of the sector has to improve. Special concern is directed at majority of the smallholder farmers who more often than not cannot compete and benefit from regional and world trade. With stringent market requirements, this calls for more earnest efforts to capacitate them not only in terms of increasing the volume of production but also employing food safety, good agricultural practices (GAP), good animal husbandry practices (GAHP), good manufacturing practices (GMP), postharvest handling, farm organization and management, entrepreneurial, value-adding, and marketing skills.

### ***Information and Communication Technology and the Fourth Industrial Revolution***

The 1990s, which manifested rapid progress in telecommunications and computer-based information technology (IT), brought marked changes in the delivery of extension services. Modalities like the e-Extension of ATI paved the way for the electronic delivery of extension services where interested clients can access training courses online. The farmers' contact center was also established to make information more accessible to farmers and other clients by providing voice call and short messaging service (SMS or text) as well as emails and other forms of online communication. Other agencies have also established their knowledge portals like the Rice Knowledge Bank of the Philippine Rice Research Institute (PhilRice). The use of ICT in extension truly enabled a faster and wider access to the vast array of knowledge that AF stakeholders can benefit from.

As the world now enters through the Fourth Industrial Revolution (4IR), digital technologies have revolutionized how food is being produced and marketed, from robotic farming and use of drone technology to the use of mobile services to promote linkages along the value chain. However, with these innovations, it is both a challenge and an opportunity for the country to rapidly modernize agriculture and fisheries to make production and marketing more efficient and at par with advanced agricultural countries. According to the World Economic Forum (WEF, 2018), the 4IR has resulted to better information flows, lower transaction costs, and faster communication. This made doing business easier. Apart from the technological innovations in production, research and extension have a huge role in harnessing the potential of various digital platforms in transferring knowledge and information to smallholder farmers and fishers.

### ***Multifunctionality of Agri-Fisheries***

As indicated in the National Extension Agenda and Programs (NEAP), the multi-functionality of agri-fisheries opens new opportunities for the sector, creating new markets and job prospects. The diverse use of agri-fisheries requires new capabilities and skills that can be responded to by research and extension.

### ***Booming Farm Tourism Potential***

In 2019, the Philippines has been recognized as one of the top farm tourism destinations in the world due to its natural resources, biodiversity, and the hospitality of Filipinos (Galang, 2019). With the law supporting the development and promotion of farm tourism (R.A. 10816), the public and private sector must maximize the benefits that can be derived from agri-fisheries and tourism. The law recognizes that agricultural extension is an integral part of these farm tourism sites as they can promote environment-friendly, efficient, and sustainable farm practices for would-be visitors. Developing the farm tourism industry serves as a catalyst for the development of agriculture and fisheries communities as rural incomes of farmers, fishers, and farm workers are potentially increased.

### ***Demographics***

With the country's population at 109.5 million in 2020 and still increasing, the pressure on agriculture and fisheries to supply the needs of a growing population with decreasing land area devoted to agriculture points at productivity enhancement measures to cope with the need for food in both local and international markets aside from the needs of other industries such as the health industry that must be met by the agriculture and fisheries sector.

However, since majority of the farmer population are resource-poor, the adoption of modern technologies like the use of hybrid rice seeds pose difficulties, for they perceive this to require

more costly inputs. The adoption of productivity enhancing technologies is therefore a great challenge for research and extension, especially with the implementation the Agricultural and Fisheries Mechanization (AFMech) Law or R.A. 10601 where modern, appropriate, and environmentally-safe agricultural and fisheries machinery and equipment must be promoted to achieve food security and safety as well as increase farmers' income.

### ***Aging Farmers and Declining Interest of Youth in Agri-Fisheries***

With the Philippines having the third youngest population in the Asia Pacific Region and the average age of the Filipino farmer reported to be 57 years old, Habito (2018) explained that the younger generation of millennials has stepped back from agriculture and fisheries because of relatively lower wages and productivity compared to other industries. Apart from this, the number of agricultural workers declined since 2011, with 250,000 workers on the average leaving the sector annually. In addition, farmers are the least educated among workers as one-third have not even completed primary education.

The Asian Farmers' Association for Sustainable Rural Development (AFA, 2015) also noted that the youth are not attracted to agriculture mainly due to the following reasons: (1) farming is regarded as a lowly and unglamorous job, (2) lack of curriculum on land, agrarian reform, and agriculture, (3) lack of supportive government policies and programs for family farmers, and young farmers, (4) lack of rural infrastructure, and (5) lack of organization of young farmers besides the 4H Club. Apart from this, young farmers face several farming constraints such as inadequate skills and knowledge on production, processing, and business; lack of access and control to resources and markets; and globalization and commodity price variability.

### ***Climate Change and Other Shocks***

The Philippines is identified as one of the most vulnerable countries to climate change impacts, being located in the Indo-Pacific area. Composed of 7,641 islands or 32,400 kilometers of discontinuous coastline, climate change is a major cause of concern. A World Bank (n.d.) report stated that storm surges are projected to affect about 14 percent of the total population and 42 percent of coastal populations. Informal settlements, which account for 45 percent of the Philippines' urban population, are particularly vulnerable to floods due to less secure infrastructure, reduced access to clean water, and lack of health insurance.

Climate-related impacts are expected to reduce agricultural productivity in the Philippines. Also, warming oceans and ocean acidification affect coral reefs, which serve as feeding and spawning grounds for many fish species that support the livelihoods of fishers.

Apart from the effects of natural hazards and climate-related disasters, the Food and Agriculture Organization (FAO, 2016) reported the need to address different shocks threatening agricultural livelihoods. These shock groups are natural hazards including climate change extreme events, food chain crises of transboundary or technological threats such as plant pests and diseases, animal diseases and food safety and protracted crises including violent conflicts. Over the past years, the human food chain has been under serious threat with an increase in the number of outbreaks of transboundary animal and plant pests and diseases. Avian influenza, coconut pest infestation, and the recent African swine fever are some of the cases of threats to the human food chain affecting food security, human health, livelihoods, as well as economies and international trade.

FAO (2016) added that protracted crises, often caused by man-made factors such as violent conflicts, are among the most challenging issues that make difficult the fight against hunger, malnutrition, and poverty. However, the role of the agri-fisheries sector in crisis situations is often ignored or response interventions are slowly implemented. Since smallholder farmers and fishers are the backbone of the developing world, building resilience in agricultural

livelihoods is necessary to eliminate hunger, achieve peace, stability, and sustainable development of generations to come.

### **Weak Research-Extension-Farmer Linkages/Extension Delivery**

One of the recurring issues experienced at the local level is that the technologies being transferred by government agencies do not meet the needs of farmers and fishers. This is due to the lack of close working relationships between agricultural research and extension agencies and institutions, as well as various farmers, fishers, and their respective organizations. This problem of weak research, development, and extension (RDE) linkages continues to affect the flow of information, knowledge, as well as resources among actors in the agricultural technology system (Kaur and Kaur, 2013). Hence, farmers have limited decision-making options on technologies suitable for their farming and fishing needs.

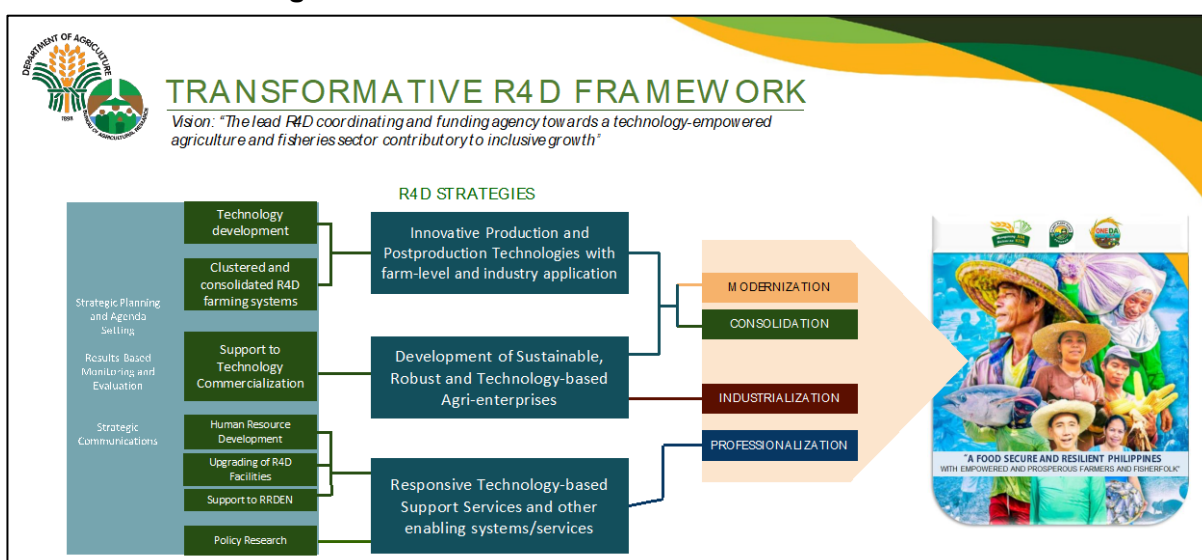
In addition, weak RDE linkage also explains the present low adoption of technology and minimal research utilization as research results in many instances cater only to journal publications rather than to their intended AF users. The adoption of technologies being introduced by extension workers would be low

without proper planning involving key AF actors. Effective linkage among researchers, extension workers, and farmers is vital for development and dissemination of appropriate and location-specific farm technologies.

### **RD&E Strategies Aligned with DA New Thinking**

Figure 5.2 shows the different strategies for research as well as extension that are aligned with the DA New Thinking. These include consolidation, modernization, industrialization and Professionalization. The strategies aligned with DA New Thinking is outlined in the OneDA Reform Agenda. The four key strategies include: Consolidation, Modernization, Industrialization and Professionalization.

**Figure 5.2: Transformative R4D Framework of DA**





## **Consolidation**

Initiatives related to the strategy on consolidation are as follows:

1. The “**Bayanihan Agri Clusters**” (**BAC**) involve the integration of government interventions—such as provision of loans, farm mechanization, free seeds and fertilizers, and market support—to organize farmer/fisher groups such as farmer cooperatives or associations. BACs aim to empower stakeholders to reduce production costs, gain more benefits from the agri-fisheries value chain, and direct interventions to achieve economies of scale. Aside from the farmer and fisher groups, it is also important to organize development partners that would link the farmer/fisher groups to the market.
2. With the **Province-Led Agriculture and Fisheries Extension System (PAFES)**, the province serves as an extension hub that synchronizes agricultural plans and programs as well as orchestrates the activities of the various stakeholders. DA will co-plan, co-invest, co-implement, and co-monitor priority projects in the provinces, particularly as they embark on commodity specialization to maximize comparative advantage.
3. **Crop diversification** is another strategy to promote and hasten agricultural development. Both physical and economic factors affect the adoption of crop diversification schemes. Physical factors include land capability, rainfall patterns, water quality, crop suitability, and technology. Economic factors, on the other hand, include costs, prices, markets, and economic viability of alternative cropping schemes. This strategy was pursued to support food security, greater employment opportunities, increased farm incomes, and reduced dependence on traditional export commodities that are facing declining demand in the world market.

## **Modernization**

To attain the vision of modernizing agri-fisheries, it is imperative to:

1. **Develop a blueprint for a long-term R&D plan** that will transcend changes in DA administration. It can start with the directions and strategies of the current leadership of DA.
2. **Upgrade the physical infrastructure and facilities** for research and extension.  
This will include not only research laboratories but also facilities such as localized agri-meteorological systems for more climate change- and disaster risk-informed spatial planning. In building the physical infrastructure and facilities, the policy is building back better.
3. **Provide sufficient, trained manpower** for research and extension programs. This is true not only for the research and extension personnel of the LGUs, but also those of BAR and ATI who should be capacitated with up-to-date and relevant trainings to improve their competencies based on their functions/responsibilities. Sustaining the operation of climate field schools and provision of farmer advisory services for informed farm decision-making would also be important. Likewise, it would be useful to provide competitive grants in support of catalytic RDE initiatives, such as commodity research and community-based participatory action research, AFE policy studies, and RDE program evaluation.
4. **Intensify conduct of R&D Initiatives.** The objective is to develop and commercialize mature technologies and innovations including digital agriculture and fisheries. R&D priority should also be given to sector-wide concerns, including climate change impacts, adaptation and mitigation measures, environmental management, infrastructure design, mechanization, efficiency in inputs, high-yielding and resilient varieties, genetic diversity and improvement, pest and disease control, and postharvest handling and packaging.

5. **Protect Intellectual property rights (IPR).** This refers to the rights of people and organizations who develop innovative technologies by ensuring the proper licensing of users to encourage more market-oriented, sector-relevant, and commercialization-ready R&D activities.
6. **Harmonize R&D efforts.** Implement the RDE agenda with other national government agencies, state universities and colleges, local government units, business sector, and non-government organizations. Specifically for R4D, there is a need for continuous harmonization of efforts and strengthening of the partnerships of the DA (national and regional offices) with the private sector (for market-driven approach) and the academe (for a science-based approach, and R4D-to-E continuum). The bureau has re-established the Regional Research Development and Extension Network (RRDEN) to strengthen partnerships with the SUCs in regional agenda-setting, screening of proposals, and M&E of projects. Standards and guidelines also need to be developed to harmonize the delivery of RDE interventions across different actors and support the creation and establishment of linkages among other RDE organizations and individuals for strategic collaborative work.
7. Continue **monitoring of targeted plans and accomplishments.** With LGUs and AEWs as the main clients of developed technologies and extension services, efficient planning, monitoring, and evaluation systems using modern ICT/information system that integrates all databases of ATI must be developed and upgraded to enhance decision and policy making based on accurate and reliable data. Massive information dissemination, advocacy of sustainable AF practices, and climate change preventive and adaptive technology transfer must be facilitated through extension services. The current initiative of ATI to develop the LGU AEW registry system will aid in planning appropriate interventions as well as monitoring and evaluation of its clients. Similarly, the monitoring and evaluation of the products of research is important to ensure adequate feedback on the performance of the generated technologies. This will provide the basis for developing technologies that will improve productivity and production efficiency for the producers and various actors along the value chain.
8. **Promote an enabling environment** to properly conduct RDE interventions and ensure its efficient and effective delivery through formulation of policies with respect to RDE, creation of policy briefs for the consumption of policy and decision makers, and instituting policies and plans geared toward improving and capacitating the LGU extension system.

### ***Industrialization***

This is the key to modernizing the Philippine agri-fisheries sector. The major strategies and elements for industrializing the agri-fisheries sector are as follows:

#### **1. *Agri-industry business corridors (ABCs)***

Many developing countries have adopted agri-industrial growth corridor approach for developing their agri-fisheries sectors. These corridors promote inclusive agribusiness growth, building on a linear agglomeration of people and activities along existing transportation infrastructure. This approach comes at an opportune time as it complements the government's currently aggressive infrastructure development program known as the "Build, Build, Build" Program, which seeks to pursue efficient public transportation system and improve connectivity across the country to include especially the most far-flung areas. What attracts investors to invest are the infrastructures as well as the public-private partnership arrangements and concessional finance. It is hoped that the investments in the agri-fisheries sector such as the postharvest and processing facilities as well as the logistical and marketing support that are integral components of ABCs will improve productivity and market linkages in agri-fisheries, thereby increasing incomes and stimulating local economies. Attention should



be given to good corridor design and implementation practices especially on how to apply this model to the agribusiness and agri-industrial sector.

## **2. Assistance to LGUs in planning and implementation of ABCs**

The location of ABCs cross the boundary of local government units. It is important to provide technical and financial assistance in planning and developing the ABCs. This would include determining the potential markets for exporting our champion commodities as well as identifying the key for investment areas for export development, processing, logistics, and marketing support.

## **3. Migration of farm labor**

One of the impacts of industrialization as experienced by the more developed countries is the growth of small industries providing ancillary services to agriculture. Given the more attractive wages in the non-farm industries, farm labor is expected to migrate to these small industries. The small labor force left in agriculture will be better trained but better paid and assisted by modern farm machineries.

## **Professionalization**

An important element for modernizing and industrializing the agri-fisheries sector is the support of trained manpower. The suggested measures are as follows:

1. **Continuous capacitation** (human and facility resources) of the R4D workers and institutions for them to be knowledgeable and adaptive to ever-evolving technologies, innovations, and advancements, and to provide better technological services to their localities (also by improving technology transfer modalities). It would include support for conducting trainings, developing IEC materials, establishing technology demonstration sites, and providing advisory services
2. **Extension should take advantage of the country's young population** by developing capacity building and scholarship programs, strengthening youth organizations for agriculture and fisheries, and establishing an appropriate enabling environment to attract the youth to venture in the sector.
3. **Implement the RDE agenda with other** national government agencies, state universities and colleges, the local government units, the business sector, and the non-government organizations. The creation and establishment of linkages with other RDE organizations and individuals for strategic collaborative work should be supported. RDE institutions should also be capacitated to upgrade, modernize, and properly maintain their facilities, infrastructure, and equipment through BAR's R&D Facilities Development Program grants, and ATI's Techno Gabay Program, FITS, and knowledge centers.
4. **Advocate for the passage of the Magna Carta Bill for RDE workers** to provide a harmonized structure, standardize the functions and responsibilities of RDE personnel, and ensure appropriate allocations for salaries, wages, and other incentives. This also requires implementing an institutionalized merit-based incentive and reward system for high-performing RDE personnel and institutions, including awarding them scholarship grants, i.e., formal (post-graduate degree) or nonformal (advanced and specialized trainings).
5. **Intensify provision of knowledge services** to enhance the skills, capacities and competencies of DA clients through:
  - Schools-on-the-air, e-extension courses, farmers' contact centers, seminars, and information caravans, among others

- Training on relevant agri-fishery subject matter; technology demonstration and establishment of learning sites that showcase agri-fishery technologies; educational tours to model farms and institutions that feature agri-fishery related good practices; and provision of after-training support through start-up kits for the adoption of the technologies learned
- Capacity building assessments including training needs assessment, training effectiveness assessment, and training impact assessment
- Stronger provision of RDE knowledge products in the vernacular such as leaflets, videos, etc., to communicate agri-fishery information and technologies through quad media.

## Indicative Policies and PPAs to Address Potentials and Gaps

Given the mandate of BAR and ATI, the following are suggested policies, plans and programs to address potentials and gaps in Research and Extension.

1. As the premier agency for research and extension, **lead in the policy-making, standard-setting, harmonizing and unifying** the research, training, and agriculture and fishery extension system. These would include:
  - a. **Assessing the landscape** of Philippine research, extension and training system;
  - b. **Institutionalizing the relationship** between DA and LGUs;
  - c. **Developing standards and protocols** for conducting evaluation studies of programs, projects, and activities provided by research and extension service providers;
  - d. **Reviewing the existing M&E systems** (output monitoring and RBME system) and their feedback mechanisms;
  - e. **Identifying areas of complementarity and optimization of resources** among the different government agencies and AFEN member agencies;
  - f. **Determining the impact** of existing (Livelihood Enhancement for Agricultural Development) LEAD project/activities (including that of PAFES);
  - g. **Reviewing agricultural training and advisory services policies** and develop appropriate implementing policies and guidelines as well as specific action plans and programs;
  - h. **Reviewing BAR's and ATI's strategies and approaches** in presenting its corporate image and branding;
  - i. **Enhancing corporate materials** focusing on the role and impact of BAR and ATI in the agri-fisheries sector; and
  - j. **Ensuring the awareness and understanding of ATI personnel of ATI's mandates and functions** as well as programs, projects, and activities being delivered.
2. **Develop the criteria for prioritizing the R&D and extension programs** that will be funded based on the OneDA approach of the Department.
3. **Support the LGUs in developing their own programs and priorities** especially the ICT.
4. **Evaluate the conditions of the research facilities of RFOs** and provide funding for upgrading these facilities in consideration of the priority programs.
5. **Identify the Agri-Industry Business Corridors** in the country together with component infrastructure and facilities as well as the market linkages for inputs and outputs for the entire value chain.

6. **Undertake research that would support the implementation of the ABCs.** In addition, research and extension programs should facilitate the participation of smallholder farmers and fishers (SFF) in the ABC programs.
7. **Continue strengthening and sustaining collaboration with international agencies** to be in the loop of new technological developments in agri-fisheries, especially in the priority crops.
8. **Formulate the roadmap and enabling policies** to steer the country's training and agricultural advisory/extension system, harmonizing the implementation of fragmented pluralistic training and extension services provided by LGUs, SUCs, NGAs, NGOs, private extension service providers, and other stakeholders; and ensure that extension functions are clearly delineated and implemented accordingly. These would include:
  - a. **Reviewing the current organizational structure and programs** in light of the implementation of the Mandanas ruling;
  - b. **Developing a centralized information system** for the ATI; and
  - c. **Enhancing the national and regional AFEN partnerships** in support of the PAFES and the operationalization of the OneDA approach.
9. **Provide training, technical assistance, and advisory services** responsive to the real needs of agricultural extension workers, farmer-leaders, and members of organized farmer groups to enable them to serve as farmer extensionists, local farmer technicians, and partners. Together, they form a cadre of para-extension professionals who will provide grassroots assistance and best-fit extension services in their respective localities. LGUs shall conduct training of farmers and provide direct extension services in accordance with the Local Government Code (RA 7160) and the Supreme Court decision on the Mandanas ruling. These would include:
  - a. **Training a cadre of specialists at all levels** of the extension hierarchy; and
  - b. **Enhancing the competency-based learning and development plan** for ATI personnel and training plan for AEWs and organized clients.
10. **Undertake a continuing training needs assessment and curriculum review**, specifically to consider the following:
  - a. **Review of previous training needs assessment** conducted by various training providers;
  - b. **Regular programs** to capacitate and develop career development paths for AEWs;
  - c. **Regular training programs on agricultural development planning** that will be attended by provincial and municipal agriculturists;
  - d. **Demand-driven training** curricula, programs, and learning support materials/modules; and
  - e. **Regular programs for AEWs** on new technologies and innovative training approaches that recognize learning capability and local circumstances of all farmers, fishers, women, youth, and children.
  - f. **Showcasing of training and knowledge resources and products** through field demonstrations, and the use of appropriate social media and digital platforms and strategies to ensure inclusivity particularly among those deprived of the ability to read and write, especially the indigenous people (IP) and all others from far-flung, challenging to reach areas;
  - g. **Appropriate training requirements** for smooth work relationships/ complementation and collaboration toward sustainable funding arrangements;
  - h. **Programs, projects, and activities in compliance with the ease-of-doing business approach**;

- i. **Updated and accessible learning materials and resources;**
  - j. Degree of **access and readership of ATI's corporate materials;** and
  - k. **Monitoring and evaluation of training and advisory activities and critical policies** governing the work of different extension service providers to determine results, outcomes and impacts.
11. DA should **develop an institutionalized mechanism among agencies to bring effective interface and better coordination** of services and avoid duplication and overlapping of efforts.
  12. Policies must also be developed to **strengthen linkages between and among RD&E agencies and institutions and the private sector** providing support services (credit, irrigation, inputs, marketing) in order to facilitate transfer/ commercialization and sustained adoption of modern AF technologies generated/developed.

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## CHAPTER 6

### Issues Relating to Credit Markets in the Agri-Fisheries Sector<sup>24</sup>

The World Bank Enabling the Business of Agriculture (EBA) Report of 2017 (World Bank Group, 2017) outlined the importance of finance, in the forms of both credit and insurance, as a key element to agricultural sector development. This is due to the potential impact of these instruments, which include working capital, seasonal loans, and medium- to long-term credit, in addressing the needs of farmers and other agricultural producers. Additionally, such financial services may also aid in financing and smoothening out production throughout the year, which tend to experience fluctuations due to the environmental risks associated with agriculture (Karlán, Osei, Osei-Akoto, and Udry, 2012; Cai et al., 2009 as cited by Tiongco et al., 2019). Apart from agricultural risks, agri-fisheries sector participants also need personal financial buffers for unseen rises in expenditure because of unanticipated needs (e.g., illness, death, personal crises that can threaten a farm business) that may reduce the overall capital available for smallholder producers in the long run. Finally, credit extended to agri-fisheries producers is also essential for possible expansions in total long-term production either through the adoption of new technologies and/or expansion of businesses.

These potential benefits of finance in the agri-fisheries sector clearly demonstrate the substantial role of financial services in reducing rural poverty. Agriculture and fisheries tend to be the main source of income among the rural poor and as a result, agri-fisheries growth can reduce rural poverty rates faster and more effectively relative to other sectors (Christiansen, Demery, and Kuhl, 2011, as cited by Tiongco et al., 2019). Thus, a properly performing financial market in the agri-fisheries sector could also have a positive effect on the overall welfare of smallholder farmers and fishery operators.

Despite these benefits of finance in agri-fisheries, credit and insurance is often lacking for producers in this sector in what can only be described as a form of market failure (Rosenzweig and Binswanger, 1989 as cited by Tiongco et al., 2019). Reasons for this failure, however, tend to be numerous and varied.

The risks associated with unpredictable environmental factors are “dis-incentivizing” potential providers of financial services from entering the agri-fisheries markets. This is because such risks of undercutting profits for financial service providers in the agri-fisheries sector may increase risk premiums for credit. This may potentially increase defaults among agri-fisheries borrowers or may even discourage them from acquiring such financial services in the first place. Consequently, potential financial service providers simply choose not to enter the market.

According to Stiglitz and Weiss (1981, cited by Tiongco et al., 2019), information asymmetry is a possible cause for this market failure. This is because most prospective borrowers in the agri-fisheries sector have no previous credit histories. On the other hand, potential providers

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<sup>24</sup>Prepared by Christian G. Lauron, Jose Rafael V. Marcelo, and Paul John B. Gesta, Agricultural Credit and Financing Team, Sycip Gorres Velayo & Co. (SGV)



of financial services have limited knowledge on who is more likely to default and who is likely able to repay. This lack of information then leads to an aversion for such providers in entering agri-fisheries markets. Such information asymmetries may also be worsened by the generally poor infrastructure in rural settings, which would make information gathering more difficult. Walter (1945 cited by Tiongco et al., 2019) stated that financial service providers may also be unwilling to provide credit and insurance to agri-fishery households due to the cultural tendency of not separating farm/fishery and family expenditures, which often resulted in difficulty in repaying loans.

Reasons for this perceived market failure in the Philippines, however, tend to be less general as those noted by these international studies. For instance, the primary issue resulting in this type of market failure in rural Philippine agri-fishery credit markets did not directly involve the reasons stated by the above studies (Poliquit, 2006 as cited by Tiongco et al., 2019). In fact, the study pointed to a simple mismatch between the preferences of borrowers and banks when it came to paper work and other requirements, where rural borrowers preferred less complicated processes while banks preferred more detailed and demanding requirements in order to lessen their risk exposure. As a result, agri-fisheries borrowers in the Philippines have tended to prefer informal lenders due to the simplicity of the processes involved.

More case-specific reasons explain the difficulties in the agri-fisheries credit markets in the Philippines in the evaluation of the Agricultural Credit Policy Council of the DA (Geron and Erfe, 2015, as cited by Tiongco et al., 2019). In their analysis of some of the issues, which reduced the effectiveness of this institution, they noted that the lack of financial literacy among agri-fishery producers resulted in most potential borrowers avoiding institutional lenders both public and private. As a result, these borrowers end up borrowing money from lenders imposing high interest rates (e.g., loan sharks) and offer simpler and easier-to-understand packages. Coupling this aversion are the risks that affect agriculture and fisheries production that could drive banks away from providing loans due to non-repayment of borrowers. Thus, the borrowers may face a limited number of lenders and may find difficulty in switching from one lender to the another. Practically, the objective of lenders is to maximize expected profit, which depends on high interest rates, but this may also increase the probability of default. Hence, agri-fisheries producers are not accessing credit while formal lending institutions are discouraged from offering credit. As a result of these imperfect information, credit markets may be inoperative or may not function well.

Llanto (1993 and 2004 cited by Tiongco et al., 2019) also reiterated the role that risk played in the ineffectiveness of financial institutions in Philippine agri-fisheries while also noting other factors. Llanto (1993, cited by Tiongco et al., 2019) noted that the banks and non-bank financial institutions did not simply avoid lending to small agri-fishery producers due to the risks involved, but they instead tended to allocate most of the loans they allotted for agri-fisheries to larger and more established producers. The reason was that such producers were capable of better managing possible risks and could thus be more profitable clients for lenders than small producers. Thus, in a sense, these larger producers tended to crowd out smaller would-be borrowers. Llanto (2004, cited by Tiongco et al., 2019) also added that regulatory restrictions on lending activities as well as biases for certain agricultural sectors and incomplete or non-functioning supporting institutions tend to aggravate the problem of credit accessibility. These sentiments were also reiterated by Geron and Casuga (2012, cited by Tiongco et al., 2019) who added that government actions could also play a role in aggravating some of the problems generated by these issues.

Cuevas and Sumalde (2015 cited by Tiongco et al., 2019), on the other hand, showed that low interest rates may not be the only factor in a farmer's or fishery operator's choice on where to borrow. They found the more important indicators to be transaction costs involved in loan processing (Llanto, 1993, cited by Tiongco et al., 2019), like total number of requirements; distance or proximity of the lender, i.e., accessibility; and length of time before loan approval.



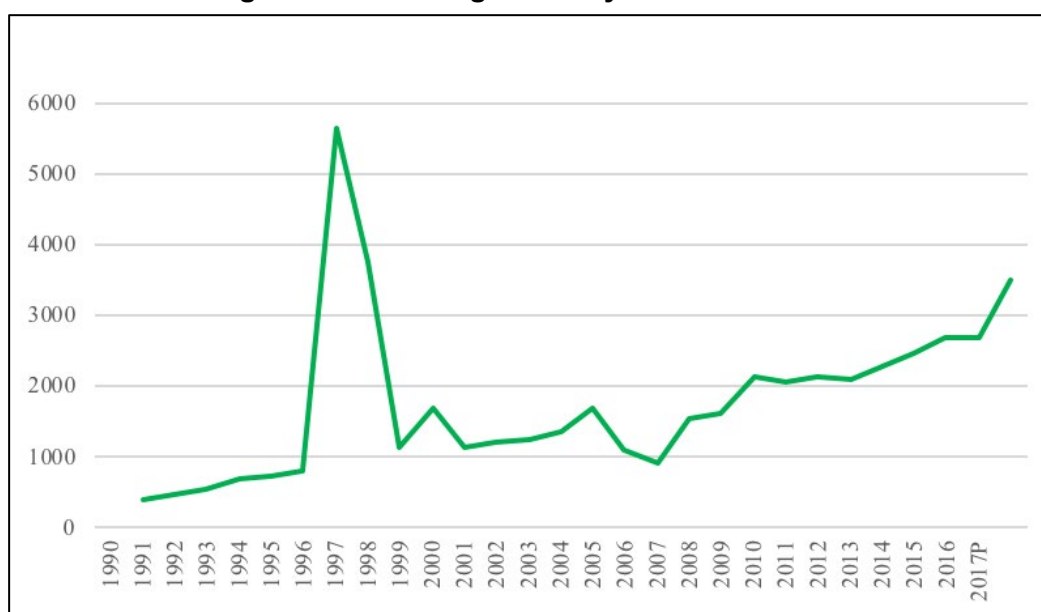
Despite these reasons and acknowledging the potentials that finance holds for the agri-fisheries sector, several efforts have attempted to correct this apparent market failure. Most of these efforts fall under the umbrella term of rural finance (International Finance Corporation, 2011). These include the likes of rural banks, which leverage the local knowledge in communities they are located in to try to reduce the information asymmetry problem. Microfinance providers, which theoretically reduce the probability of default due to the small loan amounts involved with minimal fixed costs, and the ability of farmers to work their way up to larger loans, are predicated on successful repayment of each subsequent loan. There is also that social collateral involved in microfinance because of the joint liability between borrowers and lenders, hence resolving asymmetric information issues such as adverse selection (because members will only agree to be jointly liable for those they trust) and moral hazard (because members are incentivized to exert suasion to ensure repayment by their group members) (Stiglitz and Weiss, 1981 as cited by Tiongco et al., 2019). However, these efforts risk institutions in becoming natural monopolies and effectively limit the number of potential providers in the market, resulting in imperfectly competitive agri-fisheries credit and insurance markets. This could in turn be detrimental to the overall welfare of smallholder farmers and fishers.

### Overview of Agri-Fisheries Credit Markets in the Philippines

Historical data shows that loans to the agri-fisheries sector have been gradually increasing from 1990 until the sudden peak in 1997 and fall in 1999 (Figure 6.1). The spike accounts to the banks' response during the Asian financial crisis where they were looking for best alternative ways to comply with the required agri-fisheries loans. Growth rates for total agri-fisheries loans from 2010 exhibited an increasing trend.

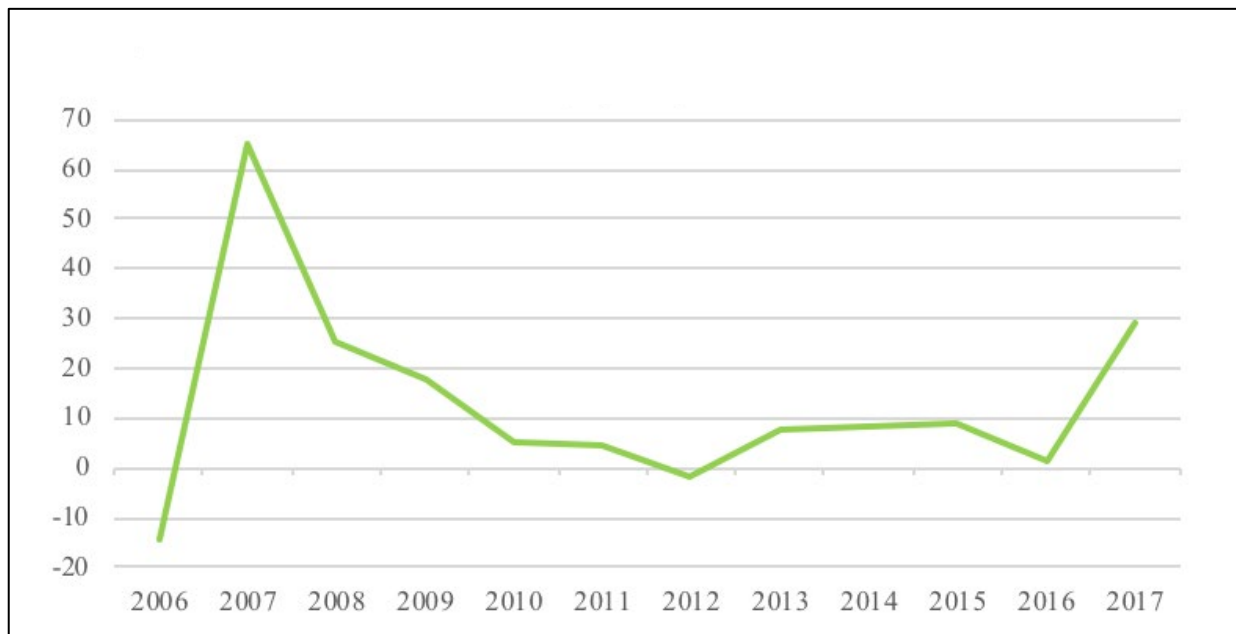
Among the providers of agri-fisheries loans, the private banks have been the biggest source, with private commercial banks having posted the highest lending increments, particularly during 2016-2017. However, loans from government sources slowed down their support since 2011, and then started to expand their assistance in 2015. In 2017, they recorded the highest credit assistance among banks lending agricultural loans. These are illustrated in Figures 6.1 to 6.4.

**Figure 6.1: Total Agri-Fishery Production Loans**



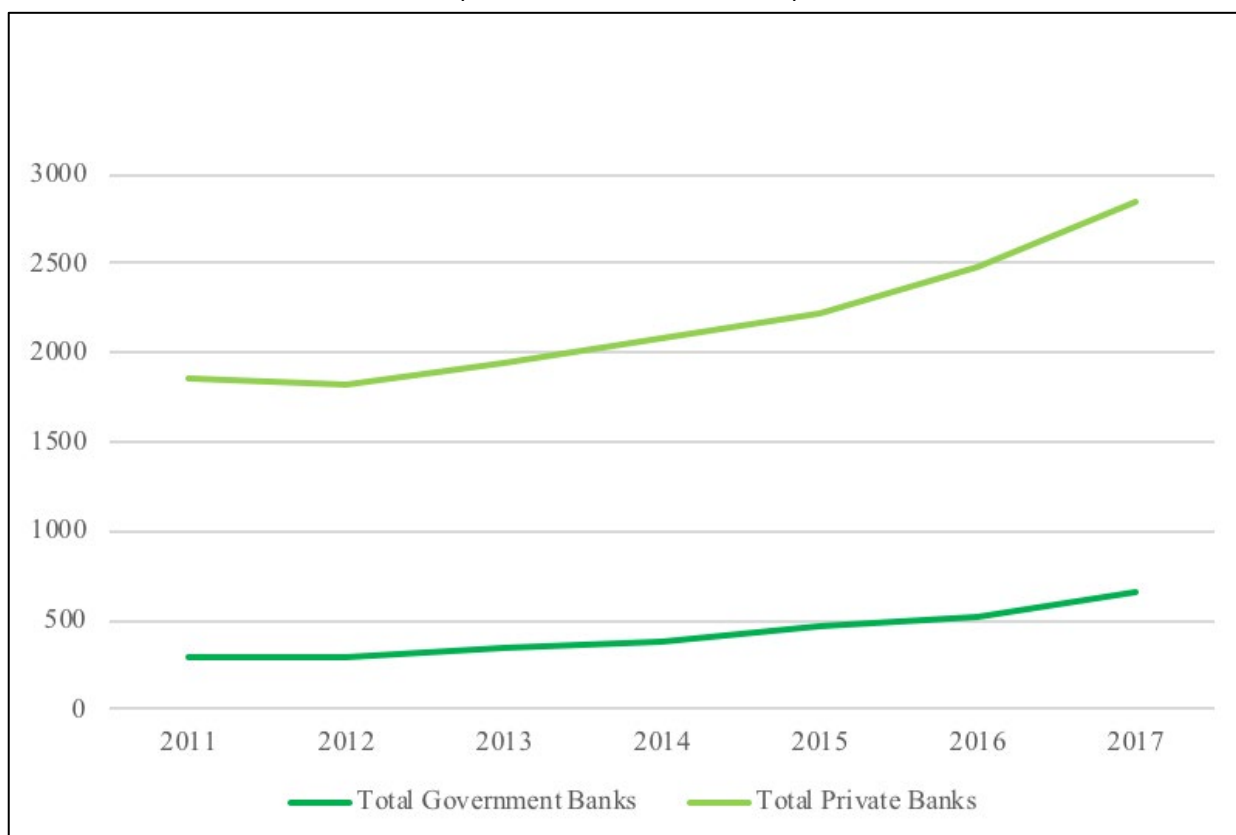
Source: Philippine Statistical Authority Agricultural Indicators System: Agricultural Credit, 2012-2018

**Figure 6.2: Growth Rates in Agri-Fishery Production Loans (at Current Prices) Granted by All Banks (in Percent)**



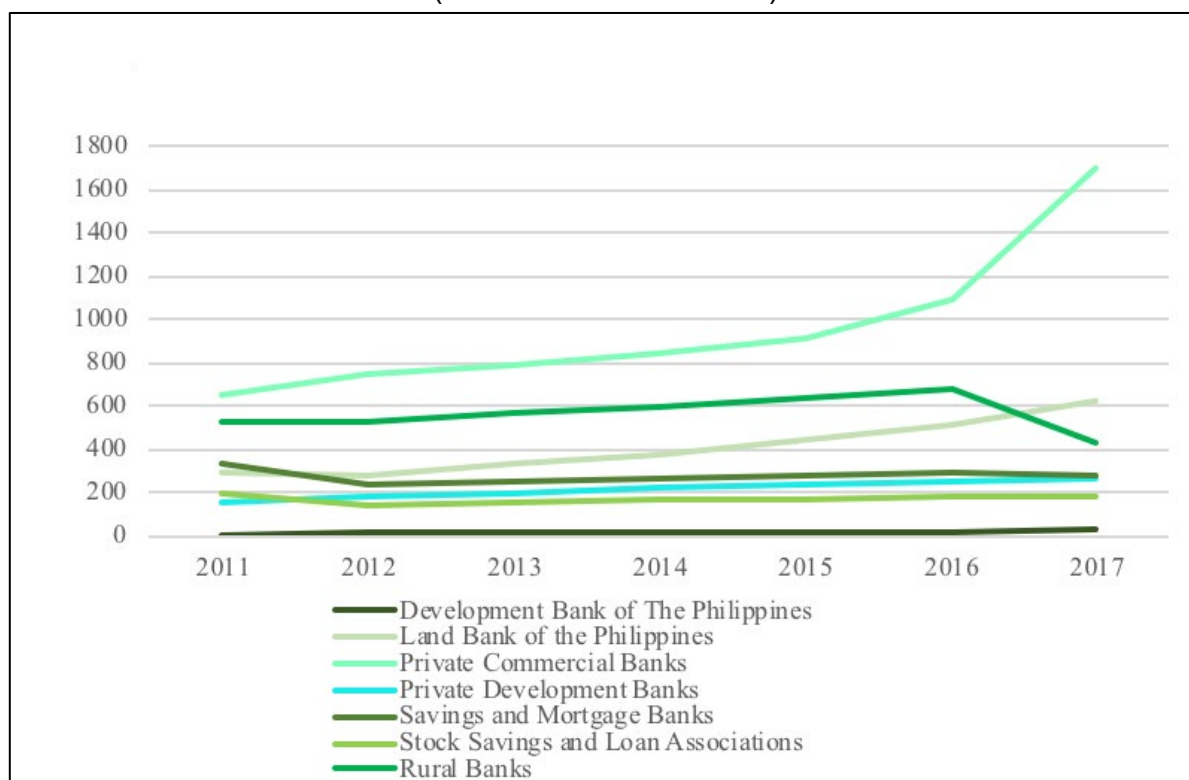
Source: Philippine Statistical Authority

**Figure 6.3: Agri-Fishery Production Loans by Category (in hundred PHP million)**



Source: Philippine Statistical Authority

**Figure 6.4: Agri-Fishery Production Loans by Institution**  
(in hundred PHP million)



Source: Philippine Statistical Authority

### Credit Facilitation Support Structure

The Agricultural Credit Policy Council (ACPC) is an attached agency of DA that develops, implements, and monitors policies concerning the flow of credit to the agricultural sector, particularly those provided by the banking sector. This includes government credit, guarantee, insurance, and capacity-building programs. Its main responsibility is to promote sustainable and effective delivery of financial services to smallholder farmers and fishers through development of agri-fishery credit policies and programs.

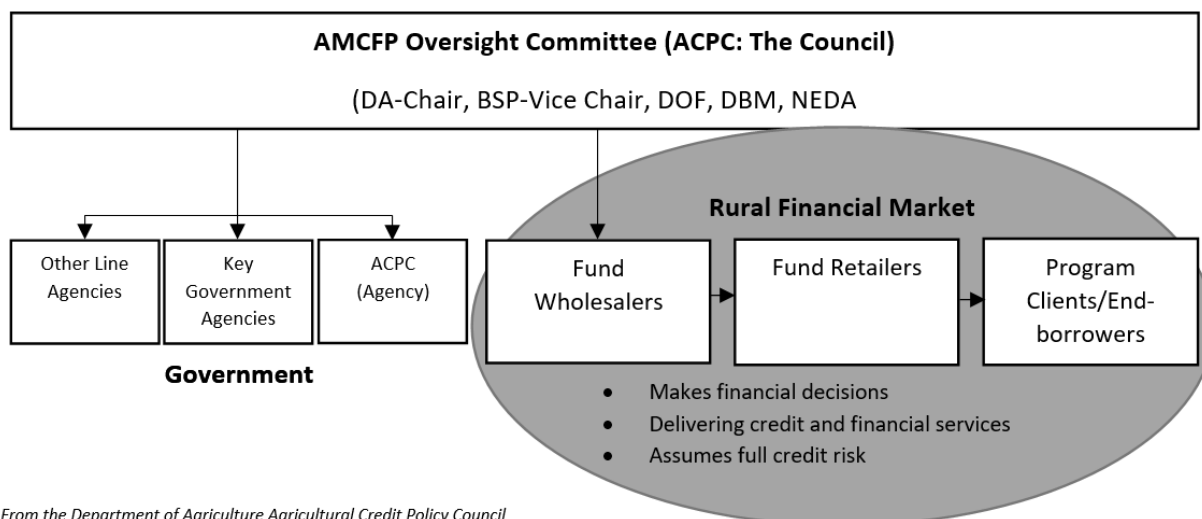
The DA-ACPC administers multiple programs in order to pursue its mission. Its main program, the Agri-Industry Modernization Credit and Financing Program (AMCFP), serves as the umbrella financing program for agriculture and fisheries of the DA. The AMCFP was established by virtue of the Agriculture and Fisheries Modernization Law (AFMA) of 1997 (RA 8435) and aims to enhance credit access of the rural poor through the implementation of a comprehensive agrarian reform credit and financing system for farmers, fishers, and small and medium enterprises (SMEs).

### Agri-Industry Modernization Credit and Financing Program (AMCFP)

The AMCFP has three key players involved in its implementation: the ACPC as the Program Oversight Committee (POC), the fund wholesalers, and the fund retailers (Figure 6.5). The POC facilitates proposed credit programs and monitors the implementation of the AMCFP. It also oversees the inflow of loanable funds and accredits qualified financial institutions as fund wholesalers of the AMCFP. On the other hand, the fund wholesalers are financial institutions that adopt regulations governing the evaluation, accreditation, and release of funds to eligible

fund retailers. Meanwhile, the fund retailers lend to the individual sub-borrowers, taking full responsibility over all financial transactions and credit decisions. These include private banks, cooperatives, and NGOs with juridical personalities.

**Figure 6.5: The AMCFP Structure**



From the Department of Agriculture Agricultural Credit Policy Council

### DA-ACPC Credit Programs

The AMCFP offers a wide range of credit facilities to the agri-fisheries sector (Table 6.1).

**Table 6.1: Credit Programs through which AMCFP Provides Loans as of March 2021**  
(excluding SURE COVID-19 Programs)

CREDIT PROGRAM	BACKGROUND	AMOUNT OF LOANS DISBURSED TO SMALLHOLDER FARMERS AND FISHERS (IN PHP)	AMOUNT OF LOANS DISBURSED TO MSES/BORROWER ORGANIZATIONS (IN PHP)
Agri-Negosyo Loan Program (ANYO) Program	Provision of a zero-interest loan program to offer working capital loans for eligible farmers and fishers' cooperatives/associations (FCAs) in the countryside to help finance the food supply chain	238,044,252	94,746,030
Kapital Access for Young Agripreneurs (KAYA) Program	Provision of the financial capital requirements of start-up or existing agri-based projects of young entrepreneurs and agri-fishery graduates aged 18-30 years old	10,462,371	418,920
Survival and Recovery (SURE) Assistance Program	Provision of support to the immediate rehabilitation of agricultural and livelihood activities of farmers and fishers in areas "under state of calamity" with considerable	413,275,270	N/A

CREDIT PROGRAM	BACKGROUND	AMOUNT OF LOANS DISBURSED TO SMALLHOLDER FARMERS AND FISHERS (IN PHP)	AMOUNT OF LOANS DISBURSED TO MSES/BORROWER ORGANIZATIONS (IN PHP)
	damage in agriculture due to natural calamities as determined by the DA and/or local government units (LGUs)		
Survival and Recovery Assistance for Rice Farmers (SURE-Aid Palay)	Provision of a one-time loan assistance to rice farmers whose incomes were affected by the drop in the farm gate prices of <i>palay</i> after the enactment of the Philippine Rice Tariffication Law	2,489,445,000	N/A
Survival and Recovery Assistance for Hog Raisers (SURE Hogs)	Provision of credit support to backyard hog raisers whose stocks were affected by the African Swine Fever (ASF)	16,243,000	N/A
BuyANlhan Program	Provision of financing to cooperatives and associations with rice farmers as members to elevate direct engagement of cooperatives and associations in the rice industry value chain	N/A	200,000,000
Expanded Rice Credit Assistance Under Rice Competitiveness Enhancement Fund (ERCA-RCEF)	Provision of financial assistance to rice farmers, which aims to help increase productivity of those who were projected to earn reduced farm income due to the proposed tariffication. ERCA is allocated with the amount of PHP1.0 billion, which is 10% of the Rice Competitiveness Enhancement Fund, as provided in the Rice Tariffication Law	489,697,302	1,181,309,046
Production Loan Easy Access (PLEA) Program	Provision to address the financial needs of marginal farmers and fishers for fast, convenient, and affordable credit for agri-fishery production especially among those in poor and remote areas that are unserved by banks	2,361,019,054	N/A
Capital Loan Easy Access (CLEA) Program	Provision of the required working capital for the marketing/trading and processing of agri-fishery products	N/A	47,903,000
Agriculture and Fisheries	Provision of financing for the acquisition of farm machinery	N/A	14,050,000

CREDIT PROGRAM	BACKGROUND	AMOUNT OF LOANS DISBURSED TO SMALLHOLDER FARMERS AND FISHERS (IN PHP)	AMOUNT OF LOANS DISBURSED TO MSSES/BORROWER ORGANIZATIONS (IN PHP)
Machineries and Equipment Loan Program (AFME)	and equipment to make farm operations more cost-effective by addressing labor intensity in land preparation, crop cultivation, and maintenance; and minimize post-harvest losses		
<i>Sikat-Saka</i> Program (SSP)	Provides financing for the <i>palay</i> production of smallholder farmers through irrigators' associations (IAs), to (1) provide the yet "unreached" <i>palay</i> and corn farmers access to timely, adequate, and affordable production credit; and (2) improve the viability of agricultural production toward the attainment of food self-sufficiency	11,823,700,000	N/A

The main credit programs of the DA-ACPC are the KAYA, ANYO, *Sikat Saka*, and APCP. The DA-ACPC administers these programs through various partner lending conduits (PLCs) and government financial institutions (GFIs) such as cooperatives, rural banks, and government banks.

### Other Agri-Fisheries Credit Programs

Aside from the credit programs administered by the DA-ACPC, additional credit and financing projects are managed by other government and financial institutions. As of December 2019, these programs are not led by the DA-ACPC; however, they are recognized as ongoing agricultural credit programs:

1. DA – Bureau of Fisheries and Aquatic Resources (DA-BFAR)
  - BFAR – Land Bank Partnership for the Promotion and Development of Mariculture Parks
2. DA – National Tobacco Administration (DA-NTA)
  - Integrated Farming and Other Income Generating Activities Project – Tobacco Contract Growing System (IFOIGAP-TCGS)
  - Integrated Farming and Other Income Generating Activities Project (IFOIGAP – Rice, Wet Season 2017)
  - Curing Barn Assistance Project
3. DA – Sugar Regulatory Administration (DA-SRA)
  - Land Bank-Sugar Regulatory Administration (LBP-SRA) Special Credit Program under the Sugarcane Industry Development Law (SCP-SIDA)
4. Land Bank of the Philippines (LBP)



- Agricultural Competitiveness Enhancement Fund (ACEF)
  - *Sulong Saka*
  - Agricultural Credit Support Project (ACSP)
  - Sustainable Aquaculture Lending Program (SALP)/*Pagsasakang Pantubig*
  - Credit Assistance Program Beneficiaries Development
  - Assistance to Restore and Install Sustainable Enterprise for Agrarian Reform Beneficiaries (ARISE-ARBs)
  - Accessible Fund for Delivery to Agrarian Reform Beneficiaries Program (AFFORD-ARBS)
5. Development Bank of the Philippines (DBP)
- Sustainable Agribusiness Financing Program
  - Sustainable Agribusiness Financing Program for the Dairy Industry (SAFP DAIRY)
  - Broiler Contract Growing Program (BCGP)
  - Tree Plantation Financing Program

**Table 6.2: Loan Programs for Farmers, Fishers, and Micro and Small Enterprises (2020)**

AGENCY/GFI	INTERMEDIARIES	NUMBER OF CREDIT PROGRAMS	ACCOMPLISHMENTS (CY 2020)	
			Amount of Loans Granted (in PHP)	Number of Borrowers/Accounts
Department of Agriculture	LBP, DBP, microfinance institutions, cooperatives	15	9.30 billion	115,827 SFF, FFOs, MSEs
Department of Agrarian Reform	LBP	2	28.10 million	11 ARBs
Land Bank of the Philippines	Cooperatives, microfinance institutions, thrift banks	17	354.57 billion	11,481 accounts
Development Bank of the Philippines	Cooperatives, microfinance institutions, thrift banks	2	13.62 billion	257 accounts

Source: From BSP 2021 NFSS presentation

According to the *Bangko Sentral ng Pilipinas* (BSP), four government institutions administer agricultural credit programs in the country: Department of Agriculture (DA), Department of Agrarian Reform (DAR), Land Bank of the Philippines (LBP), and the Development Bank of the Philippines (DBP). The institutions with the greatest number of credit programs are the DA and LBP. However, LBP granted the greatest amount of loans totaling at PHP354.57 billion to 11,481 accounts. Despite LBP granting the most loans, the institution along with other banks have been criticized regarding its non-compliance with the Agri-Agra Law.

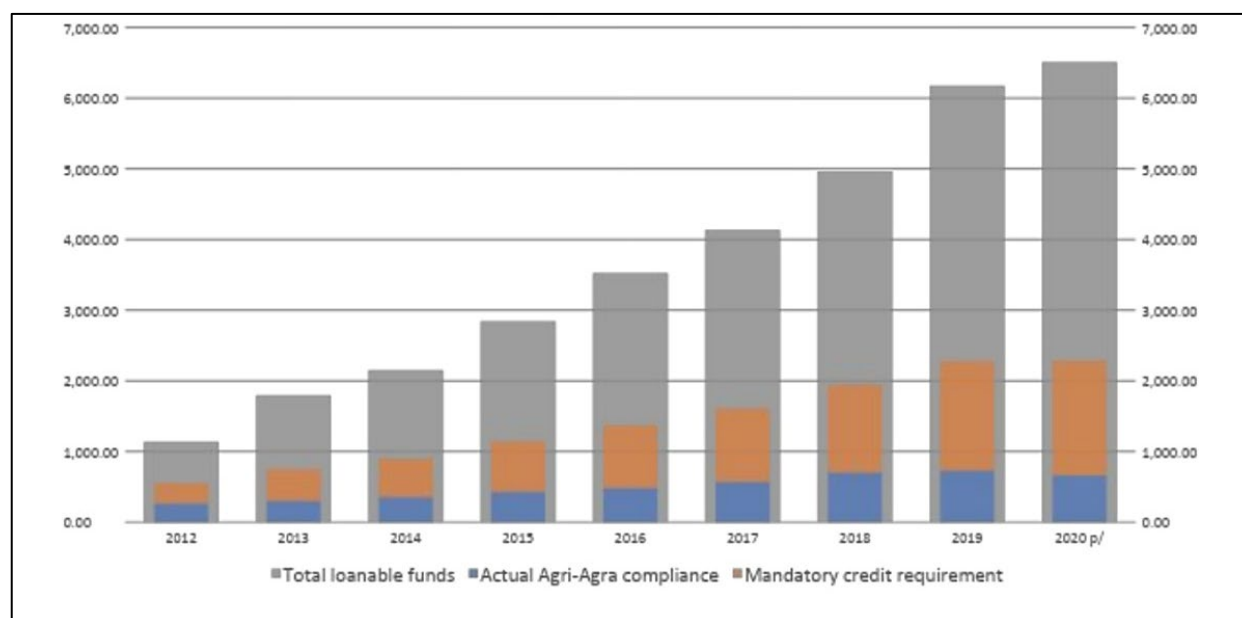
## The Agri-Agra Reform Credit Act of 2009 (RA 10000)

Republic Act 10000, otherwise known as the Agri-Agra Law, is an act that provides for an agriculture and agrarian reform credit and financing system through banking institutions. It aims to promote rural development by enhancing access of the rural agricultural sector to financial services and programs that increase market efficiency and promote modernization in the rural agricultural sector. It includes a credit quota, stating that all banking institutions should set aside at least 25% of their total loanable funds for agriculture and fisheries credit, of which at least 10% of the loanable funds shall be made available for agrarian reform projects and 15% for agriculture.

In a 2019 year-end report published by the DA-ACPC, compliance of the banking sector with the Agri-Agra Law exhibited a downward trend. The overall compliance of banks to the mandatory 25% lending quota under the Agri-Agra Law reached PHP733.9 billion, representing 11.9% of the banks' total loanable funds for the year. The overall compliance rate of 11.9% fell compared to the previous year's level of 14.3%. The downward compliance trend might indicate that some banks opted not to lend to the agricultural sector due to high perceived cost and increased risk in lending, mostly attributed to the low income brought by the low crop prices in 2019.

Rural and cooperative banks have historically shown to be compliant with the law, over-complying with a rate of 32.5%. Thrift banks under-complied with a rate of 7.7% and the same went with universal and commercial banks at 11.8%. Historically, compliance with the Agri-Agra Law has shown to be decreasing relative to total loanable funds.

**Figure 6.6: Agri-Agra Law Compliance (2012-2020, in PHP billion)**



Source: BSP 2021 NFSS presentation

This has prompted the BSP, DA, and the DAR to propose reforms to the Agri-Agra Law. In January 2021, amendments to the implementing rules and regulations (IRR) of the law have been instituted. These included deleting accreditation requirements for debt securities; expanding the modes of compliance with the agrarian reform credit; expanding agri-agra eligible purposes; amending the computation of total loanable funds of newly-established

banks; and extending loans to borrowers to finance activities identified under Section 23 of R.A. No. 8435, including *palay* housing and farming homestead.

Currently, its counterpart, Senate Bill 1924 or the proposed Rural Agricultural and Fisheries Financing Enhancement System Act, is pending at the committee level after passing House Bill No. 6134 on third reading in March 2020. The senate bill aims to establish the Agribusiness Management Capacity and the Institution-Building Fund and Program, which will be allocated PHP10 billion. Funding will come from penalties collected for non-compliance and in accordance with the credit quota set by the Agri-Agra Law. The fund is set to be managed by the Agricultural and Fisheries Finance and Capacity Building Council, supporting capacity building by rural agricultural and fisheries organizations (Tadalan, 2021).

### Credit Risk, Crop Insurance, and the PCIC

In managing agricultural credit risk, insurance and credit guarantees have been implemented to encourage smallholder farmers to avail of credit. The Agricultural Guarantee Fund Pool, which is also supported by the AMCFP, has recorded 41 partner lending institutions, 60,565 enrolled accounts, PHP4.2 billion loans, and PHP401.6 million loans guaranteed. It has a guarantee cover of up to 85% on unsecured loans. Another alternative is the Credit Surety Fund, which has a surety cover of up to 80% for loans of qualified MSME-borrowers-cooperatives from lending banks. Agricultural insurance is also available under the Philippine Crop Insurance Corporation (PCIC).

Introduced in 1981, the PCIC agricultural insurance was originally designed to serve as a surrogate collateral to lending institutions to protect lenders from credit risks and ensure stability in agricultural credit supply (Reyes and Mina, 2017). In the Philippines and a few other developing countries like Brazil, Mexico, and Indonesia, agricultural insurance is treated both as a risk management tool and as a credit risk reduction mechanism (Reyes, et al., 2015). According to the Philippine Institute of Developmental Studies (PIDS), PCIC insurance appears to be serving more as a credit risk reduction tool by design than a risk mitigation tool. This provides banks with more security and thus, more incentive to lend to farmers. Currently, the PCIC has seven major product lines—rice, corn, high-value crops (HVCs), livestock, fisheries, non-crop agricultural assets, and credit and life term insurance packages.

In 2014, PCIC started implementing the Department of Budget and Management (DBM)-funded special program named “Agricultural Insurance for Farmers and Fisherfolk Registered in the Registry System for Basic Sectors in Agriculture (RSBSA).” The RSBSA is a listing of basic sectors in agri-fisheries (i.e., those involved in crop and animal production, aquaculture, and fishing). This registry, which was assembled in 2012, covers 75 provinces in 15 regions (excluding NCR and ARMM). The PCIC mentioned that the RSBSA consists of 9,760,900 agricultural producers from the covered provinces. This special program fully subsidizes the insurance premium of all subsistence farmers and fishers registered under the RSBSA for all insurance product lines offered by the PCIC, except for the term insurance packages.

The PCIC also offers five special insurance programs under the DA: *Sikat Saka* Program (SSP), Weather-Adverse Rice Areas (WARA), High-Yield Technology Adoption (HYTA), Program for Unified Lending in Agriculture/Production Loan Easy Access (PUNLA/PLEA), and Yolanda Rehabilitation and Recovery Program (YRRP).

### Weather Index-Based Insurance Services

In the same year, the pilot testing of the Weather Index-Based Crop Insurance (WIBCI) was launched in as a sub-component 2.3 of the Philippine Climate Change Adaptation Project (PhilCCAP) (Quilang, 2014, as cited by Reyes et al., 2015). The PhilCCAP is a World Bank-funded project initiated by the DA. The WIBCI scheme utilizes automatic weather stations and

manual rain gauges in measuring rainfall at various crop growth stages. Within a pre-defined radius of each weather station, weather patterns should be relatively similar. Also, farmers around each weather station should be well-trained and educated about the program (Reyes et al., 2015).

Claims settlement for the WIBCI scheme is more convenient for farmers due to rainfall measurements being made in common weather stations. As such, this scheme is attributed with low administrative costs, fast claims settlements, and improved transparency. However, the implementation of the WIBCI scheme still possesses issues and challenges. The insured farmer cannot file for indemnity claims if losses are brought by causes other than excessive and insufficient rainfall, or if the extreme weather event was not recorded at the weather station. Farmers, as well as other stakeholders, must be educated and trained regarding this insurance design as it is very different from the traditional multi-peril crop insurance scheme (Reyes et al., 2015).

Despite its challenges, the WIBCI insurance scheme is a good step toward risk management in the Philippine agri-fisheries industry. However, pending issues such as the intent of Philippine crop insurance as a credit risk reduction tool should be resolved through administrative policies in order to effectively implement the WIBCI scheme. The DA and the PCIC should collaborate further to advance the Philippine agri-fisheries credit and financing system and to protect local farmers and fishers from future risks.

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## CHAPTER 7

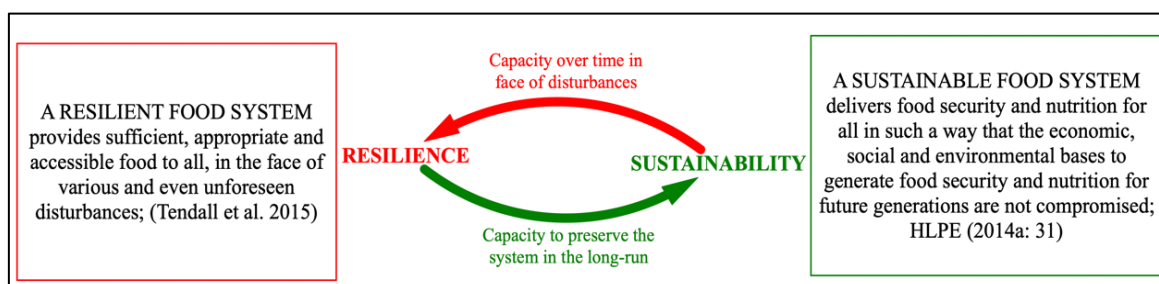
# Resilience and Sustainability of the Agri-Fisheries Sector<sup>25</sup>

### Toward a Common Understanding of Sector Resilience and Sustainability

**R**esilience and sustainability are complementary concepts since they both target sustainable development. Resilience refers to “the capacity of a system to deal with change, withstand shocks and disturbances, and continue to develop”, while sustainability is defined broadly as “the capacity to achieve today’s goal without compromising the ability of future generations to achieve them.”

Initially, sustainability rapidly gained popularity when the concept of sustainable development was introduced in 1987 and up to present, and still is the central objective of many global initiatives, most notably the United Nations’ 17 Sustainable Development Goals (SDGs). Increasingly, the concept of resilience is introduced to enrich the idea of sustainability and to spur transformative pathways to more sustainable systems. Sustainability and resilience need to complement and work together to deliver food and nutrition security for present and future generations (Figure 7.1). Sustainable practices contribute to resilience, and both are the ultimate goals of a healthy society.

**Figure 7.1: Resilience and Sustainability Conceptual Definitions in the Context of Agri-Fishery and Food Systems**



Bringing resilience into agri-fisheries must be understood in the context of ambition for the sector: to ensure that the agriculture and fisheries have the ability to prepare for, withstand, and recover from the shocks and stresses. The Department of Agriculture’s leadership catch-phrase “*Masaganang Ani at Mataas na Kita*” through the “New Thinking for Agriculture” has laid the sector’s vision toward “*a food secure and resilient Philippines with empowered and prosperous farmers and fishers.*”

We have far less understanding, however, of how to build a sustainable and resilient sector that can anticipate and better manage different types of shocks and stresses and become even better off. At the global landscape, food system solutions are increasingly

<sup>25</sup>Prepared by Jacquelyn F. Escarcha, PhD, Agriculture Resilience Specialist, FAO; with Dr. Patricia Ann J. Sanchez, SEARCA Sustainable Land Management Expert



recognized at the nexus of agriculture resilience, food and nutrition security, and environmental sustainability, among others. Food system resilience is defined as the “capacity over time of a food system and its units at multiple levels, to provide sufficient, appropriate and accessible food for all, in the face of various and even unforeseen disturbances.”

Building resilience is a process of ensuring continuity from farm to table. Food systems perspective considers a variety of possible interrelated shocks and stressors across scales consisting of environmental, economic, social, and institutional (Table 7.1).

**Table 7.1: Common Shocks, Stressors, and Vulnerabilities Affecting Resilience and Sustainability of Agriculture and Fishery Sector**

	<b>ENVIRONMENTAL</b>	<b>ECONOMIC</b>	<b>SOCIAL (INCL. HEALTH)</b>	<b>INSTITUTIONAL</b>
<p>Shocks <i>A shock is defined as a ‘sudden event that impacts on the vulnerability of a system and its components’. In case of slow onset hazards is ‘when the event passes its tipping point and becomes an extreme event.’</i></p>	<ul style="list-style-type: none"> <li>• Extreme weather events/ Climate Disasters (El Niño, La Niña, Typhoons, Monsoon Rains)</li> <li>• Natural disasters (earthquakes, volcanic eruptions)</li> <li>• Pest and Disease Outbreaks (African Swine Fever (ASF), Fall Armyworm, Fish kills)</li> </ul>	<ul style="list-style-type: none"> <li>• Food price shocks</li> <li>• Price drops for agri-fishery outputs</li> <li>• Spikes in prices of production inputs</li> <li>• Trade disruption</li> <li>• Financial market shocks</li> </ul>	<ul style="list-style-type: none"> <li>• COVID-19 food momentary panic buying</li> <li>• Sudden changes to on-farm operations (pandemic - induced)</li> <li>• Human health crisis, Emerging pandemics</li> </ul>	<ul style="list-style-type: none"> <li>• Sudden changes in access to input/output markets</li> <li>• COVID-19 restrictions on travel and movements</li> <li>• Prolonged COVID-19 pandemic</li> </ul>
<p>Stresses <i>A stress is a “long-term trend that undermines the potential of a given system and increases the vulnerability of actor within it”;</i> (DFID, 2011 – <i>Defining Disaster Resilience: a DFID approach paper</i>)</p>	<ul style="list-style-type: none"> <li>• Climate Change (global warming, sea level rise)</li> <li>• Soil erosion/ degradation</li> <li>• Declining agricultural land</li> <li>• Pollution/ destruction of coastal and marine resources</li> <li>• Biodiversity losses</li> </ul>	<ul style="list-style-type: none"> <li>• Competition on resources (water)</li> <li>• Increased cost of production (labor, energy)</li> <li>• High start-up costs for agri/farming business</li> <li>• Poor global competitiveness/ Liberalized market</li> </ul>	<ul style="list-style-type: none"> <li>• Changing dietary preferences</li> <li>• Land Reform/ ownership issues</li> <li>• Small farmers and fishers poor access to social/information and capacity building services</li> <li>• Rural farmers remoteness/ less developed infrastructures (farm to market roads, ICTs)</li> <li>• Ageing farm labor force</li> <li>• Declining interest in the sector among Filipino youth</li> </ul>	<ul style="list-style-type: none"> <li>• Government support to the sector (national)</li> <li>• Resource use regulations (land tenure, environment)</li> <li>• Production restrictive/ global trade control policies</li> <li>• Conflicts and displacements</li> <li>• Decreasing transparency (in value chains, governance)</li> <li>• Political instabilities</li> </ul>

The state of the food and nutrition security at the local levels is the result of two reinforcing issues: the lack of capacity to respond and recover rapidly from the impacts of persistent *shocks and stressors*; and the *structural conditions* of our small-scale farmers and fishers that are operating under difficult environments. In building resilience, it is crucial to understand the risks posed by these shocks and stresses, and to recognize the vulnerabilities and adaptation capacities of stakeholders. Historically, the sector has always dealt with shocks and stresses, particularly climate and natural disasters due to its economic characteristics and geographical circumstances. Climate change and disasters are key underlying causes of decrease in production, and the impact is substantial since high productivity

growth has been a key driver of structural transformation promoting long-term economic growth. Climate change disrupts crop productivity while disasters cause serious crop failures, and in turn affect domestic food supply, consumption, and food systems functions.

Climate change is recognized as a long-term stressor that exacerbates existing risks to the agriculture sector. By DA's estimates, the agriculture sector absorbed an average of 27% of the economic impacts from natural hazards from 1995-2013 (look for a more recent figure). From 1990 to 2016, damages to agricultural production were caused by typhoons (70%), droughts (18%) and floods (5%) (CRA Philippine Profile). The Philippines consistently ranks high on most of the reputable global indices for vulnerability to climate change; it ranked fourth among the most climate-affected countries (out of 180 countries) in the Long-Term Climate Risk Index (Eckstein et al., 2021) in the 20-year period from 2000 to 2019 (annual averages), and ninth among countries with the highest Disaster Risk Index according to the World Risk Report of 2020. In the coming years, these climate shocks are evolving and becoming more frequent or intense, such as extreme weather events. A recent manifestation was the triple hit in 2020 from typhoons Quinta, Rolly and Ulysses in quick succession, causing the worst floods with a combined damages and losses to the sector of Php12.4 billion per DA estimate.

A worsening climate change scenario is also predicted. Over a 60-year period (1951-2010), the temperature trend for the country demonstrates an increase of 0.65°C in annual mean temperatures. PAGASA projects that all areas in the Philippines are expected to get warmer in the short- (2020) and medium-term (2050), with more intense heat and less rainfall during the summer months. This warming is anticipated to worsen tropical cyclone intensity, cause more frequent and intense droughts, and extreme rainfall events. The increase in water and heat stress impacts the agriculture production systems where there is anticipated decrease in crop yields, increased incidence of pests and diseases in crops and livestock, and shift crop production suitability among others. A study projected a total welfare loss to the Philippines of US\$16.72 billion over the 40-year period (in 2050), or a net economic welfare loss to the agricultural sector due to climate change of Php 18.81 billion per year (Rosegrant et al., 2016).

Moreover, climate change will affect the fisheries over a long period of time. A recent study projected the climate change impacts on marine capture fisheries in the Philippines to cause a decrease by about nine percent of fisheries GDP with the mitigation scenario and about 18%

### **RESILIENCE can be understood as:**

**Resistance** = capacity to **withstand or absorb** sudden or chronic shock

**Preparedness** = capacity to **cope** with temporary disruption while **minimizing** the damages and costs from hazard

**Recovery** = capacity to **restore or bounce back** after an event

**Adaptation** = capacity to **manage or maintain** basic functions and structures to become suitable for future situation

**Transformation** = capacity to **create opportunities to change** the abilities to take advantage of an adverse situation

\* John Twigg, 2009 - Characteristics of a Disaster-resilient Community

of GDP with the extreme scenario up to 2060 (Suh and Pomeroy, 2020). The decrease in contribution of marine capture to GDP leads to the decrease in income of fishermen, particularly in rural areas where most fishers are concentrated. Three out of four poor Filipinos live in rural areas, including growing peri-urban areas, and most of them depend on agri-fishery-based activities, which is often affected by disasters and climate change.

While climate change impacts the entire agri-fishery sector, small farmers and fishers are extremely vulnerable and face numerous climate risks that amplify the costs and challenges of development. Developing inclusive agricultural adaptation and growth strategies, including policies and practice of disaster risk reduction and management to thrive under climate change conditions, is of utmost importance. At the same time, new shocks may emerge, such as novel threats to human, crops, and animal health; and others that are still unprecedented and uncharted. For instance, the events of the COVID-19 crisis put forward the critical components of food systems, particularly keeping food production and supply chains functioning. The global COVID-19 pandemic has reiterated the fact that local vulnerabilities are systemic and that local risks are interconnected.

It is therefore important to enhance the resilience of the most vulnerable against different types of shocks and stresses. Before COVID-19, the sector's resilience is often viewed in relation to climate change and its impacts in the context in which it operates. Building food system resilience requires transformation from a food production-supply centered sector to a whole of a system approach that explicitly ties an integrative perspective to maintain its functions. Transformability is the capacity to significantly change the internal structure and feedback mechanisms of the sector to take advantage of an adverse situation.

Transforming the agri-fishery sector is not just about safeguarding our environment for the future, but it is essential post-pandemic. The COVID-19 crisis offers an opportunity to build back better in transition to a “new normal”—putting agri-fishery at the forefront of recovery and structural transformation toward an agri-fisheries-driven economy, promoting food and nutrition security, and long-term economic growth. Simply put, resilience means the capacity of the sector not only to bounce back from shocks and adapt, but also learning and innovating to get ahead of them. Looking ahead, a sustainable and resilient agri-fishery sector will be the main engine of change and growth in the coming decades.

### Lessons Learned from AFMP 2011-2017 and 2018-2023

The **Agriculture and Fisheries Modernization Act of 1997** (AFMA, Republic Act 8435) embodied legislative efforts for policy and support measures guiding the Philippine agri-fishery sector. AFMA's underlying principle is to help farmers and fishers realize better income beyond increasing their productivity by enhancing market competitiveness. It laid down several reforms aimed primarily at modernizing the agriculture and fisheries sector, through the formulation of the **Agricultural and Fisheries Modernization Plan** (AFMP) per mandate of the Department of Agriculture. The AFMA has been broadly continued in subsequent development plans and policy measures for the sector. The first AFMP was for 2001-2004, the second AFMP was for 2011- 2017, and the third is the AFMP for 2018- 2023.

At the outset, the agri-fishery development in our country recognized the concept of environmentally sustainable agricultural growth; thus, in AFMA, it is declared that the State should *“promote development that is compatible with the preservation of the ecosystem in areas where agriculture and fisheries activities are carried out [and] ... exert care and judicious use of the country's natural resources in order to attain long-term sustainability.”*

Lessons from the past AFMA's policy implementation that heavily focused on production and increasing competitiveness reflect that such policy will not be sustainable and is not enough to achieve inclusive growth for the sector. Although the premise of AFMP 2001-2004 included sustainable development through environmental protection and conservation, it provides limited consideration of the resilience component particularly on climate issues. For instance, on account of sustainability, AFMA requires identification of Strategic Agricultural and Fisheries Development Zones (SAFDZ), which serve as the key implementation tools to prioritize agricultural development in predefined areas for agricultural and fishery production. Under SAFDZ, the lands devoted to agricultural production are optimized without causing irreversible environmental problems. This zoning of agricultural land ensures inclusive and sustainable growth by assigning areas that are environmentally and culturally sound with consultation to various stakeholders. The approach is participatory, but the identification of zones revealed a low satisfaction of 40% from stakeholders' survey, citing the flawed process of delineating the SAFDZ as major reason for its non-implementation as the focal point for agri-fishery sector development (Aquino et al., 2014).

Moreover, the subsequent AFMP 2011-2017 adopted a value chain development approach and it mainstreamed climate change concerns. The AFMP 2018-2023 further integrated climate change adaptation and disaster risk reduction and management in its goals and strategies. The AFMP 2011-2017 commenced planning for the institutionalization of "climate change-proof" functional plans, and the progressive capacity building of the sector to be equipped with knowledge and skills on climate change and the technologies that promote resilience. This is in due recognition that the agriculture and fisheries sector absorb the brunt of natural disasters, above all climate change impacts; which continue to exert increasing pressure upon the sector. After the devastation of typhoon "Ondoy" in 2009, the national government has stepped up efforts to include mainstreaming, mitigation of, and adaptation to climate change both in strategic and operational levels in various agencies across the sector through the establishment of Climate Change Commission (CCC). For example, legislators passed two laws, the Climate Change Act of 2009 and the Philippine Disaster Risk Reduction and Management Act of 2010. For the first time in 2011, the approval of the National Climate Change Action Plan (NCCAP) shifted the government's strategy from response to preparation in the agriculture sector, and put forth substantial effort to communicate the development pathway of the country amidst climate change, which prioritizes food security, water sufficiency, ecological and environmental stability, among others.

The DA's efforts into mainstreaming Climate Change Adaptation (CCA) and Disaster Risks Reduction (DRR) in agriculture was fully realized when the program on Adaptation and Mitigation Initiative in Agriculture (AMIA) was established in 2014 (Figure 7.2). AMIA is a mainstreaming and communication strategy that focuses on two actions that can be done toward climate change, namely, *adaptation which allows for an easy bounce-back and mitigation to reduce the emission of greenhouse gas*. It is also a multi-sectoral partnership and allows the country to have a resilient yet progressive agricultural and fisheries livelihoods.

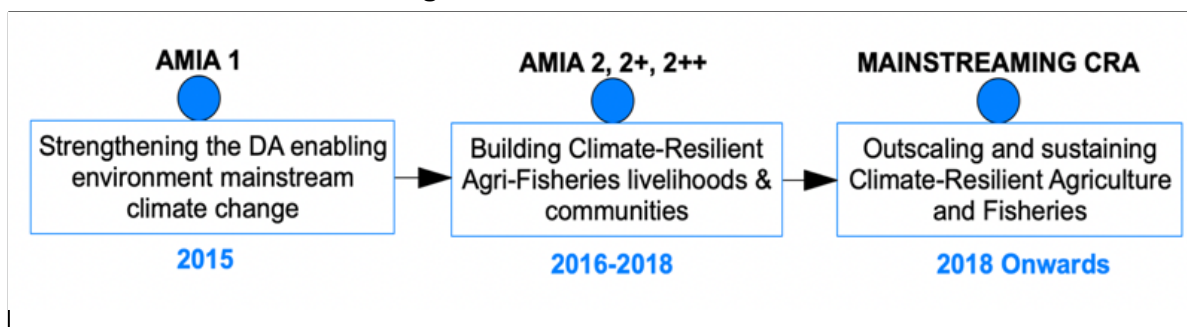
**The DA-AMIA Program is anchored on four strategic objectives for a climate change compliant or climate-proof DA plans and programs:**

1. **Increase the adaptive capacity and productivity potentials** of agriculture and fisheries livelihood, modifying commodity combinations to better meet weather issues and natural resource endowments
2. **Redefine the SAFDZ** including climate change vulnerabilities as part of mapping variables,
3. **Redefine Agricultural Development Planning Framework** as the basis for agricultural planning by including key factors/variables associated with Climate Change, and

4. Develop a new framework and plan for the provision of “new” government agricultural services toward the **accelerated development of Climate Smart Agriculture and Fisheries Industries.**

The AMIA ensured that agricultural policies and programs contribute to reducing climate risks and vulnerabilities, but no overarching response to climate imperatives has emerged. The linkage between DA-wide departmental policies and system-wide climate change programs is weak. Except for the Rice Program, all other programs make no reference to NCCAP priorities, and the implementation of climate-responsive actions suffers from a lack of coordination between national, sectoral, and local authorities (World Bank, 2020).

**Figure 7.2: AMIA’s Milestones**



Source: DA

The previous AFMP iteration has placed the increased resilience of agri-fishery communities to economic, human-induced, and natural risks as a desired long-term impact. It identified “increased adaptive capacities of farming and fishing communities and resilience of natural ecosystems” as one of three major sub-outcomes.

Likewise, the AMIA program propels multiple Sustainable Development Goals (SDGs) (identified in Figure 7.3) using a pragmatic approach and responsive support services for better impact. The agriculture and fisheries sector is at the heart of the SDGs, and SDG 13 (Climate Action) is linked through targets to eight other SDGs: No Poverty (1), Zero Hunger (2), Gender Equality (5), Economic Growth and Employment (8), Reduced Inequality (10), Responsible Production and Consumption (12), Marine and Terrestrial Ecosystems (14 and 15, respectively).

**Figure 7.3: The Multiple SDGs linked to AMIA’s Program** (source: DA)



The more recent AFMP 2018-2023 obtained most of its inputs from the Philippine Development Plan (PDP) for 2011-2016, with new objectives having been added such as improving the



sector's resilience to risks, including climate change. The plan further elaborated five sub-outcomes as advocated by stakeholders: (1) improved decision-making through access to and utilization of reliable and timely scientific and risk-based environmental, social, and economic information; (2) increased access to adaptive technologies and adoption of climate resilient and sustainable agri-fishery practices; (3) increased access to social protection, risk transfer, and financial services; (4) diversified income base of farmers and fishers; and (5) improved adaptive capacities of supporting institutions and ability to respond and deliver services, including in times of calamities.

The AMIA program currently consists of seven system-wide mainstreaming programs:

1. Mainstreaming CCA and mitigation initiatives in agriculture
2. Climate Information System (CIS)
3. Philippine Adaptation and Mitigation in Agriculture Knowledge Toolbox
4. Climate-Smart Agriculture Infrastructure
5. Financing and Risk Transfer Instruments on Climate Change
6. Climate-Smart Agriculture and Fisheries Regulations
7. Climate-Smart Agriculture Extension System

The AMIA also developed landscape planning guidelines for agriculture and fisheries in partnership with planning officers. This is the new paradigm in planning that AMIA aims for the department to adopt. Landscape planning is already included in the Agriculture and Fisheries Modernization Plan (AFMP), which envisages DA to “plan using landscape as a planning domain.”

The Philippine agriculture and fisheries sector, under the leadership of DA, cuts across policy instruments and agencies to better implement the country's agriculture and fisheries modernization programs. The DA AMIA teams are now present in all of the department's offices and bureaus.

Success factors in terms of DRR-CAA capacities are the following:

- The Philippines in general enjoys a robust and steadily improving climate information system (CIS), which includes not only weather and climate monitoring, prediction, and advisories, but also climate change projects, through the leadership of the DOST-PAGASA. PAGASA's Climatology and Agrometeorology Division produces data and information for agriculture, in close cooperation with the DA, through its AGRI-WEATHER module that provides updated climate information and impact assessment for agriculture. This service is accessible on the PAGASA website. It offers climate information for agriculture sub-modules on farm weather forecasts, 10-day regional agri-weather information, and monthly agri-climatic review and outlook. The agency also produces *Impact Assessment for Agriculture* monthly bulletin, which provides users, such as food security managers, economic policy makers, agricultural statisticians, and agricultural extension officials with qualitative information on the current and potential effects of climate and weather variability on rainfed crops, particularly rice and corn.
- DA also established a System-Wide Climate Change Office (DA SWCCO) in 2013 to coordinate the mainstreaming of climate change concerns, to lead the implementation of adaptation actions, and represent the country in national and international climate processes. The DA has been working toward the institutionalization of SWCCO (DA Memorandum Circular No. 04 series of 2020), renamed as Climate Resilient Agriculture (CRA) office, in line with its Agency-wide Rationalization order (A.O. No. 01, Series of 2020).
- The DA has developed a Strategic Plan of Action for Disaster Risk Reduction in Agriculture and Fisheries. The Plan mainstreams disaster risk reduction and management in the agency's work.



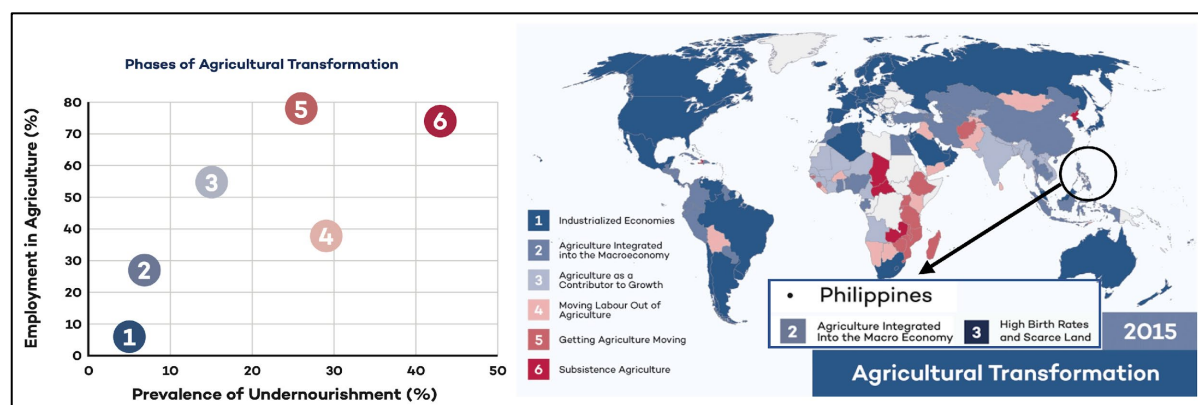
- To provide comprehensive climate information services to the agriculture sector, DA has also recently developed AMIA maps—color-coded, portraying integrated crop suitability, poverty, hazards, and climate change impact. The maps can identify agriculture and fishery areas exposed to climate risks and hazards; and are useful guides for short and long term planning, for investments and for tailor-fit support services.
- Further, DA is active in pursuing climate resilient regulations to build resilience across stakeholders. The department created a regulatory system to foster adaptation and climate change resiliency among stakeholder members. An extension system additionally enhances the quality of climate field schools and training of the trainers. Climate change was added in the curriculum of the training for trainers.

## Potentials and Constraints toward Resilient and Sustainable Sector Transformation

### Transformation Context

In the context of agricultural transformation, a key research finding of the International Food Policy Research Institute (IFPRI) and the International Institute for Sustainable Development (IISD) shows that Philippine agri-fisheries is yet to be transformed, from a phase (2) where agri-fisheries is integrated into the macroeconomy, and gearing toward agri-industrialization (Figure 7.4). The analytical framework of the research starts with a global cluster analysis to define six non-linear phases of agricultural transformation for 117 countries over 45 years, using two indicators: (1) an indicator of the resources allocated to agri-fisheries: the share of agricultural employment in total employment; and (2) and a food security outcome indicator: the prevalence of undernourishment (Laborde, 2018).

**Figure 7.4: The Philippines in a Non-Linear Agriculture Transformation Path\***



\*Mapped from over a 45-year period analytical framework with global cluster analysis, which assesses the level of agricultural transformation by using data on the prevalence of undernourishment and the share of agricultural employment

While only a few countries have successfully achieved industrialized economies, the potential for agricultural transformation is there. The country presented a strong economic growth prior to the pandemic with a sustained economic growth rate of 6.4% from 2010 to 2019. However, the agri-fishery sector growth was stagnant during 2010 to 2018, with annual growth averaging 1.3%. This was lower compared to those of Indonesia (3.9%), Vietnam (2.7%), and Cambodia (2.0%) (ADB, 2019).

Agri-fisheries transformation starts with modernizing the sector to ensure food security and nutrition, along with the critical role it plays in structural transformation of rural economies. Implicitly, the combination of resource allocation and food and nutrition security dimensions

describe the efficiency and inclusiveness of the sector transformation process. The context of Philippine agri-fisheries transformation was clustered under high birth rates and scarce land. This means added challenges for the sector to transform under the shrinking agricultural resource, the declining productivity of its resource base, and the worsening environmental impacts.

With the COVID-19 pandemic from 2020, the sector has demonstrated its resilience by keeping the food supply functioning. But hunger and malnutrition persist and could continue to worsen. Transforming agri-fisheries beyond the current COVID-19 crisis offers an opportunity to build back better toward a sustainable and resilient sector. In doing so, the sector needs to take a new path for it to address the other recurrent stressors particularly the loss of jobs and livelihoods due to the pandemic; and environmental sustainability, among others.

### ***Climate Change as Constraint Toward Sector Transformation***

The changing climate will reshape the agriculture and fisheries physical production constraints. Climate change ranks highly among threats to the ability of food supply systems to meet growing demand through 2050 by depressing the productivity of major crops and causing serious disruptions in agricultural supply (D Leclère et al., 2014). Impacts related to climate change are evident across key agri-food producing regions in the country, which are increasingly disruptive.

As climate change worsens, dangerous weather events are becoming more frequent or severe. The increasing temperature trend and sea-level rise, disruption of rainfall patterns, and the intensification of weather extremes will alter sector constraints over time, particularly with respect to land-use possibilities. Climate change disrupts the potential agricultural productivity relying on biophysical characteristics (e.g., fertility and quality) of land suitable for farming. In addition, the availability and fertility of agricultural land, as they interplay with the population dynamics, are core to the role of agri-fisheries in economic transformation.

Climate change also matters to the fisheries sector and marine ecosystem. The impacts on fisheries manifest at multiple spatial scales in coastal fishing communities. For instance, the rising sea level constrains productive coral reef ecosystems and the fish communities that depend on them. Meanwhile, droughts, floods, and unpredictable rainfall impact the oxygen levels of different bodies of water for inland fisheries and cause fish pond overflows.

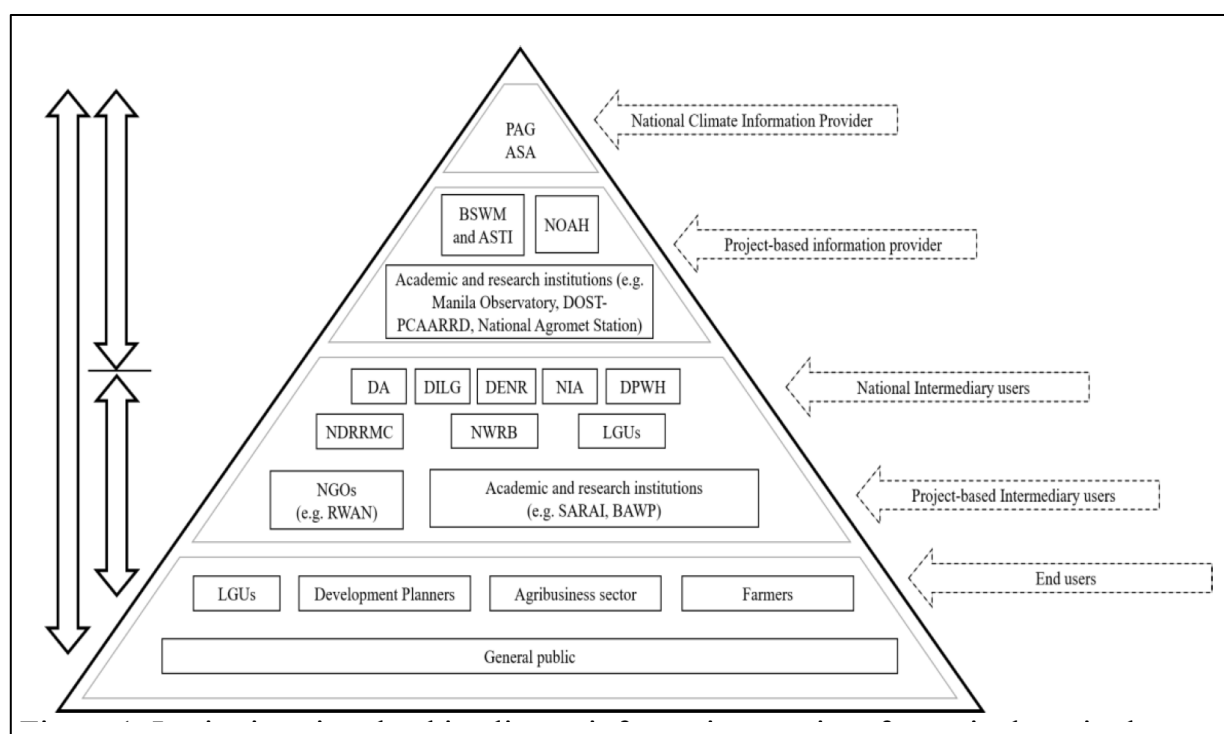
Under a changing climate, the sector needs to generate more from less toward a resilient and sustainable transformation. This means increasing agricultural productivity given scarce land and dwindling agri-fisheries resource base. Communicating climate information relevant to the sector and local needs and priorities necessitates for a common understanding on resource limitations. More agricultural outputs have to come from less intermediate inputs and less environmental cost through the Climate Resilient Agriculture program that DA has started. In order to move toward transformation, the sector's potential to adapt has to factor in using the piloted climate smart and resilient agricultural practices that adhere to the principles of both adaptation to climate change and sustainable maintenance or increase of agricultural productivity, and mitigation of GHG emissions from agriculture.

Harmonization of climate change adaptation activities (CCA) needs to be reflected across the sector's development plans. Agriculture and fisheries production must realize the potential for more economic value through inclusive priority commodity road maps that address CCA across all value chain segments. For example, most CCAs are highly focused on production or on-farm systems, yet differentiated adaptation is needed for fisheries, livestock, and crops post-harvest requiring context-based dedicated CCA programs. The transformation toward a resilient and sustainable sector can rely on value-addition with increased efficiency, innovation, and less environmental impact. The sector has the opportunity to remain ahead of the race

against climate change with the ongoing process of learning, restructuring of the expected changes in the roles and spending patterns of the local governments, and proactive policies in the sector and core institutions servicing agri-fisheries.

Usability of available Climate Information Services (CIS). The agri-fishery sector benefits from various climate information providers as mandated by several national laws, through the coordination of government institutions or linkage among relevant stakeholders (Figure 7.5). Given the reliance of farmers and fishers on timely and accurate data, generation of climate products that are user-centered (tailored to the specific needs of farmers) and reliable in decision making is a critical concern. Often, the demand is for more localized climate information (or downscaled climate forecasting and projections) at different timescales. CIS providers are challenged to transform climate data into real time and more useful local farm management advisories.

**Figure 7.5: Institutions Involved in Climate Information Services for Agri-Fisheries in the Philippines (Elazequi et al., 2017)**



CIS should translate information into impact-based forecasting. The established institutional mechanism among CIS providers should make climate information more relevant in local-level decision making, actual farming activities, and in response and transformation strategies. The sector lacks impact-based forecasting to guide in decision making which restricts the effectiveness of options to achieve vulnerability outcomes and disaster risk reduction. For example, raw climate information such as rainfall and temperature must be clearly translated into impacts on specific farming systems (e.g., crops, aquaculture, etc.) and farmers' livelihoods. Climate variability must be included with useful impact-projections and predictions to guide the farmers and decision makers to respond to potential effects, e.g., *La Niña*, *El Niño*, current drought/flood conditions.

The accessibility for wider-scope yet local scale delivery of CIS is also a key challenge. There are still areas that need priority for weather observation stations, especially key producing-/or potential regions that are sensitive to change, highly vulnerable, with poor historical records,

and lacking in spatial and temporal resolutions. The fisheries sector, in particular, is “data-poor,” especially in terms of quantitative and predictive approach that considers climate change parameters to account for the status of marine resources. A national assessment of vulnerability to climate change for fisheries has not been undertaken aside from the site-specific studies providing evidence of the impact of climate change on fisheries. Moreover, an assessment should be continuously and periodically carried out, and it is necessary that data or research materials should be open to the public to help make more informed fisheries management decisions particularly on incorporating climate change impacts into fisheries development plans and climate adaptation into the fisheries management plan.

The sustained dissemination of climate information is highly dependent on the political support and local priorities (e.g., budget allocation, local capacities). The non-integration of climate-related information into public decision-making poses threats to the fishery sector adaptation, and adds to the uncertainty about the future amidst climate change. Finally, the uncertainties concerning climate variabilities and changes and agri-environmental degradation are seldom systematically included in most impact and adaptation assessments, further limiting local adaptation and public sector resourcefulness and actions. Uncertainties inflate the potential need for transformational adaptations and will help mitigate anticipated losses.

### ***Agri-Fishery-Environmental Stressors Constraining Sector Productivity***

Reliable hotspot (both environmental and climate change) maps in the Philippines are lacking, and this limits the prioritization of corridors. Environmental corridors are areas in the landscape that contain and connect lifelines of the natural resource base. Climate-wise connectivity focuses on preparing and restoring resilient landscapes for climate change calls. In such a context, knowing where and when transformations could be required, and their robustness over time, is challenging especially when the country has a limited natural resource base. Environmental degradation threatens the intended yield and constrains the realization of the agricultural productivity targets, with impacts likely to affect poorer communities more.

The structural endowments of a country, such as the land, water, and soils influence the sector’s transformation process. For example, the very pronounced land degradation resulting to 30-50% reduction in soil fertility (about 17% out of 5.2 million hectares total land area are severely eroded and 27.3% vulnerable to drought) (Naz, 2013). The country loses an average of 457 metric tons of soil per year to erosion (BSWM estimate, 2015). Land degradation is easily equated to food insecurity and poverty because of its significant impacts on declining farm productivity and increasing economic environmental costs. Since the National Action Plan (NAP) in 2004, soil degradation has been identified as a major environmental concern (Asio et al., 2009) and a major agricultural issue that is becoming rampant particularly on upland farming areas.

Non-climate factors, such as deteriorating environmental quality and unsustainable development practices, aggravate climate vulnerability. Problems of water quality and availability due to deforestation in watershed areas have significant impacts on adaptive capacity of the sector. The current water distribution system remains inadequate to deal with climate change especially during rain surges and droughts, which impact the availability of irrigation water. The inefficient use of water resources in agriculture linked to the prevalent type of irrigation and water payment system intensifies farmers’ vulnerability to climate change. Despite the abundance of water in the country, water supply has become a scarce commodity in some areas at certain seasons. Thus, emphasis on water security and proper allocation and management of water is imperative.

Biodiversity degradation is also a pressing issue as it is interlinked with unsustainable practices. Loss in biodiversity coupled with environmental stress (results in increased pathogenicity by mutations) has a cascading impact on the increased incidence of pests and

diseases and heightens the likelihood and likely impact of future infectious diseases in livestock. Likewise, biodiversity loss results in loss of natural predators (biological pest control) in crops. Poor ocean health, transformation of mangrove swamps, and destruction of coral reefs all point to significant loss of biodiversity leading to potentially more damaging further impacts on marine resources and fisheries sector productivity (changes in fish abundance and location). Sustainability remains one of the most urgent challenges facing the fisheries sector in the country.

While the COVID-19-induced lockdowns led to the reported global environmental improvements (sudden reduction of both GHG emissions and air pollutants),<sup>26</sup> the declines in local environmental quality, including air and water pollution, exacerbates vulnerability both to disease (COVID-19) and to the effects of climate change. If economic activity resumes as before, such reduced emissions of GHGs and air pollutants and less water pollution are likely to be temporary and have almost no long-term impact. The GHG emissions will likely rebound and resume to the increasing trend post pandemic, underlining the reasons that environmental issues are top priority around the world.

Farmers' and fishers' vulnerability to adverse shocks from climate change is amplified by poverty (a constraining factor to sector transformation). The physical impacts of climate change can reduce economic growth and make it more difficult to sustainably lift Filipinos who are at the margin of subsistence out of poverty. While declining or stagnant agricultural productivity are among the causes of rural poverty in the country, almost a quarter of the population remains vulnerable to falling into absolute poverty in the event of natural disasters or deterioration in economic conditions. Many of these people are disproportionately exposed to climate-related risks and often have limited means to cope with or adapt to climate change. Providing geographic focus and priority investments to benefit the sector's most vulnerable provinces to increase climate resiliency remain a challenge.

Moreover, the COVID-19 crisis is an evident example of how adverse events outside of agri-fisheries can affect the sector. Although COVID-19 is fundamentally a public health issue, the pandemic has caused devastating impacts on the economy—both directly and through measures, to contain its spread. A variety of shocks have been observed at different points of the food value chain. The consequences are increasingly spilling over to the agri-fisheries sector such as abrupt changes to food demand, with ripple effects for supply chain organization, and job and income losses. While the DA has undertaken corresponding interventions such as establishing the Food Resiliency Task Force to keep the food systems functioning and the various adaptive measures exemplified by farmers, private firms, and LGUs alike, the COVID-19 outbreak has provided an opportunity to critically assess the vulnerabilities in agri-food systems. Learning experiences amidst an unprecedented crisis subsequently inform needed reforms that would strengthen the sector's resilience to future shocks.

## Resilience and Sustainability Strategies Aligned with DA New Thinking

The DA's "New Thinking," which covers eight paradigms or strategies for sectoral development and modernization, is central in realigning the agricultural strategies and refocusing priorities to "survive, reboot, and grow," under the "new normal." Under the survival principle, the DA will continue to implement resiliency and climate change programs and projects.

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<sup>26</sup>Forster, P.M., et al. (2020). Current and future global climate impacts resulting from COVID-19. *Nature Climate Change*. 10, 913–919. <https://doi.org/10.1038/s41558-020-0883-0>



Following are the agri-fisheries sector's transformation paradigms with the DA New Thinking—all done sustainably, with resiliency as support objective:

1. Modernization – taking innovations as proactive part of modernization strategy through mechanization, automation, physical technology, and more resilient varieties; e.g., greening of agriculture
2. Industrialization – a broader approach in addressing value-chain systems by extending focus beyond farm production, extending all the way to processing and marketing chains; e.g., agribusiness incubation
3. Export Promotion – better integration with international markets is a key strategy in increasing the incomes of farmers and enhancing their resilience. The revenue in export market is three to four times higher than local markets.
4. Farm Consolidation – a softer strategy in consideration of the majority of farmers' small landholdings. This means clustering of farmers or block farming through cooperatives and associations (cluster development and professionalization of cooperatives); and productive alliances with the private sector to increase productivity through introduction of business, manufacturing, and marketing into farm production.
5. Infrastructure Development – enhancing the agri-fisheries sector's infrastructure parallel to the country's transportation build-build-build projects; specifically, building on climate-proof infrastructure
6. Higher Budget and Investments For Agri-fisheries from the government and private sector
7. Legislative Support – crafting laws to sustain and institutionalize agricultural development agendas; e.g., (1) risk management and land tenure policies to increase the investment capacities of farmers, such as crop and livestock insurance and disaster protection system, and (2) addressing uncertain land-ownership rights that hamper adaptation investments
8. Roadmap Development – strategic planning taking a holistic perspective of the seven other paradigms or strategies; e.g., transforming key commodity-product development processes

### ***OneDA: A Holistic Approach to Agriculture and Fisheries Transformation***

The sector's resilience and sustainability must be addressed as a multi-dimensional and complex system. The strategies may be applied on the level of individuals (farmers and fishers) and communities, segments of the agri-fishery value-chains, and government and support institutions. OneDA is an inclusive and holistic approach, taking 18 key strategies to accelerate transformation toward a modern and industrialized Philippine agri-fisheries. The key strategies are grouped into four clusters, namely, Consolidation, Modernization, Industrialization, and Professionalization.

Factoring resilience to climate risks is one of four pillars of the DA's agri-industrial strategy. The OneDA approach lays out the crucial foundations for sectoral resilience:

- Landscape approaches that integrate natural resource management for low emissions and resilient production practices and value chains; slowing biodiversity loss and increasing circularity of supply chains
- Social safety nets and adaptive capacities for farmers and fishers and members of the value chain; enhancing social inclusion (leaving no one behind)
  - Shock-responsive and adaptive social protection
  - Social benefits
  - Access to basic services



- Alternative and supplemental livelihoods
- Mainstreaming of climate change adaptation
  - Nationally Determined Contribution
  - National Adaptation Plan
- Disaster risk reduction and management
- Research and development (R&D) – well targeted public investments in agri-fisheries R&D

## Indicative Policies and PPAs to Address Potentials and Gaps

Amidst the era of changing climate and other shocks and stresses, locally-led and inclusive efforts are critical in formulating policies and decision-making for a sustainable and resilient agri-fishery sector. The DA's twin objectives of *masaganang ani* (bountiful harvest) and *mataas na kita* (higher income) for farmers and fishers require a longer-term trajectory of agricultural transformation under the recurrent disturbances (climate-related) and impacts of unprecedented crisis (COVID-19). A good sustainability and resilience policy has a role to increase farmers' capacities and reduce vulnerabilities. It also needs to be proactive in improving information and learning from experience.

Moreover, the sector should be part of the broader economic recovery, which should be designed to “build back better” and ensure that no one is left behind. The Consolidation and Professionalization paradigms or strategies should involve enabling policies and programs for greater private sector engagement in climate resilience:

- As the agricultural risk landscape is changing, the policies should explicitly consider issues of climate resilience of micro, small, and medium enterprises (MSMEs) in national, local and sectoral development policies.
- They should also build on existing, well-functioning policies (e.g., climate change adaptation, disaster risk reduction) as an entry point for designing policies to support action on MSMEs' climate resilience as well and promote renewable energy, and energy efficiency.
- Multiply efforts to build the resilience of informal sector businesses through social protection schemes, support in formalization, and enhanced access to basic infrastructure (e.g., water, drainage, and electricity), among others. Informal governance arrangements help to balance diverging interests.
- Reflecting the diversity of MSMEs and private-sector actors more broadly, consider updating business- and trade-related regulations and policies in ways that are coherent with efforts toward greater resilience of MSMEs to climate risks.
- Ensuring food and nutrition security from a cross-scale whole food systems perspective. This means capturing the multiple components and outcomes of a food system, and across multiple scales and levels. The entry points identified in the resilience building process include: (1) national or regional food systems, which cover multiple value chains contributing to food security and other outcomes in a region; (2) individual food value chains, which lead to outcomes of diverse food systems, e.g., agri-fishery commodity-individual value chains; and (3) stakeholders' perspective in the value chain and the specific outcomes that concern them, e.g., smallholder livelihoods and consumer health, among others.
- R&D and policy need to go beyond traditional approaches and build continuous human capacity through community engagement. Specific support is needed for re-skilling and training for the sector's stakeholders as affected by various persistent climate and other related shocks and stresses (droughts, flooding, pest and diseases like African swine fever

for hog raisers and crop infestations), along with supportive policies such as reforming alternative agricultural livelihoods.

- On improving Climate Information Services (CIS). Capacity building should include upgrading of technical skills in climate data management and collaborative development of projects that engage both providers and users and promote common standards in generating and packaging climate information (CI) products. Farmers should be involved in the design, production, and evaluation of CIS to foster trust and local relevance. More project sites should be identified where CIS should be provided, with priority to areas planted with principal crops, especially in provinces with poorly observed parameters, poor spatial resolutions, and high-sensitivity to change.

In promoting the Modernization and Industrialization paradigms, the following areas should be considered for long-term policy toward climate resilience:

- Climate change adaptation and mitigation; integrating mitigation and adaptation in sustainable development pathways; and full support toward implementing the DA Bureau of Agricultural Research (BAR) Climate Change Research, Development, and Extension Agenda and Program for Agriculture and Fisheries (CC RDEAP) 2016-2022. To move forward, disaster and climate resilience could be seen as an integrated and multi-disciplinary approach that allows more linkage between emergency response and long-term perspective.
- Cross-sectoral, cross-government approaches that take a long-term, systemic view rather than single technological outcomes, such as through the National Strategic Plan of Action for disaster risk reduction in agriculture and fisheries, Climate Information Services
- Maintain long-term environmental objectives, enabling policies to reach the targets for the agricultural commitments to the Philippines' first Nationally Determined Contribution, e.g., through the National Greening Program (NGP).
- Actively support development of green finance flows to increase resilience. Despite the support for improved climate risk management policies over the past few decades, the financial impact of natural disasters continues to rise. Most farmers are financially incapable of absorbing the consequences of negative shocks. Policy interventions are needed to prevent substantial shocks to the sector, including but not limited to market failure and unanticipated drastic shifts in logistics and consumer demand.
- Build pipelines of sustainable infrastructure projects that assess climate risks across the lifetime of the project, and build resilience against future climate impacts including low-carbon developments. New infrastructure investments must ensure climate resilience and not increase exposure and vulnerability to reduce direct economic damages from climate-related disasters, minimizing the indirect costs of disruption of economic activities.
- Agricultural resources and ecological environment protection policy, e.g., inclusion of scenario projection in resource planning.

## Indicative Programs, Projects, and Activities

### *Integrative Perspective in Building Food System Resilience*

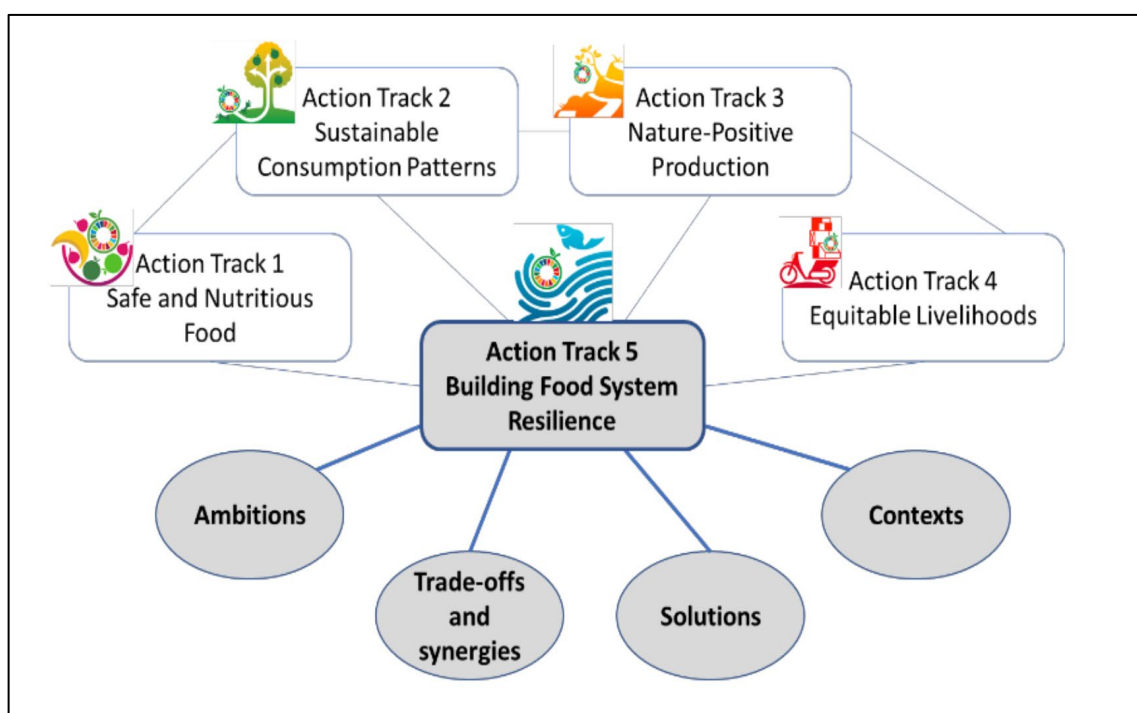
- Programs, projects, and activities (PPAs) should latch on to the UN food systems integrative perspective to build food system resilience, which consolidates other action tracks, namely: (1) safe and nutritious food, (2) sustainable consumption patterns, (3) nature-positive production, and (4) equitable livelihoods. The Action Track (AT) 5 (Figure 7.6) works to ensure the continued functionality of sustainable food systems in areas that are prone to conflict or natural disasters, promote global action to protect food supplies

from the impacts of pandemics, and ensure that all people within a food system are empowered to prepare for, withstand, and recover from instability.

### Synergies with Ongoing Initiatives

- Making resilience a part of the new normal in the agriculture and fisheries sector involves identifying ongoing initiatives that the projects will build on. Some of these projects are expected to provide/or have potential for co-financing for other projects.
- A more resilient economy depends on shifting to sustainable practices. Farmer-driven innovations and alternative practices are undervalued. Application of resilience approach to developing solutions for food security is needed, considering capacities for building resilience, the agencies and stakeholders involved, and the trade-offs and synergies to address and pursue. Examples of solutions include early warning systems, enhanced rural-urban mobility, improved market-trade routes and information, and priority PPAs on food insecurity in conflict zones.
- Developing sustainable and resilient PPAs on fisheries/aquatic food systems for poverty eradication. There can be no transformation of food systems if we fail to include food from the abundant bodies of water in the country. We must put to use the vast potential of fisheries. It is worth noting that aquatic foods reduce carbon footprints; and GHG emissions per gram of fish protein is lower.

**Figure 7.6: Representation of the Integrative Perspective of Building Food System Resilience and the Key Elements to Address Across Other Action Tracks** (Source: FAO)



- Green economy perspective and initiatives can be truly transformative. Low carbon, resource-efficient, and socially-inclusive development pathways should be grounded on the understanding that natural capital is a critical economic asset and a source of public benefits, especially for the poor whose livelihoods depend on natural resources. The National Greening Program, Integrated Natural Resources and Environment Management Project, Coastal and Inland Fisheries Resource Management are examples of PPAs with a green economy perspective.

- Innovation has become a primary force in determining sectoral growth and performance. A wide gap exists between aspirations to innovate and the ability to execute initiatives, especially in the fisheries sector. The comprehensive framework for fisheries sector sustainability, inclusion of the fisheries sector in spatial planning, and improvement of regulation/interaction at sea/coastal areas are examples of PPAs capitalizing on innovation.
- Harnessing financial instruments in support of a climate-resilient agri-fisheries sector. Examples include Climate Change Adaptation Financing Program (CCAFCP), and credit and insurance programs for MSMEs. These programs and projects should provide loans for climate-resilient farming and fishing practices, technologies and measures, and an integrated package of support services for farmers and fishers.

### ***Anticipating a Sustainable and Resilient Agri-Fishery Sector Circa 2030***

In the timeframe of a decade, many of the changes that are anticipated as a result of climate change will largely affect the sector's potential, not only to adapt, but also to thrive by producing more from less. Possible targeted PPAs should consider:

- Regenerative farming and fishing practices (compared to traditional extractive approaches), as well as low carbon access and use of innovative water and energy solutions. Improving water resources management will be critical. With increasing competition around land use, water, and budgetary resources, irrigation will need to become more efficient and accountable.
- Strengthening of natural resource and farm management skills, and in institutional preparedness. Institutions need to be equipped in adaptive management, together with multiple risk management along entire food systems, e.g., national contingency planning.
- Operationalizing resilience to disaster and climate change by combining disaster risk reduction, climate change adaptation, natural resource management, and social protection with prevention of undernutrition through community/ province-led approach, e.g., multi-sectoral seasonal analysis of the impact and threats of disaster and climate change on nutrition security, and food security and nutrition surveillance systems. This ensures the empowerment of communities in order to protect their lives and livelihoods from shocks and stresses.

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## CHAPTER 8

# Regional Spatial Planning for Agri-Fishery and Food System Transformation<sup>27</sup>

In this age of unanticipated disruptions brought by changing climate and demonstrated by the current COVID-19 pandemic, resiliency and sustainability of agri-fishery and food systems have become paramount parameters in planning for the agri-fishery sector. Sustainable land and water management need to be integrated in modernizing and industrializing agri-fishery and food systems.

### Toward Sustainable Land and Water Management in the Philippines

For sustainable land and water management (SLWM) to meet the growing and changing needs of the country's populace, it must continue to ensure steady flow of resources in a sustainable manner. It should also target those areas requiring immediate interventions such as reducing the impacts of land degradation and increase efforts in the rehabilitation of degraded lands. To provide sound recommendations related to SLWM, it is important that our land resources are first accounted, and their spatial distributions determined.

Forests play an important role in maintaining and restoring soil fertility, controlling erosion, and maintaining biodiversity to direct food production and provide fuel wood, fodder, and inputs for agriculture toward generating income and creating rural employment. These either enhance agricultural production and food availability or increase the ability of people to purchase adequate food supplies.

Based on the latest forestry statistics from the Department of Environment and Natural Resources (DENR), the total forest cover in the country in 2015 is estimated at 7.01M hectares, with about 2.03M hectares of it as closed forests, 4.68M hectares as open forests, and about 0.30 M hectare as mangrove forests (FMB, 2018). These estimates are mainly derived from the land cover map generated by the National Mapping and Resources Information Authority (NAMRIA). The total area of forests in 2015 is considered slightly higher compared to the 2010 statistics, which is about 6.84M hectares (FMB, 2015). An increase in the open and closed forests is also observed from 2010 to 2015. However, the mangrove forest experienced a slight decrease between the two periods.

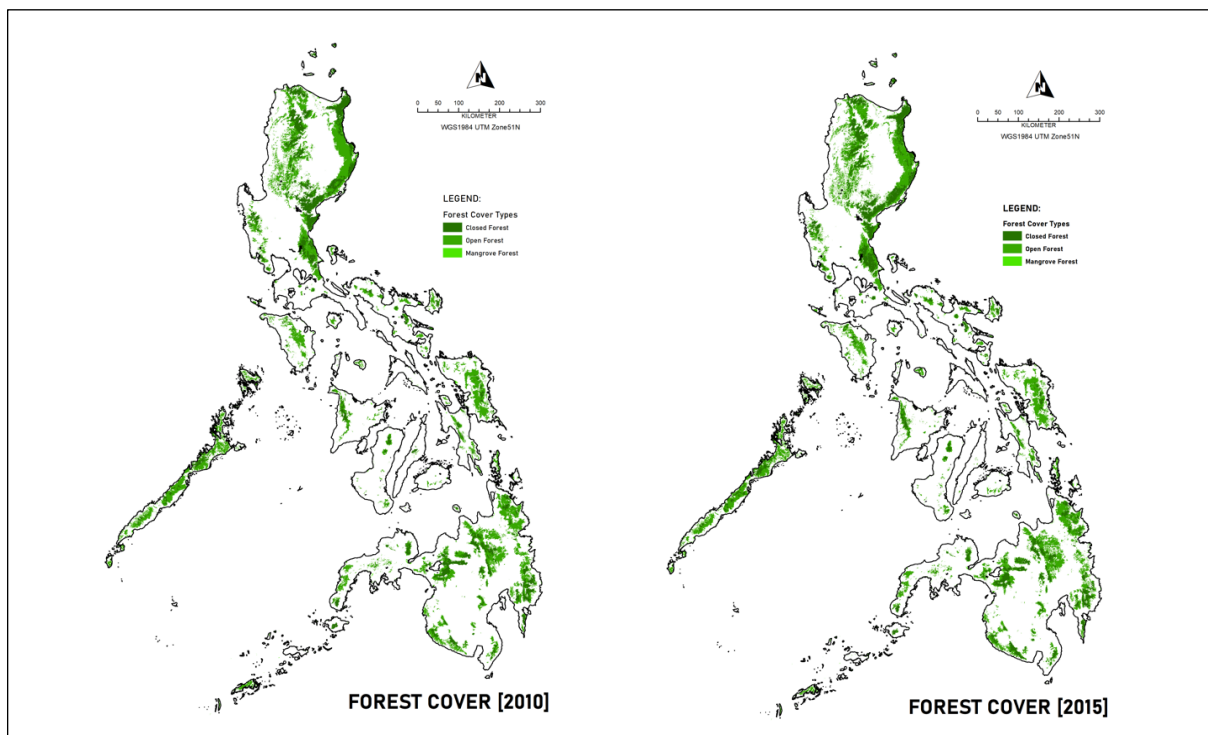
Figures 8.1 and 8.2 show the spatial distribution of the forest cover in the country. Based on the data, Region 2 has the highest total area of forest compared to all other regions, both in 2010 and in 2015 (Figure 8.3). This is followed by Region 4B or MIMAROPA, then CAR, and finally Region 13. In terms of closed forests, Region 2 still has recorded the highest area of coverage (Figure 8.4). This is succeeded by CAR then Region 3 or Central Luzon area. However, large areas of open forests can still be found in Region 4B or MIMAROPA as well (Figure 8.5). This is followed by Region 13, Region 2, and CAR. The mangrove forests, on the other hand, have noticeably declined especially in regions with large mangrove forests before (Figure 8.6). These include Region 4B, ARMM, and Region 8.

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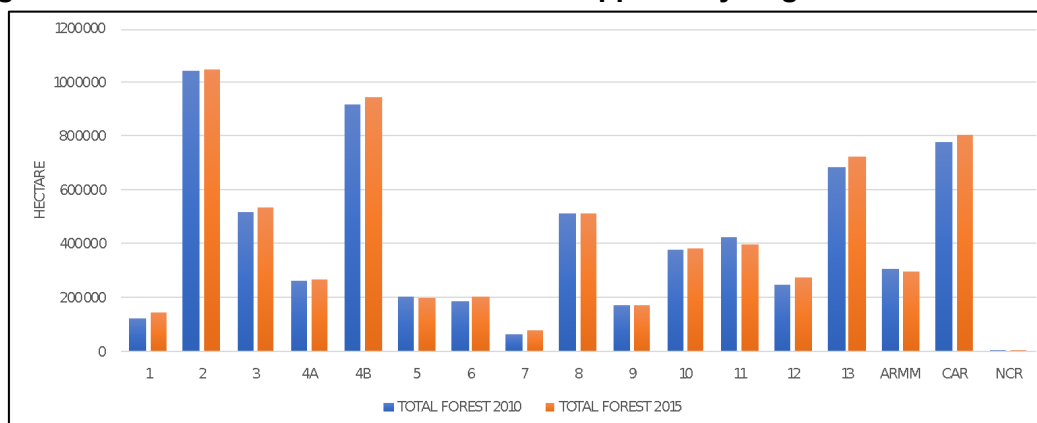
<sup>27</sup>Prepared by Cristino L. Tiburan, Jr., PhD, GIS Expert and Patricia Ann J. Sanchez, PhD, Sustainable Land Management Expert, SEARCA



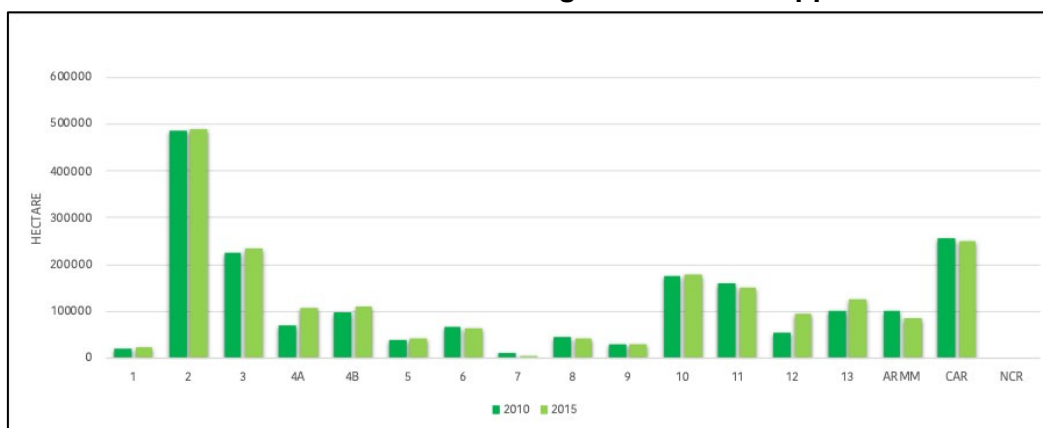
**Figure 8.1: Forest Cover Map of the Philippines in 2010 and 2015**



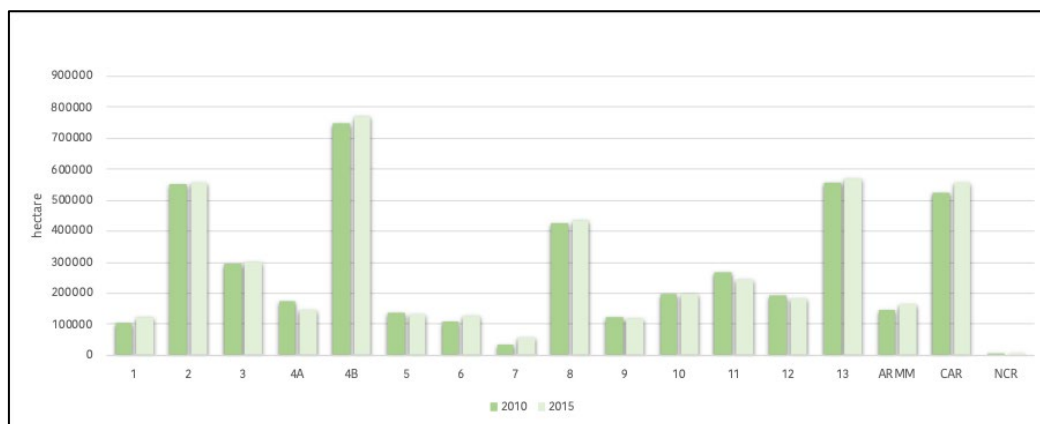
**Figure 8.2: Distribution of Forests in the Philippines by Region in 2010 and 2015**



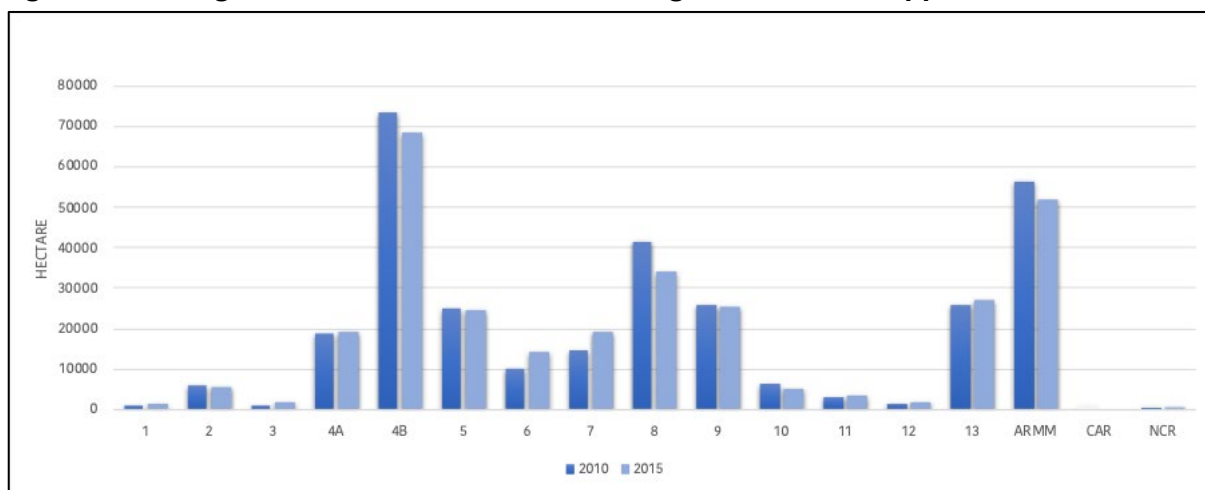
**Figure 8.3: Closed Forests in the Different Regions of the Philippines in 2010 and 2015**



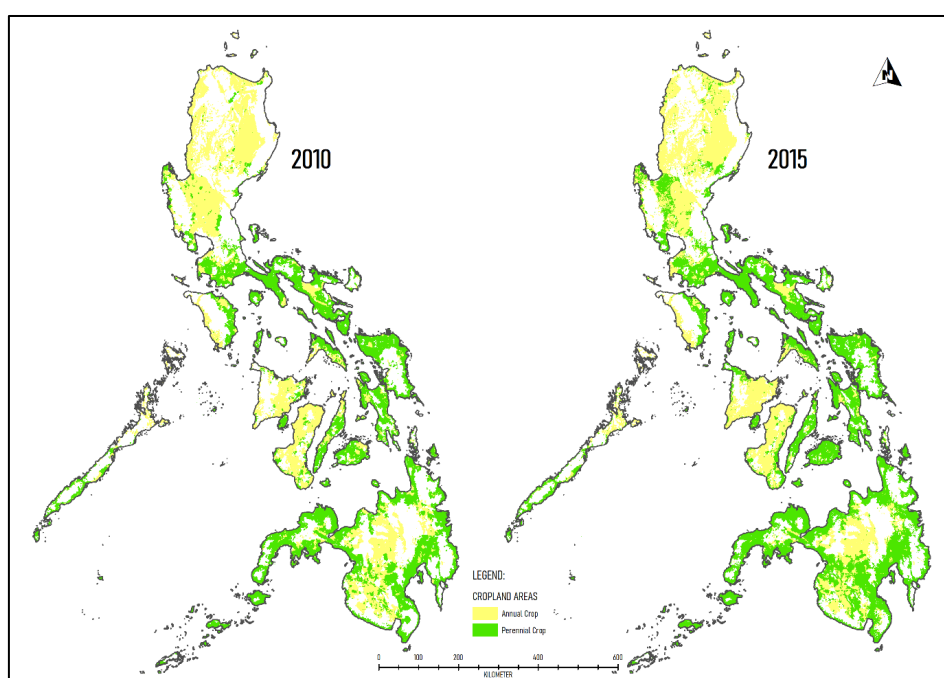
**Figure 8.4: Open Forests in the Different Regions of the Philippines in 2010 and 2015**



**Figure 8.5: Mangrove Forests in the Different Regions of the Philippines in 2010 and 2015**

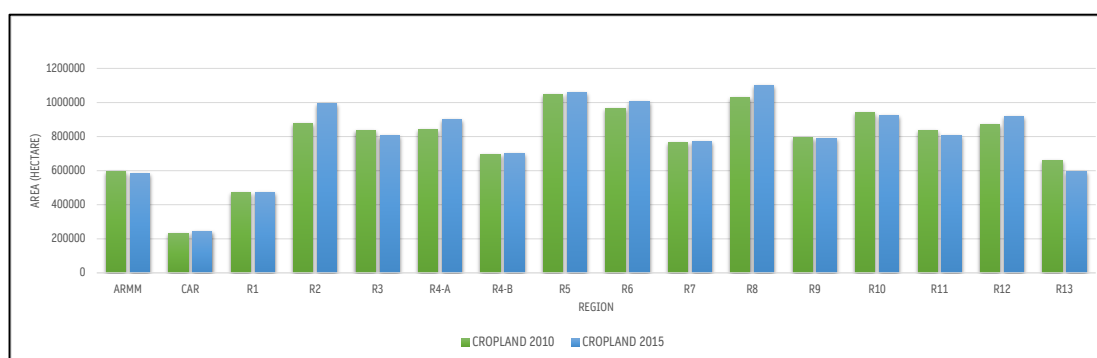


**Figure 8.6: Cropland Areas in the Philippines based on NAMRIA**

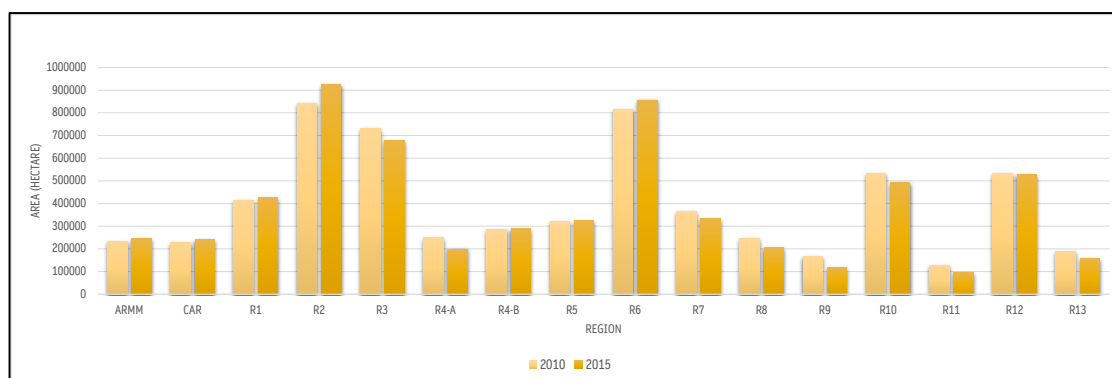


Based on the NAMRIA land cover maps, the cropland areas in the country were likewise estimated at 12.45M hectares and 12.67M hectares in 2010 and 2015, respectively (Figure 8.6). Figure 8.6 shows around 2% increase in cropland areas over the five-year period. Large cropland areas were mostly found in Region 2, Region 5, and in Region 8 (Figure 8.7). However, in terms of percent increase in cropland areas, Region 2 recorded the highest increase of about 13% or around 115,000 hectares from the 2010 to 2015. Cropland areas in the NAMRIA land cover map are further categorized as annual crops and perennial crops. Cagayan Valley or Region 2 has recorded the largest area of annual crops in the country with around 0.84M hectares in 2010 and about 0.92M hectares in 2015 (Figure 8.8). This is followed by Region 6. In terms of perennial crops, Region 8 has the largest coverage with around 0.78M hectares in 2010 and 0.90M hectares in 2015 (Figure 8.9). This is succeeded by Regions 5 and 11.

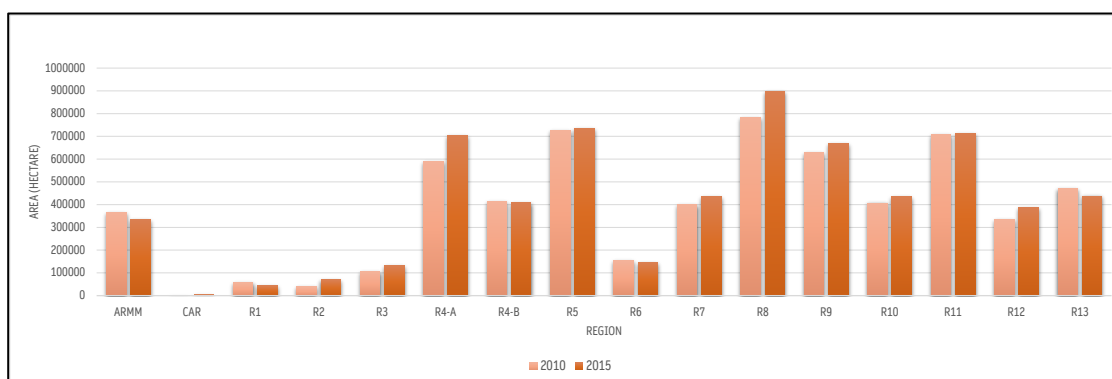
**Figure 8.7: Distribution of Cropland Areas in the Philippines by Region in 2010 and 2015**



**Figure 8.8: Annual Crops in the Different Regions of the Philippines in 2010 and 2015**



**Figure 8.9: Perennial Crops in the Different Regions of the Philippines in 2010 and 2015**



## Definition of and Rationale for Spatial Planning

Spatial planning is largely a public sector function to influence the future spatial distribution of activities. It aims to create a more rational territorial organization of land uses and the linkages between them, to balance demands for development with the need to protect the environment, and to achieve social and economic objectives. Spatial planning tries to coordinate and improve the impacts of other sectoral policies on land use, in order to achieve a more even distribution of economic development within a given territory than would otherwise be created by market forces. Spatial planning is therefore an important lever for promoting sustainable development and improving the quality of life.

Spatial planning refers to the methods used by the public sector to influence the distribution of people and activities in spaces of various scales in order to improve the built, economic, and social environments of communities. Separate professional disciplines which involve spatial planning include land use, urban/urban renewal, regional, transportation, economic, and community planning. Spatial planning takes place on local, regional, national, and international levels and often results in the creation of a spatial plan.

The advantages of spatial planning include the following:

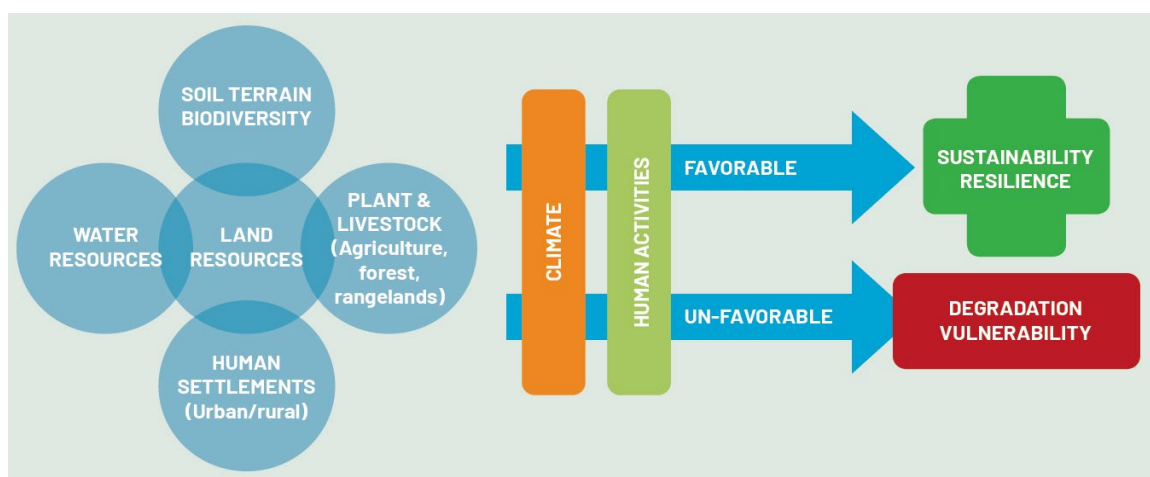
1. It promotes planning and institutional convergence within the region as planning area;
2. It minimizes, if not avoids, overlap or duplication between and among planned investments.
3. It articulates the functional role of zones within the planning area, e.g., production center vis-à-vis agri-industry hub/park (growth center) serving production areas (core-periphery integration).
4. It identifies potential agri-industry centers/hubs to be located in urban and peri-urban areas to be tied to organized clusters of farmers and fishers living in peripheral/ rural areas (DA F2C2 program).
5. It enhances the ecological balance between and among landscapes, e.g., protecting the biological integrity of waterways within a watershed.

The rationale for spatial planning anchors on the premise that an increasing demand for food and other agricultural products is brought about by population growth and competing use of resources especially in the agri-fishery and forestry sectors. Without proper planning, this may lead to unsustainable use of resources (land and water), and may pose threats to biodiversity, aggravate land degradation, decrease ecosystem services, and increase vulnerability to climate change, among others. Thus, an integrative and climate-responsive land use planning focused on agri-fishery and food systems transformation in the country is paramount.

### ***Integrated Land Use Planning***

Land use planning should carefully consider climate change resilience and ecosystem management to ensure sustainable use of land resources guarding biodiversity and soil fertility. Adopting sustainable land management (SLM) alternatives needs to be facilitated by an enabling environment with appropriate policies and legislation, ensuring a secure land tenure system, and mobilizing medium and long-term financial investments. The Food and Agriculture Organization of the United Nations (FAO) provides an integrated land use planning (ILUP) approach to assist with inter-sectoral planning processes and implementation for the sustainable use of land resources (Figure 8.10). Figure 8.11 presents the premise that land use planning includes spatial land use planning as one subset (Matternich, 2017 in FAO, 2020).

**Figure 8.10: Integrated Planning Approach (FAO, 2017)**



**Figure 8.11: Land Use Planning with Spatial Land Use Planning as a Subset (Matternich, 2017 in FAO, 2020)**



### The Spatial Planning Methodological Framework

The spatial planning methodological framework provides guidance on applying the process in the NAFMIP. The process has four stages: (1) setting objectives and scope; (2) assessing the current situation, gaps, and conflict; (3) undertaking the integrated planning process; and (4) establishing an implementation and monitoring mechanism.

#### 1. Spatial Planning Objectives

For purposes of the NAFMIP, the following are suggested as objectives of spatial land use planning:

- a. Reduce land degradation through sustainable soil, land, and water management (SSM/SLM/SLWM);
- b. Protect the productive agricultural areas from further conversion to other forms of land use (e.g., urbanization, industry) to ensure food security;

- c. Provide for multi-sectoral and participatory planning;
- d. Delineate land areas or zones for agriculture including potential agri-fishery industry hubs/centers;
- e. Harmonize interventions to provide alternatives for other sectors (i.e., tourism and industry) without compromising prime agricultural areas; and
- f. Factor climate change vulnerability and biodiversity protection in land use planning.

## **2. Assessing the Current Situation, Gaps, and Conflict**

This stage proceeds with the following steps:

- a. Analyze existing situations, identify sectoral priorities, and locate significant land use conflicts related to agriculture and fisheries.
- b. Use inventories, geographic datasets, interviews, surveys, and consult stakeholders.

This stage requires data on demographic profile and administration, agri-fishery-ecology (i.e., terrain, land cover, water resources, climate, soils, etc.), technical and social infrastructures (i.e., roads, urban centers, settlements, etc.), land tenure systems, and legal data and information, among many others.

In DA, there are several initiatives that are being implemented that can be potential sources of data. One of them is through the Philippine Rural Development Project (PRDP), which aims to increase incomes and enhance the productivity of farm and fishery areas in the country. One main function of the project is the preparation of the provincial commodity investment plan (PCIP) which involved commodity prioritization and value chain analysis. This in turn eventually leads to the identification of potential interventions in the target areas. Some links of potential data sources were also being held in the PCIP Planners' Portal (<https://www.pciplannersportal.tk/>). In this website, one of the data sources is the iRoad database, which serves as a repository of GIS-based Farm-to-Market roads or FMRs.

## **3. Undertaking the Integrated Planning Process**

The integrated planning process encompasses the following:

- a. Discussion between different sectors, institutions and stakeholders at various levels about priorities, opportunities and actions;
- b. Conduct of various geospatial-based analysis such as land capability mapping/zoning, climate change vulnerability assessment, crop suitability analysis, sustainable soil and land management (SSM/SLM) and the like that can be used to identify different land use scenarios or options; and
- c. Selection of land use options that are socially acceptable, environmentally sustainable, economically viable, and legally possible under current policies and regulations.

Some tools for spatial-based analyses being implemented in DA include the PRDP's iPlan process which utilized the **expanded vulnerability and suitability assessment (eVSA)**. This tool helps identify priority areas for intervention based on socio-economic variables, land suitability, and land limitation factors. Another tool that is linked in the PCIP Planners' Portal is the **climate risk vulnerability assessment (CRVA)**. This tool is aimed to support resilience-building initiatives particularly focusing on the areas of hazards, adaptive capacity, and climate suitability. The Department is currently on the stage of trying to harmonize these two tools into the **GeoSMART app** or the **GeoSpatial Management, Analytics, and Repository Tool**. Another tool that was developed was through the Sustainable Land Management (SLM) project which aims to capture land degradation based on type, degree, and spatial extent of



land degradation occurrence. This tool is called the **composite land degradation index (CLDI)**.

#### 4. Establishing an Implementation and Monitoring Mechanism

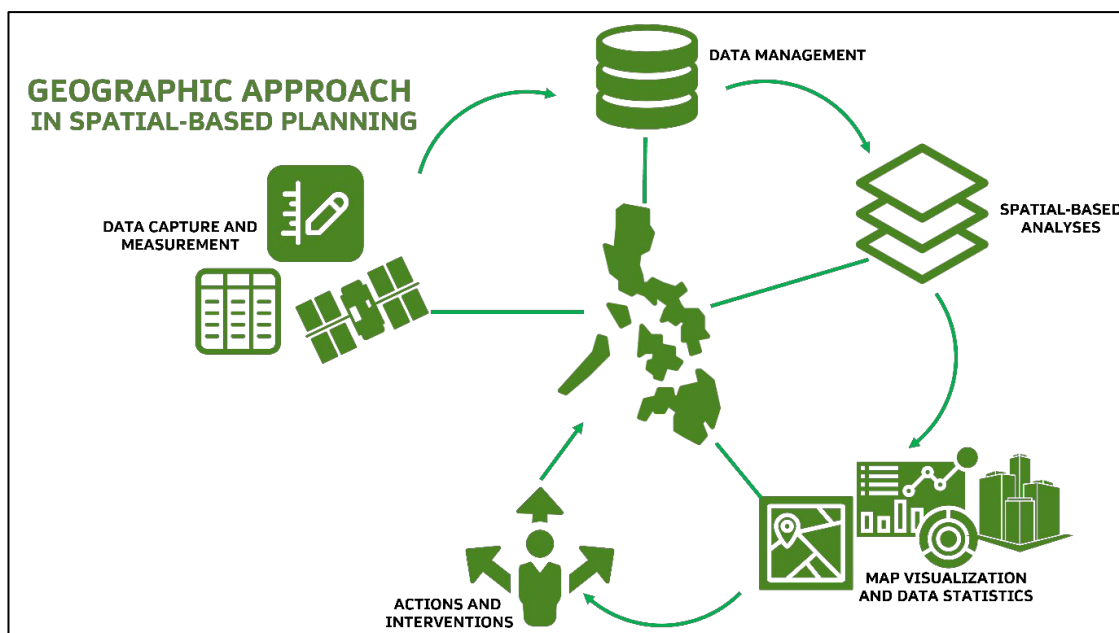
To establish an implementation and monitoring mechanism, agri-fisheries planners need to:

- a. Define the strategies, actors, and timeline of the plan, and ensure that these plans are included in the activities of the different institutions for implementation;
- b. With communication counterparts in the bureaucracy and partner organizations, develop an appropriate communication plan to ensure engagement of stakeholders and communities during plan implementation (see Chapter 11); and
- c. Ensure that a monitoring and evaluation system is in place for reviewing, analyzing, and understanding the progress and performance of the different activities being implemented out of the plan.

#### Geographic Approach in Spatial-based Planning

The geographic approach in spatial-based planning includes the following components or elements: data capture and measurements, data management, spatial-based analyses, map visualization and data statistics, and actions and interventions (Figure 8.12). Given the capability for geographic information systems (GIS) that DA has started building up, the different units of DA should come into an agreement on how to consolidate these various datasets and databases into a centralized repository center that would handle and manage all their data.

Figure 8.12: Geographic Approach in Spatial-based Planning



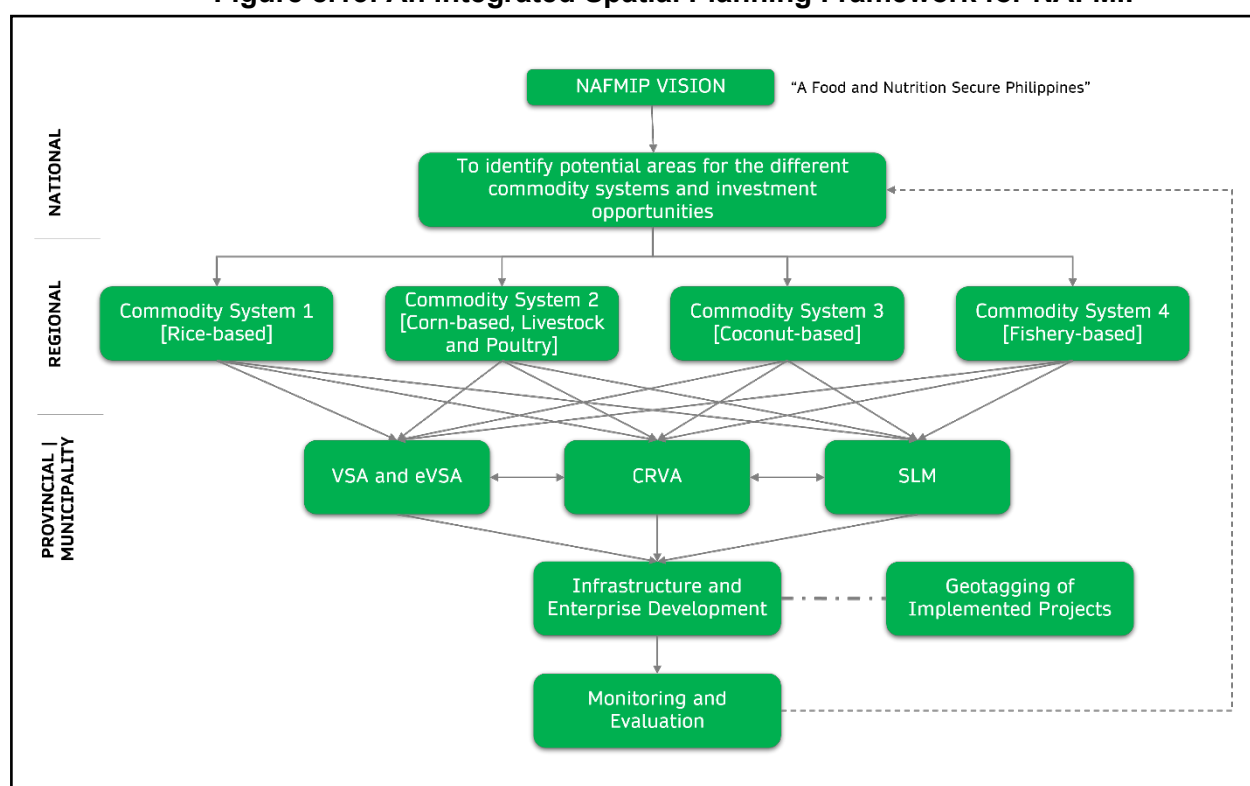
GIS can provide technology and methods for data integration, spatial analysis, and collaboration. GIS is considered also as a science-based framework for organizing workflows that can be used for integration and can aid in the decision-making process. It helps improve the way we do things by facilitating better decisions, ensuring efficiency with time and resources, and by communicating more effectively through geospatial visualization.

## An Integrated Spatial Planning Framework for the NAFMIP

The NPT is developing an integrated spatial planning framework (ISPF) in NAFMIP to mainly support the shift in focus of the Department from single commodity to commodity systems approach to planning for agri-fishery and food systems.

The ISPF provides a general outlook on how these different commodity systems can be identified and how it can be utilized for planning and in determining potential interventions in the agri-fishery sector. It includes using existing tools and/or approaches being implemented in DA to further refine and validate the identified commodity systems. However, the existing tools will require some improvements and updating during the initial phase of implementation of the NAFMIP in alignment with the projected shift from single commodity to commodity systems approach. Figure 8.13 presents the ISPF for NAFMIP.

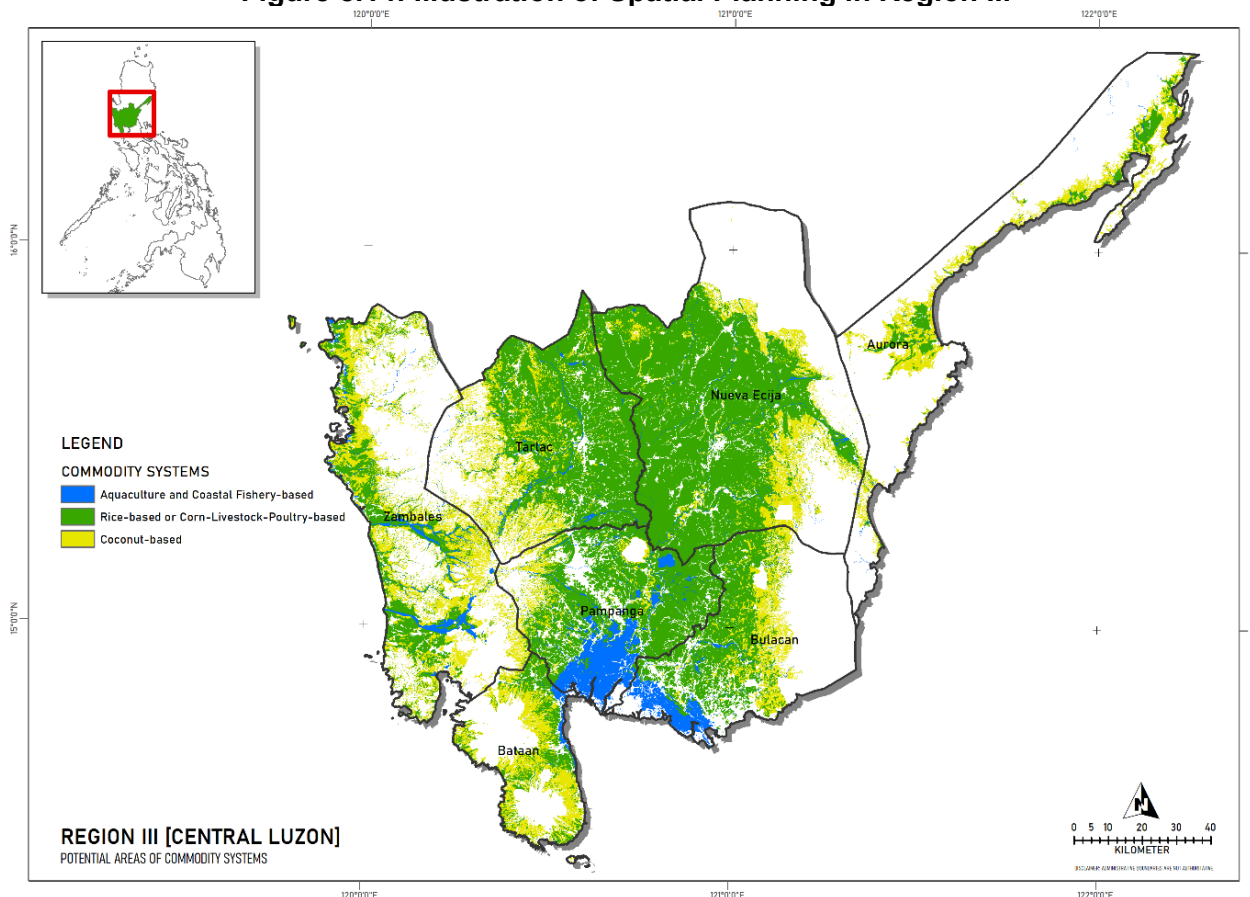
**Figure 8.13: An Integrated Spatial Planning Framework for NAFMIP**



This framework highlights that the ISPF is anchored on the vision of the plan to have “A Food and Nutrition Secure Philippines” and that one of its transformative goals is to shift into a commodity systems-based approach. At the regional level, the potential areas for the different commodity systems shall be identified and these are the rice-based, corn-based (including livestock and poultry), coconut-based, and the fishery-based systems. A fifth type of commodity system called the geographically specialized commodity system (GSCS) is also included for those regions that would not normally fall with the four commodity systems.

An example of the potential distribution of commodity systems in the region is shown in the map of Region III or the Central Luzon region (Figure 8.14). This is derived using the land cover maps provided in the above discussion and coupled with other map layers like slope, digital elevation models (dem) and protected and reserved areas, among many others. This will provide a quick outlook on where these different commodity systems can be potentially applied.

Figure 8.14: Illustration of Spatial Planning in Region III



Once the potential distribution of commodity systems is identified, these should further undergo discussions between the concerned provincial institutions and other stakeholders in the region. The process should now identify the main anchor commodity of the region, and this will narrow down the focus or priority of the region.

This is an essential process to help identify later the best optimal scenario. Other than the priority anchor commodity, the different commodities linked to the anchor commodity should also be identified. This may also help fill in the gap of its current targets especially in terms of its prioritization of commodities. For instance, if a given commodity is not yet a priority now in the area but has been found to be a good complement of the anchor commodity identified, then this can be included in the priority targets of the different units in the region and provinces in that area.

Certain assessment or analysis can be conducted using tools and approaches, either existing or to be developed, to ensure not only as a complementary to the anchor commodity but more importantly that it will thrive successfully in the area. Several possible spatial-based analyses and assessments that can be implemented to determine the optimum scenario or option for these commodities may include crop-suitability mapping, climate change vulnerability assessment, and sustainable land soil and land management, among many others. Combining the results of these different spatial-based analyses with the initial generated commodity systems will be able to provide a more refined output of the potential spatial distribution of the priority commodity systems in the region including the provinces and the municipalities.

This process may also result to the identification of various potential interventions in the area. As shown in the framework, once these interventions are realized and implemented, they will be geotagged and will be monitored as well. Geotagging is a process of adding geographical

identification to various media such as photograph or videos. DA has also developed an enhanced GeoCamera app that enables photos to be verified of where they were taken and where added security using QR code was also integrated into the application. These new interventions will feed back again to the system and will form part of the database of DA. They may be utilized again in future planning activities of the Department or its other units in the regions, provinces, and municipalities/cities.

## Challenges and Ways Forward

The NAFMIP team for Regional Spatial Planning encountered constraints in availing of data and other proxy indicators/variables toward accomplishing its deliverables and were able to gather more definite information on what is available from DA projects and operating units during presentations by the Department's resource persons arranged by its Planning and Monitoring Service in October 2021.

Some DA projects and initiatives have applied spatial-based tools including eVSA, CRVA, and CLDI, among many others. Databases were further noted during previous consultation meetings with the different concerned units in DA, such as the iRoad of PRDP and the Farmers' Guide Map of the Climate Resilience Agriculture Office (CRAO). However, with the shift of NAFMIP focus from single commodity into commodity systems approach, these tools need to be integrated and/or harmonized during the initial phase of implementation of the 10-year Plan.

The ISPF is the NAFMIP Preparation Team of consultants' contribution to this 10-year Plan. While at the outset the spatial planning framework was primarily intended to integrate SLWM in the sector plan, it has gone beyond the concerns of SLM/SLWM as a crosscutting tool in the commodity systems approach to planning for agri-fisheries and food systems transformation and in developing agri-fishery industrial growth corridors. During the NAFMIP planning exercises, it is important for planners to identify and agree on components/elements that will be conducted at various stages (recovery, growth, resiliency) and levels of the spatial planning process, i.e., national, regional, and provincial.

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## CHAPTER 9

# Agri-Fisheries Governance and Institutions<sup>28</sup>

## Context and Rapid Assessment

### Sector Overview

**T**he agriculture and fisheries sector is a big, dynamic, and complex single economic sector in the country.

The Department of Agriculture (DA) is the executive department of the national government responsible for the promotion of agricultural and fisheries development and growth by providing the policy framework, public investments, and support services needed for domestic and export-oriented business enterprises.

At present, the department envisions a food-secure Philippines with prosperous farmers and fishers. It shall collectively empower them and the private sector to increase agricultural productivity and profitability, taking into account sustainable, competitive, and resilient technologies and practices. Hence, its battlecry is simply: *“Masaganang Ani at Mataas na Kita!”* (DA website)

As stipulated in the Philippine Development Plan (PDP) 2017-2022, Chapter 8, Expanding Economic Opportunities in Agriculture, Forestry, and Fisheries, the agriculture, forestry, and fisheries (AFF) sector “is pivotal in generating employment for about a third of the country’s labor force, thereby reducing poverty and inequality for three-fourths of the poor who are in the rural areas. AFF is also key to providing raw materials to the manufacturing and service sectors, resulting in forward linkages in terms of higher-paying and more stable job opportunities. Intensifying efforts to revitalize the AFF and harnessing its growth potentials are needed to promote more inclusive development. Given the sector’s links to agribusiness, interventions and investments will be channeled to expand existing opportunities and develop new ones, thus inducing greater participation of small farmers and fishers.” (DA website)

Currently, the department has ten staff or service offices and 15 regional field offices, which are all directly connected to the Office of the Secretary. The department also has nine attached agencies, eight bureaus, and eight attached corporations, which have their own distinct organizational setups. Specifically, they have their own support or service units and offices.

Likewise, not all of them have regional or subnational offices. In fact, they have varying levels of linkage to the staff or service offices and regional field offices of the department.

The department, through its various offices, provides several services, as follows: (1) accreditation of civil society organizations; (2) accreditation of cold storage warehouse; (3) accreditation, licensing, regulation and other related services; (4) agribusiness and marketing assistance; (5) agricultural credit and financing programs; (6) agriculture and fisheries information services; (7) regional operations monitoring services; (8) soils and water services; (9) special projects coordination and management assistance; and (10) training and extension services (DA website).

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<sup>28</sup>Prepared by Nicasio Angelo J. Agustin, PhD, Governance and Institutions Specialist, FAO



## **Governing and Enabling Policies**

The development of the agri-fisheries sector is anchored on existing enabling policies, as follows: (a) the agriculture and fisheries modernization act (RA 8435); (b) the fisheries code (RA 8550); (c) the local government code (RA 7160); and, most recently, the Mandanas Ruling of 2018.

**Republic Act 8435 or the Agriculture and Fisheries Modernization Act of 1997.** It is a policy instrument defining measures to modernize the country's agri-fisheries and make it more competitive in the global market.

The underlying principle behind the policy is to improve the living conditions of farmers and fishers and increase their productivity amidst the growing needs of the markets—both domestic and abroad. In general, however, the AFMA aims to transform the agriculture and fisheries sectors to technology-based, advanced and competitive industry; ensure that the small farmers and fishers have equal access to assets, resources and services; guarantee food security; encourage farmer and fisher groups to bond together for more bargaining power; strengthen people's organizations, cooperatives and non-government organizations by enhancing their participation in decision-making; pursue an aggressive market-driven approach to make the products more competitive in the market; stimulate further processing or agri-fisheries products and make them more marketable; and implement policies that will invite more investors to establish business in the country (Aquino et al., 2013a).

The AFMA laid down several reforms aimed at improving the agriculture and fisheries sector. The law enables the creation of collective approaches that induce a variety of programs, services and activities that were carried out—or yet to be carried out—by a diverse set of implementing agencies and organizations, both from the public and private sectors with the overall intent of enhancing competitiveness of the country's agriculture and fishery products. The law has broad based provisions covering: (a) production and marketing support services; (b) human resource development; (c) research, development and extension; (d) rural non-farm employment; (e) trade and fiscal incentives; and (f) general provisions.

Being the centerpiece policy of the government for over two decades now in promoting growth and eliminating poverty in the rural sector, proper assessment of this law has to be undertaken.

**Republic Act 8550 or the Philippine Fisheries Code of 1998.** This is the governing law to address the interconnected issues of resource degradation and unrelenting poverty among municipal fishers. It provides for a national policy on sustainable use of fishery resources to meet the growing food needs of the population. It calls for management of fishery and aquatic resources in a manner that is consistent with the concept of an integrated coastal area management in specific natural fishery management areas (Aquino et al., 2013b).

The law encourages participatory and collaborative approaches in resource management. Participatory management through various levels of Fisheries and Aquatic Resources Management Councils (FARMCs) is enhanced and institutionalized by the law. The combination of organized fishers and local government units is intended to serve as a venue for close collaboration among civil society groups in the management of contiguous resources.

**Republic Act 7160 or the Local Government Code of 1991.** The main feature of the LGC is the transfer of responsibilities of the national government to local government units in the provision of public goods and social services. To efficiently deliver the devolved tasks, the LGUs were given increased powers to mobilize their own resources.

The law is also the legal instrument on the decentralization of the agricultural extension system in the Philippines. Specifically, agri-fisheries support, extension, and on-site research services



and facilities have been devolved to the barangays, municipalities, and provinces. The LGC includes both the administrative and technical supervision of the local governments over the field implementers, also known as agricultural extension workers. While there were a lot of concerns related to the decentralization of extension services, these were eventually addressed in the AFMA and Fisheries Code. For example, the LGC failed to provide mechanisms for the central government or next higher level of LGU to direct assistance or augment services and facilities assigned to the LGUs. However, the AFMA mandates the: “provision of training, information and support services by the government and non-government organizations to the agriculture and fisheries sectors to improve the technical, business and social capabilities of farmers and fishers.”

***The Mandanas ruling of 2018.*** The Mandanas ruling specifies that the just share of LGUs, also known as Internal Revenue Allotment (IRA), must be computed based on all national taxes, and not just from National Internal Revenue Taxes (NIRT). This includes other taxes such as those collected by the Bureau of Customs and agencies that are authorized by law to collect NIRT.

In effect, the ruling implies that more national government resources are to be poured to LGUs. Given this, the most important task is the clear delineation of the roles and responsibilities between national government agencies whose services are devolved to LGUs as mandated by RA 7160 or other laws, on one hand, and the LGUs, on the other.

In the case of the agriculture sector, services to be delivered—from production to distribution to consumption—should be specifically defined and delineated between the DA and the LGUs. Given the level of capacity of some LGUs, the DA should be able to help the LGUs transition in embracing their new mandates and be able to deliver what is expected of them. In the end, however, the reality should be recognized that LGUs would become more prominent and active in achieving the goals for the agriculture and fisheries sector. The operating units of DA would then have to transform itself and be able to assume more significant roles and responsibilities focused on capacity enhancement and institutional strengthening rather than on actual program and project implementation and execution.

### ***Institutional Challenges: Binding Constraints in Sector Development***

It can be noted that the performance of the agri-fisheries sector measured in terms of its contribution to the Gross Domestic Product (GDP) has been decreasing over the past few decades. In fact, its contribution has shrunk from 11.3% in 2015 to 9.2% in 2019 (at constant 2018 prices), and its annual average growth rate has been just a little more than one percent; for example, the 2019 GVA in AFF at constant 2018 prices grew by 1.2%, higher than the 1.1% increment in 2018 (Philippine Statistical Authority, 2020).

Several factors contribute to the dismal performance of the whole sector. These include: (a) low labor productivity; (b) low land productivity; (c) low marginal productivity as compared to other Asian countries; and (d) poor state of the country’s competitiveness measured in terms of gate prices of primary agricultural products.

The Asian Development Bank summarizes the main binding constraints on the development of the sector, which are low productivity, limited connectivity, and weak resilience (ADB, n.d.). “Sector development is further inhibited by inadequate support services such as access to affordable finance, business development services, supply chain enhancements, and extension services. Compounding all these issues are policy, institutional, and governance concerns.”

Habito and Briones (2005) pointed out that “the poor performance of the Philippine agricultural sector in recent decades traces not so much to weaknesses in the production sector itself, but

to failures and shortcomings in the policy and institutional environment within which the sector operates. This environment has been shaped by price intervention policies (including trade policies), public expenditure allocations, and institutional and governance weaknesses in the sector.”

Relative to the institutional and governance weaknesses in the sector, Habito and Briones (2005) reported that “analysts have constantly pointed to the following: (a) over centralization; (b) politicization of the bureaucracy; (c) lack of clear organizational framework; (d) fragmentation and weak coordination; (e) weak technical and managerial capability; (f) unclear communication lines; (g) unstable budget; and (h) corruption.” Note that while the report was made more than a decade ago, traces of these observations are still very much apparent. These interrelated difficulties could be described, as follows:

**Over-centralization.** Despite the decentralization of agriculture extension services as mandated under the local government code, there is still a strong impression that sub-national entities are dependent on the central government for budget and funding support, technical knowledge, overall sector direction, project selection and prioritization, and resource mobilization. This tendency should be expected because the sector and the nature of the whole system are wide and far reaching. The leadership of the Department of Agriculture is quite strong—and it has to be so—because of the challenges that surround the sector for an extended period of time. It has to control how the sector is managed and handled. At the same time, sub-national entities have exhibited tendency to depend on the central government to cope with the varied, multi-faceted and enormous sector challenges at the local level.

Given the foregoing, the practice of over centralization tends to reduce public accountability and responsiveness to local preferences. The scope for decentralization should then broaden the involvement of local leaders and rural communities in decision-making and program implementation, which in turn, could significantly improve the quality of public service delivery.

**Politicization of the bureaucracy.** Politicization of bureaucracy is broadly defined as the substitution of impersonality for personal criteria in the functioning of the bureaucracy. More specifically, this means that political principals attempt to exercise control over the bureaucracy, and this is not only for the agri-fisheries sector but the whole bureaucracy. The implications of this are: (a) programs and priorities change as government leadership change—both national and local; (b) funds and resources are deployed based on temporal priorities of political leadership and administration; and (c) agency operations, procedures and mechanisms are continually adjusted to suit short-range political thrusts and directions.

While the effects of politicization of the bureaucracy are not all and always unpleasant, the challenges besetting the agri-fisheries sector require more stable, long-term policies and overarching principles to ensure stronger and long-lasting foundation for the sector over a period that goes beyond political regimes.

**Lack of clear organizational framework.** Various services and programs are delivered and implemented by offices and units within the Department of Agriculture and by other government entities outside it. There are other services provided by non-government institutions. That being said, the agri-fisheries sector is wide and expansive. It cuts across functional mandates and thematic focus of several agencies and entities of the government and the private sector.

Development goals and directions for the different agencies and entities are not clearly and concretely translated into their sub-national components. Likewise, it is not clear how sub-national level objectives and efforts are contributing to the achievement of overarching development objectives of the whole sector. Efforts and directions of the various operating units of the department as well as other stakeholders are disjointed at all levels of governance.

While development objectives are not clearly defined, plans are not likewise formulated and, and if ever they were, they are not implemented, and policies are not strictly enforced.

Without a clear organizational framework, there is a tendency for agencies and entities—despite being related to each other—to continue acting independently and to implement programs, projects and activities that are overlapping. This practice leads to inefficient use of resources. There is also a tendency to focus on the more obvious concerns and miss out giving priority to the less apparent yet similarly important challenges besetting the sector. When these happen over an extended period, they create unnecessary and significant development gaps.

**Fragmentation and weak coordination.** It has been observed that coordination among duty bearers and stakeholders in the agri-fisheries sector is wanting. There is a weak link and connection—horizontally and vertically—among service units or offices as well as bureaus, agencies and corporations within the department. This situation is mirrored in the relationship of these offices of the department with other agencies and entities within and outside the government.

Various entities act on the basis of their respective mandates and not on a strongly unified and concerted effort to bring about life-changing and high impact reforms and interventions for the whole sector.

**Weak technical and managerial capability.** Capability refers to the application of knowledge responsive, adoptive and appropriate to a given situation. While individuals possess adequate technical and managerial training and capacity development, lessons and learnings are not apparent in decisions made and actions taken especially at the micro-level, which significantly affect the macro state of the sector.

Skills and competencies that are wanting include conceptual, innovation, communication, decision-making and stakeholder management, especially in relation to effecting development of the whole sector.

**Unclear communication lines.** Given the complexity of the whole agri-fisheries sector, it is imperative to have clear lines of communication. The intention is to promote coordination and accountability by defining the line of command, i.e., power, authority and responsibility at various levels among units within the department and with other government agencies as well as with other stakeholders.

This may also apply on what messages to be shared to the intended publics or audiences of the sector and how feedbacks should be treated to improve service delivery.

**Unstable budget.** This means that there is no established coordinated and rational system of identifying the funding requirements of all units within the department as well as the allocation of budget among its different service units and program offices as well as its sub-national units.

Allocation of budget among regions, for example, is not necessarily based on desired and intended results on the ground. Investment programming and budgeting have likewise become routinary rather than exercises that ensure the provision of funds needed to achieve results, and that funds are efficient and effective in bringing about desired level of development.

Funds provided by the national government through the General Appropriations Act (GAA) are supplemented by funds coming from Official Development Assistance (ODA). Some ODA-

funded programs are long-term in scope; hence, there might also be a need to evaluate the impact of such programs to ensure efficiency of such funds and interventions.

**Corruption.** The department is not exempted from the practice of corruption. There had been incidents of corruption reported in the past. Big or small, these incidents do not significantly contribute in advancing and promoting the development of the whole

sector. They retard and alter processes and mechanisms, which eventually lead to underdevelopment in many forms.

## Strategic Direction for Governance and Institutional Strengthening and Development

To address the binding constraints and to support the implementation of the NAFMIP, this section presents the objectives and strategies on governance and institutional strengthening and development.

### **Objectives of Governance and Institutional Development**

**General objective.** Governance aims to establish and strengthen institutional arrangements and policy environment for the whole agri-fisheries sector.

**Specific objectives.** The establishment and strengthening of institutional arrangements and policy environment are intended to:

1. Support the implementation of the NAFMIP
2. Respond to the dynamic environments and factors affecting the performance of the agriculture and fisheries sector

Given these objectives, the intention is to establish mechanisms and systems that are responsive to the needs and aspirations of the agriculture and fisheries sector at all times, and more specifically to ensure continuous and sustainable transformation of the whole sector.<sup>29</sup>

### **Overarching Strategy for Governance and Institutional Development**

The transformation of the whole agriculture and fisheries sector shall focus on two inter-related and interdependent levels, i.e., internal and external.

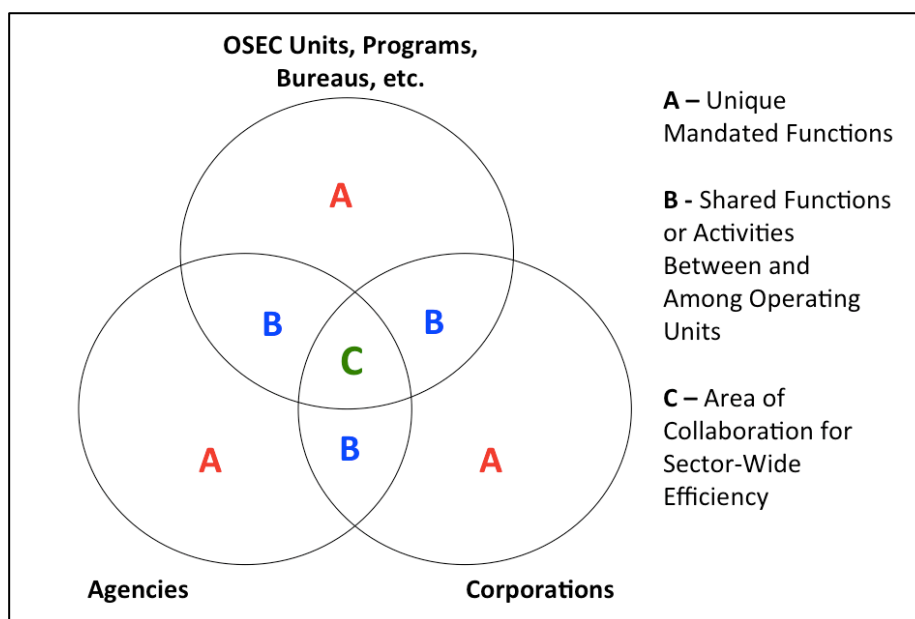
**Internal level transformation.** This strategy reinforces the OneDA Approach. This implies that the operating units of the DA at various levels have similar development directions and that their mandated functions are performed in synch with each other. The overall intention is to promote sector-wide efficiency and effectiveness.

As can be seen in Figure 9.1, the operating units of the DA have their own unique mandated functions (A); they also have shared functions or activities (B); and they have area of convergence or collaboration (C).

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<sup>29</sup>Mechanisms and systems, as applied in this context, refer to processes in delivering goods and services as well as high impact results to clients, beneficiaries and sector stakeholders. At best and in simple terms, they could be described as “ways” of doing things—a mindset—rather than the actual establishment of hard systems and procedures.

**Figure 9.1: Aligning Functions and Areas of Convergence and Collaboration among DA Operating Units**



The most important item in this diagram is the area of convergence or collaboration. Looking at the functions of the operating units, the area of convergence could include the following: (a) plan formulation, policy and regulation development; (b) delivery of extension services (e.g., PAFES); (c) selection and prioritization of priority programs, projects and activities; (d) monitoring and evaluation (of plan implementation, policy enforcement, PPA implementation); (e) information, advocacy, promotion and knowledge management; (f) risk management and climate resiliency; (g) partnership and stakeholder management; and (h) farm and asset management.

**External level of transformation.** The strategy is to enable the participation of all stakeholders in agriculture and fisheries sector modernization and industrialization. This implies the engagement and alignment of thrusts of the OneDA vis-à-vis the development aspirations and priorities of partners and stakeholders. Partners and collaborators include people and other institutions acting as service providers and process facilitators. As can be seen in Figure 9.2, these may include other national government agencies, relevant offices at the local governments, the market and the private sector, the academe and research institutions as well as the civil society groups and associations in the agriculture and fisheries sector. Another important element of this strategy is the beneficiaries, which include the farmers, fishers, livestock raisers (individuals and groups) and the Filipino people.

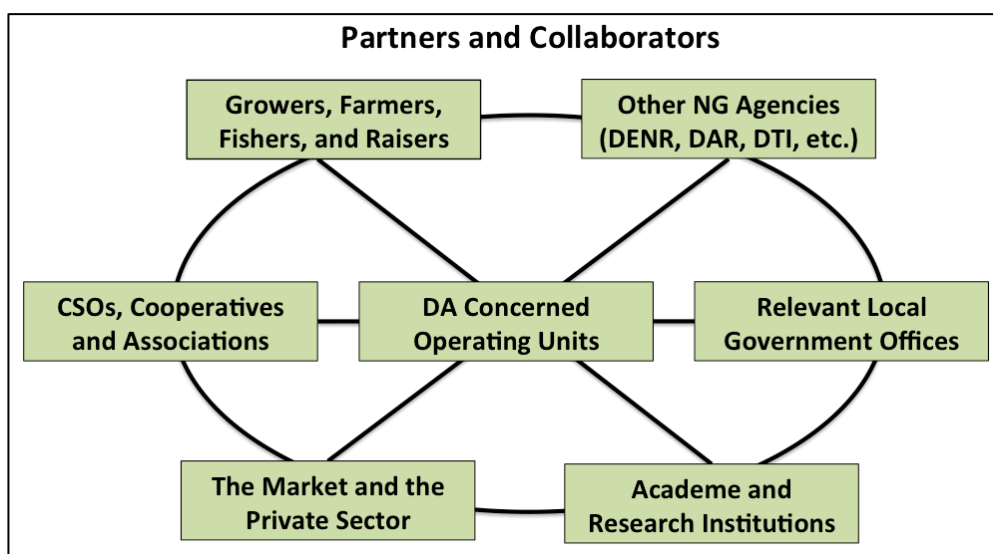
Areas for collaboration among partners could include: (a) capacity building for beneficiaries; (b) extension service delivery; (c) asset development management; (d) program development and implementation; and (e) production, distribution and marketing efficiency.

**Specific Strategies for Convergence, Collaboration and Integration: Internal and External Environments**

As mentioned above, the transformation of the whole sector is dependent on the strength and responsiveness of the institutional mechanism or system, which has two interrelated parts, namely: (a) institutional setup among entities within the department (or the internal institutional environment); and (b) coordinative mechanisms between DA and its operating units, on one

hand, and other stakeholder-organizations, on the other (or the external institutional environment).

**Figure 9.2: DA and its Partners and Collaborators**



For the planning period, strengthening of both the internal and external institutional environments shall be pursued.

***The Internal Institutional Environment***

As regards the internal environment, this means that synergy and coordination among member-agencies of the whole DA family are at the core of institutional capacity building interventions even as they endeavor to do commodity system planning, regional and spatial planning as well as functional planning for service delivery.

Synergy and coordination are best strengthened in the context of the horizontal and vertical integration of the efforts of all concerned offices. At the horizontal front, interventions should enable member-agencies—such as the staff or service units of the department as well as the bureaus, attached agencies and corporations—to work as teams rather than as independent organisms. Thematic and functional areas and mechanisms of convergence, coordination and collaboration should be identified and established, respectively, to promote operational efficiency and cost effectiveness. At the vertical aspect, lines of communication should be properly instituted to ascertain responsibility and accountability at various levels of governance.

Table 9.1 identifies thematic and functional areas of convergence, synergy and collaboration of the various operating units of the department. It also presents how such functions or themes could strengthen institutional linkages of the department as one family.



**Table 9.1: Strengthening Internal Linkages through Thematic and Functional Areas**

<b>THEMATIC OR FUNCTIONAL AREAS OF CONVERGENCE OR COLLABORATION</b>	<b>SPECIFICS OF CONVERGENCE AND COLLABORATION</b>	<b>STRATEGIC FOCUS OF INTEGRATION</b>	<b>SPECIFICS OF INTEGRATION</b>
Direction-setting for the whole sector and respective operating units	How the different operating units align with overall development directions and translate such into specific actions	Horizontal integration	Development direction and actions of operating units are supportive of and consistent with the overall direction set for the whole sector.
		Vertical integration	Overall development directions are adopted by and translated into action plans at lower-level offices
Work/ strategic planning for the whole sector and respective operating units	How overarching vision, development thrusts and priorities are translated across the: (a) different operating units of the department; and (b) various levels of governance	Horizontal integration	Specific work and strategic plans of operating units strongly aligned and consistent with overarching vision, development thrusts and priorities
		Vertical integration	Work and strategic plans of lower level are integrated in higher level plans
Investment programming	Selection, prioritization and programming of high impact, responsive PPAs	Horizontal integration	Integration and packaging of similar and related projects or projects from various operating units with common features to promote cost efficiency and eliminate duplication of activities
		Vertical integration	Identification of PPAs from below and are properly integrated with similar PPAs at higher levels of governance
Project development	Generation and packaging of project proposals based on: (a) responsiveness to sector-wide needs and service gaps; (b) impact in bringing about overall intended results for the sector; and (c) effectiveness on the use of resources.	Horizontal integration	<ul style="list-style-type: none"> <li>• Large scale, high impact sector-wide projects</li> <li>• Collaboration among concerned service units and offices</li> </ul>
		Vertical integration	<ul style="list-style-type: none"> <li>• Nationwide, multi-level responsive projects</li> <li>• Supported at various levels of governance</li> </ul>

<b>THEMATIC OR FUNCTIONAL AREAS OF CONVERGENCE OR COLLABORATION</b>	<b>SPECIFICS OF CONVERGENCE AND COLLABORATION</b>	<b>STRATEGIC FOCUS OF INTEGRATION</b>	<b>SPECIFICS OF INTEGRATION</b>
Monitoring and evaluation	Impact evaluation and cost effectiveness review of PPAs for more rational investment programming and budgeting	Horizontal integration	Coordination with M&E efforts of various operating units and subsectors
Budgeting	Effective determination and allocation of funding requirements for the implementation of PPAs and operation of offices	Horizontal integration	Budget determination and allocation among member-agencies of the DA family based on implementation needs and requirements of identified PPAs
		Vertical integration	Budget determination and allocation employing a mix of acceptable top-down and bottom-up approaches
Fund sourcing for high impact projects	A proactive strategy of funds mobilization for identified high impact and sector wide PPAs	Horizontal integration	Coordination among offices responsible for project development, investment programming and budgeting as well as concerned program offices.
Policy review and development	This is to ensure responsiveness of regulatory regime given the challenges of the time and the need to provide for enabling environment for the implementation of the NAFMIP	Horizontal integration	Coordination with concerned and relevant operating units and program offices, as well as other sector stakeholders
Delivery of extension services at the sub-national level	This is to provide a common ground for extension service delivery and capacity development at the local level.	Horizontal integration	Coordination with concerned and relevant operating units and program offices, as well as other sector stakeholders.
Farm Clustering	Development of scale economies in agriculture and fisheries sector	Horizontal integration	Different programs, offices and services units collaborating in providing assistance to identified focus areas or activities.

### ***The External Institutional Environment***

The external environment includes offices from the executive and legislative branches of the national government, relevant civil society and business sector organizations, national, regional and local coordinating bodies, the local governments, small farmer and fisher formal and informal organizations, and the academe. Areas for strengthening could include points of agency integration, definition of roles and responsibilities, designation of growth hubs and farm or program clustering, and supply chain management.

Table 9.2 summarizes the roles of other stakeholders and how they could be mobilized in effecting development and transformation to the agriculture and fisheries sectors.

**Table 9.2: Strengthening Institutional Linkages with Other Stakeholders**

<b>AGENCY/ ENTITY/ COORDINATIVE BODY</b>	<b>MANDATE</b>	<b>POSSIBLE ROLES IN AGRI-FISHERIES TRANSFORMATION</b>
Department of Trade and Industry	<p>Responsible for realizing the country's goal of globally competitive and innovative industry and services sector that contribute to inclusive growth and employment generation.</p> <p>Responsible in expanding economic opportunities in industry and services, and by increasing the access particularly of micro, small and medium enterprises (MSMEs), and relevant cooperatives, especially in agriculture and fisheries sectors.</p>	<p>Supply chain management</p> <p>Exports and investment development program</p> <p>Industry development program</p> <p>SME development program</p> <p>Improve access to finance, to production networks, and to markets</p>
Department of Agrarian Reform	<p>Lead in the implementation of the CARP through LTI, agrarian justice and coordinated delivery of essential support services to client beneficiaries.</p> <p>Actualize equitable land distribution, ownership, agricultural productivity, and tenurial security for, of and with the tillers of the land towards the improvement of their quality of life.</p>	<p>Delivery of extension service at the local level</p> <p>Asset management</p> <p>Delivery of capacity building at the community level (for farmers), e.g., farm productivity</p>
Department of Environment and Natural Resources	<p>Responsible for the conservation, management, development and proper use of the country's environment and natural resources, specifically forest and grazing lands, mineral resources, including those in reservation and watershed areas, and lands of the public domain, as well as the licensing and regulation of all natural resources as may be</p>	<p>Delivery of extension service at the local level</p> <p>Asset management and use</p> <p>Delivery of capacity building at the community level (for farmers), e.g., farm productivity</p>

AGENCY/ ENTITY/ COORDINATIVE BODY	MANDATE	POSSIBLE ROLES IN AGRI-FISHERIES TRANSFORMATION
	provided by law in order to ensure equitable sharing of the benefits derived therefrom for the welfare of the present and future generations of Filipinos.	
Department of Science and Technology	Provides central direction, leadership and coordination of scientific and technological efforts and ensure that the results therefrom are geared and utilized in areas of maximum economic and social benefits for the people.	Development and application of food processing technology  Product packaging, labeling, branding  Coordination of product certification/ accreditation
Technical Education and Skills Development Authority	Provides direction, policies, programs and standards towards quality technical education and skills development.	Provision of capacity development programs in food processing
State Universities and Colleges	Provide advanced education, higher technological, professional and vocational instruction and training  Promote and undertake research and extension services in support of sector development	Technical and knowledge-based support to farmers and fishers  Provision of capacity development programs
Local Chambers of Commerce and Industry	Promote interest in local business possibilities  Promote economic welfare of the community  Professional development	Industrial and business development  Assistance to businesses with the latest marketing and promotional techniques  Provide a variety of services that could help transform the agriculture and fisheries sectors
Federations/ Associations of Local Farmers and Fishers	Provision of assistance to farmers and fishers in terms of extension services, access to funding and credit facilities, and marketing of products	Assist government to work out agri-fisheries development plans  Facilitate agri-fisheries extension  Provide supply and marketing services  Supply farm credit

AGENCY/ ENTITY/ COORDINATIVE BODY	MANDATE	POSSIBLE ROLES IN AGRI-FISHERIES TRANSFORMATION
		Capacity development of farm leaders
Local government units	<p>Extension and on-site research services and facilities related to agriculture and fishery activities</p> <p>Assistance in the organization of farmers and fishermen's cooperatives, and other collective organizations</p> <p>Transfer of appropriate technology</p> <p>Industrial research and development services</p>	<p>Policy direction for the sector at the local level</p> <p>Provision of extension services</p> <p>Farm cluster management</p> <p>Establishment of coordinative mechanisms at the local level (e.g., the PAFES)</p>
Relevant coordinating committees at the sub-national levels	<p>Collaborative decision making and policy direction setting</p> <p>Consensus building and working together to get things done</p>	<p>Policy direction setting</p> <p>Plan formulation</p> <p>Project development and investment programming</p>
Financial institutions	<p>Provision of funding assistance and support to agri-fisheries transformation</p> <p>Assistance to farm/fishery and asset management and development</p>	Provision of credit facility for start-up agribusiness endeavors
Insurance companies	<p>Crop insurance</p> <p>Farm/fishery risk management</p>	Risk management and resiliency
Logistics and transport service providers	Product distribution and channeling	<p>Transportation of goods</p> <p>Product marketing and distribution</p>
Legislators (at all levels)	<p>Formulation of laws, policies and regulatory measures</p> <p>Authorization of spending</p> <p>Review of policy enabling environment</p>	Formulation and development of relevant rules and policies to support the transformation of the sector and in the implementation of the NAFMIP

## Areas of Capacity Development in Support of a Transforming Sector

Table 9.3 presents broad areas of capacity development for duty bearers and beneficiaries.

**Table 9.3: Areas of Capacity Development**

INSTITUTIONS AND BENEFICIARIES	AREAS OF CAPACITY DEVELOPMENT
DA OUs and DA Partners and Collaborators (various levels)	<ul style="list-style-type: none"> <li>• Sector planning</li> <li>• Priority commodity planning and analysis (local)</li> <li>• Strategic and operational planning</li> <li>• Project development and planning</li> <li>• Investment programming (across OUs and across concerned partner national government agencies)</li> <li>• Monitoring and evaluation (of plan implementation, policy enforcement and PPA implementation)</li> <li>• Project and program management</li> <li>• Marketing and promotion (sector-wide, OU-specific, area-focused)</li> <li>• Extension service delivery efficiency</li> <li>• Resource sharing for sector-wide efficiency</li> <li>• Program and project appraisal and assessment</li> <li>• Climate resiliency (in production, distribution and marketing)</li> <li>• Digital marketing</li> </ul>
Beneficiaries	<ul style="list-style-type: none"> <li>• Farm and asset management for productivity</li> <li>• Farm clustering and integration for resource use efficiency and effectiveness</li> <li>• Farm mechanization technologies</li> <li>• Application of digital technology in production, distribution and marketing</li> <li>• Practices in increasing productivity</li> <li>• Sustainable agriculture and fisheries activities at the household and small community levels (i.e., non-reliance to loans and credits)</li> </ul>

### Cross-cutting Agenda for Further Studies, Policy, and Institutional Transformation

The following are selected agenda items for further studies and policy development related to governance and institutional development:

1. **Review of coordinative mechanisms or bodies** created in the past with the intention of streamlining or minimizing the number of such bodies. This may require redefining their functions and mandates and realigning similar ones. There are about 30 coordinative bodies created in the past for the agriculture and fisheries sector.
2. **Preparation of transition plan and establishment of enabling policy environment** for a more cohesive interdependence between the DA (plus its partners and collaborators) and the LGUs in the context of the Mandanas ruling of 2018.
3. **Specific definition of roles and commitments of key duty bearers** in the transformation of the agriculture and fisheries sector (specifically in support of NAFMIP implementation). These duty bearers may include: (a) the DA and its operating units; (b)



the private sector; (c) other concerned NGAs; (d) the local government units; (e) the legislators (both national and local); (f) the academe and research institutions; and (g) concerned and relevant civil society organizations and groups.

4. **Policy environment** related to the following: (a) ease of doing business related to agriculture and fisheries (application of RA 11032 to agriculture and fisheries); (b) investment incentives for agriculture and fisheries; and (c) inter-LGU investment generation and promotions.
5. **Strategic integration of communication and advocacy in institutional development** undertakings. This implies that efforts related to institutional capacity assessment and strengthening should be deliberately considered as opportunities to communicate sector transformation and development to various audiences. Given this, communication and institutional strengthening should be seen as continuous and progressive collaborative efforts.

## Implementation of Governance and Institutional Transformation

As mentioned earlier, a portion of Governance and Institutional Transformation is intended as an implementation mechanism for the NAFMIP and a plan in itself that needs to be implemented to lay an enabling environment for a transformed agri-fisheries sector. Hence, Table 9.4 presents the strategies for its implementation:

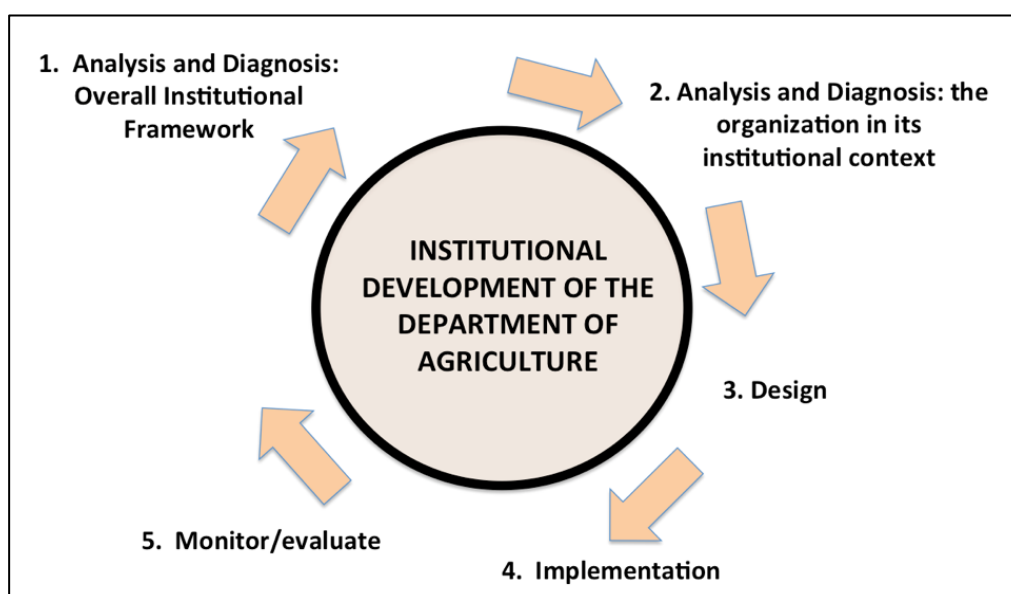
**Table 9.4: Strategies for Implementing Governance and Institutional Transformation**

STRATEGIES	DESCRIPTION
Phased implementation of activities	<ul style="list-style-type: none"> <li>• Three phases: short-, medium-, and long-term periods</li> <li>• Well-planned set of reinforcing activities per phase</li> </ul>
Tangible and high impact deliverables and milestones	<ul style="list-style-type: none"> <li>• Focus on organizational development based on careful assessment and diagnosis</li> <li>• Well-established processes and structures</li> <li>• Needs-based and transformation-responsive interventions</li> </ul>
Well-identified change movers and change owners	<ul style="list-style-type: none"> <li>• Who will do what?</li> <li>• Clear delineation of responsibilities within DA – to avoid mediocrity and promote proactivity</li> <li>• Enable responsibility and accountability</li> <li>• Issuance of mandate to act (for all possible areas of intervention)</li> </ul>

The process of implementing institutional development at the Department of Agriculture follows as cyclical process, as shown in Figure 9.3.

Given the implementation strategies and the institutional development process as presented above, major activities that should be implemented by the Department are summarized in Table 9.5.

**Figure 9.3: Institutional Transformation Process**



**Table 9.5: DA Activities for Implementating Institutional Transformation**

<b>SHORT-TERM</b> (1-3 years)	<b>MEDIUM-TERM</b> (4-6 years)	<b>LONG-TERM</b> (beyond 6 years)
<ul style="list-style-type: none"> <li>• Analysis and diagnosis (multi-level)</li> <li>• Redefinition of coordinative mechanisms at the national and sub-national levels</li> <li>• Detailed change planning</li> <li>• Issuance of mandates (change owners and coordinative mechanisms)</li> <li>• Mainstreaming of structure and process strengthening</li> <li>• CBNA (internal and external)</li> <li>• Design, prioritization and conduct of CB Program</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous practice of internal strengthening interventions</li> <li>• Continuous practice of external strengthening interventions</li> <li>• Monitoring and evaluation of institutional transformation activities (internal and external)</li> <li>• Continuous institutional transformation</li> <li>• Continuous conduct of CB Program</li> </ul>	<ul style="list-style-type: none"> <li>• Continuous practice of internal strengthening interventions</li> <li>• Continuous practice of external strengthening interventions</li> <li>• Monitoring and evaluation of institutional transformation activities (internal and external)</li> <li>• Continuous institutional transformation</li> <li>• Continuous conduct of CB Program</li> </ul>

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## CHAPTER 10

### Lessons Learned from the Monitoring and Evaluation Practices of Previous Agri-Fisheries Sector Plans<sup>30</sup>

**A**FMP 2017-2022 and AFMP 2018-2023 are the predecessors of the ongoing NAFMIP. This Section assesses the monitoring and evaluation practices applied to these previous Plans in order to generate insights for the design of the Monitoring and Evaluation (M&E) for the NAFPMIP. Findings are taken from two studies: the M&E Assessment Study of AFMPs conducted by the author as FAO ASMES and the M&E findings in the Sector Assessment Report conducted by Orient Integrated Development Consultants.

#### Findings from Sector Assessment Report

In preparation for the formulation of AFMP 2018-2023, a Sector Assessment Report was conducted by the Consultants and Planning Team (OIDC, n.d.). Their findings were synthesized from consultations with Central Office personnel as noted in the following statement, “Following consultations with the DA-PMS and the DA-PRDP staff and based on the Team’s assessment, lessons, experiences and preliminary areas for consideration are discussed below” (OIDC, nd, p. 67). Gaps in the monitoring and evaluation practices relative to the AFMPs were clustered around four topics as shown in Table 10.1.

**Table 10.1: Summary of Findings on Gaps in M&E of AFMPs**

TOPIC	FINDINGS
Results Framework	.... the previous Plan has no definitive results framework that forms the basis of M&E; this did not allow development of a system to monitor and evaluate during plan implementation.
M&E Activities	Absence of an accompanying M&E system did not allow serious attention to M&E activities during plan implementation. The previous AFMP made provisions for monitoring and evaluating plan implementation, but the absence of an accompanying system did not allow regular tracking of progress of planned activities and plan performance based on key indicators. In the absence of an M&E system, evaluation activities were not identified and evaluation methodologies were not developed. The lack of coordination between the RFUs and the LGUs in monitoring the previous AFMP was not addressed. Resources for M&E activities were limited.
Baseline Data	The lack of an underpinning results framework and accompanying M&E system and resources disabled the identification of baseline data requirements, planning for baseline data collection, and conducting a full baseline survey. Resources allocated to surveys were limited. The sporadic surveys to capture baseline data were carried out under specific projects but were not sufficient to allow a thorough evaluation of the previous plan.
Evaluation	A full evaluation of the previous AFMP was not carried out.

<sup>30</sup>Prepared by Brenda B. Furagganan, Agriculture Sector Monitoring and Evaluation Specialist, FAO

## Findings from the M&E Assessment Study

The M&E Assessment Study findings were synthesized from the results of a review of current monitoring reports, results of the online survey administered to Planning and M&E Chiefs and Section Chiefs and from the results of the Key Informant Interviews completed with selected respondents from the Central Office Operating Units, Regional Field Offices and attached agencies. The M&E gaps highlighted in the previous Sector Assessment Report were not only validated in the M&E Assessment Study but a more comprehensive description of M&E practices in the Sector were revealed.

These gaps are clustered into five key themes (under the acronym SPORT): systems; people; outcomes; resources; and technology.

### Systems

The Study showed that M&E systems within the DA hierarchy is characterized by high fragmentation, resulting in several duplication and overlapping of M&E activities. Three examples are presented to illustrate this finding.

First, there appears to be **no unified policy and guidelines on how to conduct the M&E activities**. Several of the RFOs noted that they created their own data capture forms or that they revised data capture forms provided by the CO to suit their requirements. Moreover, RFOs set their own criteria for field visits. For instance, one RFO conducts field visits to all projects, another visits only projects that were reported completed while another visits only those that are “problematic” or only 20% completed. While this in itself is not a problem, the lack of a common systematic manner for selecting projects to be validated through field visits prevents at the very least a generalization of projects at regional level and at most a comparative analyses among regions. This practice is also paralleled by the different Operating Units at the Central Office. Each Unit has their own criteria on how and when to undertake field visits of projects monitored by their Offices.

Second, **each Operating Unit at the Central Office maintains its own respective databases and data are not shared** among these different platforms. The result is that RFOs submit reports to different offices using **different templates even if some data are similar**. RFOs also noted that even though they contribute data to the CO databases, they **have no or limited access** to it. In addition, because there is no centralized database for information, various requests for data from other government agencies (e.g., NEDA, Congress, Governors) and private sector (e.g., researchers) requesting for similar data but using different templates take up considerable time of the limited M&E personnel.

The third critical gap in the M&E system is the **lack of a standard method for calculating data for indicators** (which may be related to an absence of guiding policy). For instance, when asked how RFOs compute the increase in incomes of individual farmers, respondents provided different assumptions in their calculations. This means that income as an indicator cannot be compared across the different RFOs.

Lastly, although several respondents mentioned the different good practices introduced by PRDP and other foreign-funded projects, adoption is still low as one regional respondent observed, “...*hindi pa masyadong na-mainstream yung systems na ina-adopt ni PRDP dito sa DA.*”

## **People**

There is **uneven capacity in M&E** in the DA personnel not only among the staff but within middle management. This unequal understanding of the concepts of monitoring and evaluation is illustrated with two anecdotes.

Asked how monitoring is normally done by their Office, a CO respondent who is a middle manager, enumerated the different project activities that are in their pipeline under their Office. This illustrates not only a low understanding of M&E but also of how monitoring is generally equated with activities.

In contrast, when informed that some RFOs claim that they do not track outcomes, an RFO respondent, who is also a middle manager, explained that there are different levels of outcomes and stated that RFOs do indeed track lower level outcomes without being aware of it but not higher level outcomes. The RFO respondent noted, "They only say that they don't track outcomes. They monitor change in yield, isn't that an outcome?" The statement illustrates a higher level of competency on M&E.

An observation by one respondent succinctly describes the situation: "I have spent over three decades in Planning, there is no course for that (referring to M&E). No one here has studied planning, monitoring, evaluation. That is why we only learn by doing. Sometimes we have training. I have one Section Chief of M&E Section that is very good but this is only because we sent the person to an Executive Course and not M&E. Our competencies are only based on experiences."

## **Outcomes**

The M&E Assessment Study also revealed that **low priority is placed in tracking outcomes**. Respondents noted that DA regularly conducts midterm or annual program assessments wherein progress is reviewed. However, it was also noted by a few respondents that the primary focus of these assessments is on how money was spent, not on what outcomes were achieved. One RFO respondent also noted that only about a dozen indicators are given priority during these meetings despite the regions producing many other indicators.

In contrast, another RFO respondent preferred that only a few indicators are reported. Because their volume of work is so high, they only focus on the "big ticket items". Several respondents also noted that they do have very good Regional AFMPs particularly since these go through a rigorous process of consultations. However, when all is said and done, the RAFMPs sit on the shelves because M&E activities are only aligned with the Annual Plans, i.e., accomplishments are compared only with the annual plans and are not reverted back to the RAFMPs.

In the case of the CO respondents, alignment of program accomplishments with the AFMPs is **assumed** given that no evaluations are conducted.

## **Resources**

The **insufficiency of resources to undertake M&E activities** were shared by RFOs and CO OUs alike. The insufficiency of resources for use in M&E activities has been aptly described in the previous sector assessment report. These were still very much evident in the recent M&E assessment done and thus will not be belabored. However, to emphasize this theme, several quotes are provided:



- “Our schedule for field monitoring has to coincide with the field visits of the banner programs because we have no vehicle for our own use. Most of the time we are also low in the priority to use the office vehicle.”
- “*Meron naman kami* (referring to cellular phones) *pero kulang, at saka ngayon, mabilis yung technology, luma na yung amin, may mga bago na.*”
- “*Mayroon din silang sariling work load* (referring to LGU personnel), *pero meron din naman talagang tinutulungan kami* (to conduct monitoring)...”
- We cannot cope with all the responsibilities given to us especially during this pandemic; there are so many reports demanded by the Central Office.

### **Technology**

Closely linked to the lack of resources for M&E is the **inability to optimize the use of technology** for M&E. The lockdowns or community quarantines that were products of the spread of the Covid-19 virus brought to fore the critical role of technology, particularly the internet, in sustaining work operations in both public and private organizations. In the case of M&E, field visits or project validation were significantly reduced if not totally stopped as a result of the pandemic. Many organizations resorted to remote or online M&E. However, respondents reported that they haven’t optimized the use of technology for M&E.

For instance, one respondent noted how helpful the Philippine Rice Information System (PRISM) was when it was pilot-tested. However, the respondent couldn’t account for the reason why it hasn’t been widely used by all RFOs to date. Another respondent also noted that they can use drones for monitoring but that they need to borrow the drone from the banner programs.

In sum, the M&E Assessment Study confirmed the following:

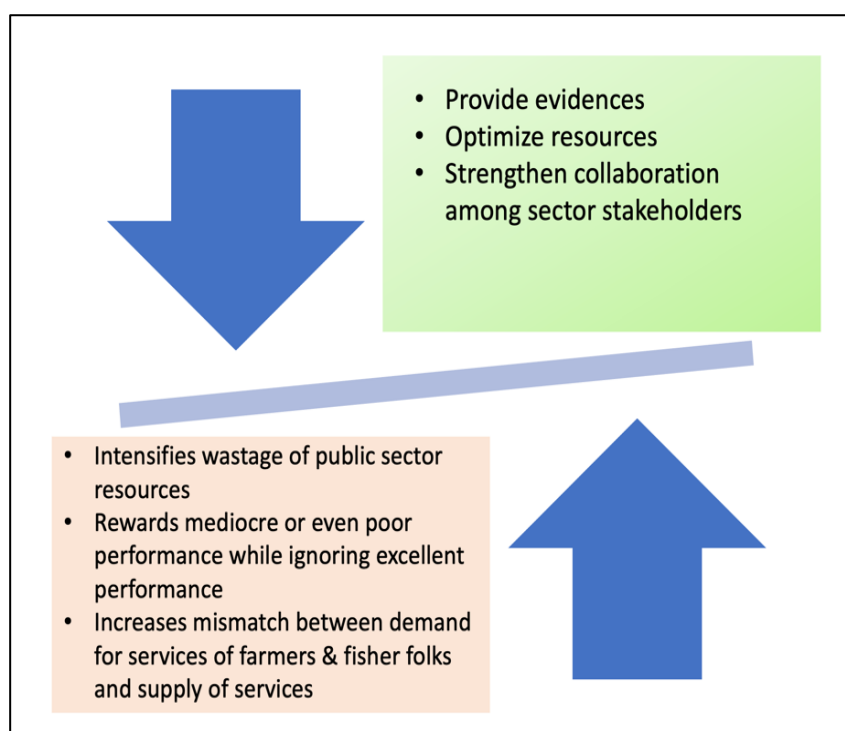
1. There is general opinion that alignment between the national AFMPs and the Regional AFMPs and agency development plans is robust.
2. However, there is consensus that the primary focus of the OUs and RFOs are their respective annual plans, which are not necessarily aligned to their respective AFMPs, RAFMPs or Agency Strategic Plans (due to the amendments, adjustments and insertions that consequently happens across the budget process.)
3. There is also consensus that accomplishments are not compared back to the respective AFMPs, RAFMPs or agency strategic plans, i.e., no plan evaluations are conducted. The assumption and perspective that all accomplishments in the AF sector contribute to the execution AFMP is generally accepted in the sector.

### **Supporting AF Sector Transformation: M&E Potentials and Constraints**

Results-based monitoring and evaluation (RBME) is widely considered in the development community as one of the pillars for a development sector transformation initiative. As such, it remains one of the most critical ingredients for the transformation of the agriculture and fishery sector from its current state to one that is not only modern and industrialized but sustainable, resilient and empowering.

**How, then, can an effective M&E contribute to the AF sector transformation?** Based on the discussions in the preceding section, **M&E can potentially contribute significantly in three areas** to enhance the transformation of the agri-fishery (AF) sector as detailed in the NAFMIP (Figure 10.1).

**Figure 10.1: Monitoring and Evaluation (M&E) Potentials and Constraints in Supporting the Agri-Fishery Sector Transformation**



An **effective** NAFMIP M&E can:

1. Provide key evidences (*i.e., science and empirical based*) to substantiate investment decisions and assess performance of AF policies, programs and projects;
2. Enable the optimization of people, time and resources in DA across governance levels by eliminating duplication and overlapping of work; and
3. Strengthen collaboration among sector stakeholders by enhancing transparency, accountability and ownership.

On the other hand, **how can an ineffective M&E constrain AF sector transformation?** There are also **three key constraints** highlighted to illustrate how an ineffective M&E can hinder the transformation of the Agri-Fishery Sector.

An **ineffective** NAFMIP M&E:

1. Intensifies wastage of public sector investments and resources all along the various value chain;
2. Rewards mediocre or even poor performance while paying little attention to excellent performance as well as best practices; and
3. Escalates unmet needs of farmers and fishers because the dearth of quality feedback increases mismatch between demand of farmers and fishers for programs and services vis-à-vis their supply.

Obviously, policy and decision makers have to judiciously balance the pros and cons of increasing investments in RBME in the AF sector. In the end, however, as in all development interventions, the price of poor sector RBME is ultimately paid by the sector beneficiaries, which in this case are the smallholder farmers and fishers.

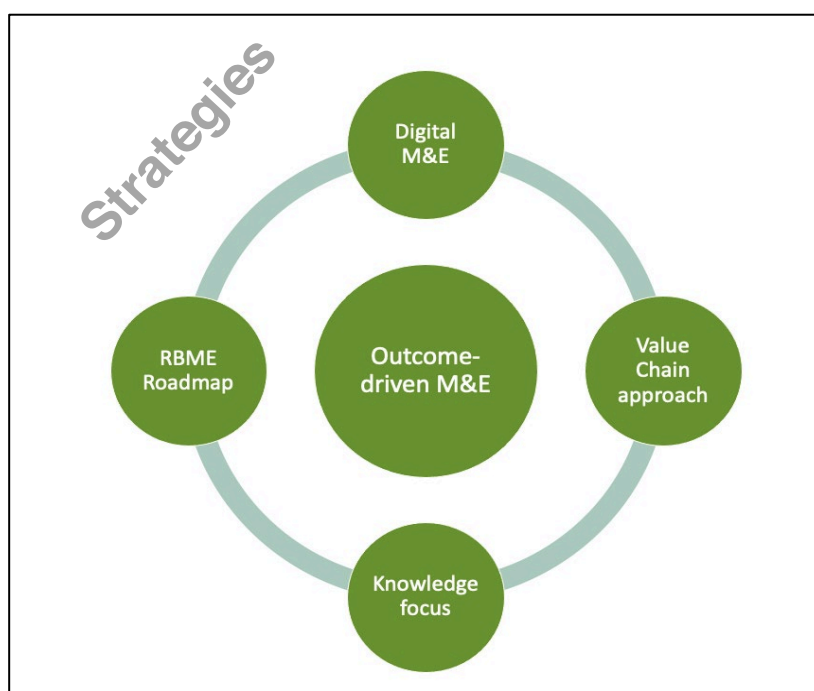
## Aligning M&E Strategies with DA New Thinking

Five M&E strategies, aligned with the **DA New Thinking** and the **OneDA Approach**, will characterize the NAFMIP M&E system. The proposed overarching strategy is termed an **outcome-driven M&E** (Figure 10.2). Four other strategies support the central strategy: RBME roadmap; digital M&E; value chain approach; and knowledge focus. Each of these strategies can be used as entry point to building an effective NAFMIP M&E system.

An **outcome-driven M&E** places premium on the results of interventions in tracking the positive changes that take place in the lives of farmers and fisher folks as well as other stakeholders and beneficiaries. This contrasts with the traditional and commonplace M&E following the input-output approach. To illustrate, the input-output M&E is explained by the following template question: How many **seeds/fertilizers/ machines/credit/insurance** were distributed/given to farmers/fishers? On the other hand, an outcome-driven M&E asks, “How did the **seeds/fertilizers/machines/ credit/ insurance** given to the farmers/fishers **improve their lives?**” This overarching strategy is closely aligned with the OneDA strategy no. 1.

A NAFMIP M&E system guided by an **RBME roadmap** overcomes the fragmentation in the current M&E systems in at least three ways: by establishing a network of results framework and logframe across the agri-fishery network; identifying the institutional arrangements for M&E reporting; and establishing the resource requirements (budget and people) for M&E. The RBME roadmap should give clarity in terms who, what, when, and how to monitor and evaluate. The roadmap can also identify how to “mobilize and empower partners” to accomplish M&E goals in accord with OneDA strategy no. 8. Alongside the OneDA cross-cutting Strategic Communication support, the roadmap can also indicate how M&E results are communicated to internal and external stakeholders and the ways in which M&E results are utilized.

**Figure 10.2: M&E Strategies to Support the AF Sector Transformation**



The third strategy, **digital M&E**, aligns with the modernization paradigm as well as the OneDA strategy no. 6. It refers to a NAFMIP M&E System that fully optimizes the application of technology to increase efficiency in the different M&E processes such as data collection, data analysis, and reporting.

**Value chain approach** adopted by the NAFMIP M&E system strives to identify the value adding features at each governance level within the DA hierarchy. This will build synergy between and among OUs within the DA family. A value chain approach to M&E would force the spotlight to the level of utilization of M&E results.

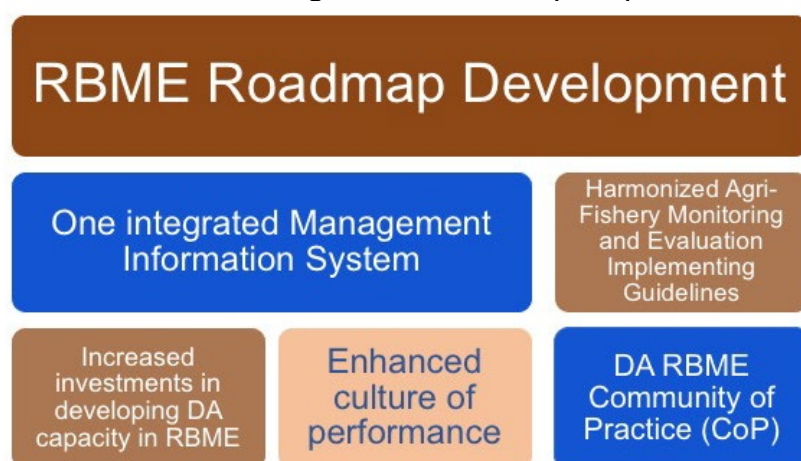
Moreover, a value chain approach to M&E also entails tracking down recommendations from M&E findings to determine management actions on the recommendations.

**Knowledge-focused M&E** emphasizes the role of M&E in building and diffusing knowledge within the sector and advocating for innovations rather than maintaining ineffective systems or preserving status quo. Knowledge-focused M&E also directs the spotlight on the need for a robust Research and Development (R&D) in the AF sector.

### Recommended Policies and Programs/ Projects on M&E

From the assessment findings and within the timeframe of the NAFMIP implementation, the following policies, programs, and projects (PPPs) are strongly recommended to respond to the identified gaps in the AF sector M&E system. These six PPPs are proposed in no particular order as each may be considered as components of one encompassing RBME intervention. Each one can also be considered as an entry point (i.e., first step) toward enhancing overall M&E system of NAFMIP. The recommendations are mapped in Figure 10.3.

**Figure 10.3: Recommended Policies, Programs and Projects for NAFMIP Monitoring and Evaluation (M&E)**



This first recommended intervention is the formulation of a **OneDA RBME roadmap**. The intention of the RBME roadmap (may also be viewed as a sector M&E Plan) is to craft a medium-term national strategy for enhancing RBME in the agri-fishery sector. The Roadmap includes defining a unified set of desired outcomes (i.e., Results Framework), identifying institutional arrangements for M&E (e.g. creation of a NAFMIP M&E Team or deputizing external institutions for M&E), identifying the major steps or milestones needed to attain outcomes, identifying the resources—budget and people—needed to undertake M&E activities, determining how technology is applied in M&E (e.g., geotagging) and identifying how M&E results will be used to build knowledge or enhance policies.

Another key intervention is the formulation and promulgation of **harmonized agri-fishery monitoring and evaluation implementing guidelines** which would be based on the strategies outlined in the DA RBME roadmap. The IG is intended to minimize duplication and overlapping of M&E activities across the different governance levels of DA. To illustrate, the criteria for selecting local projects to monitor as well as the number of projects to monitor are decided by each Operating Unit. The set of criteria are often based on convenience, owing to the limited available resources for M&E activities. One advantage of a unified set of criteria is the facilitation of comparative analysis among the different AF projects irrespective of which OU implemented it.

A third recommended initiative is the establishment of a **OneDA integrated management information system (MIS)** that encompasses all DA programs and projects. At the very least, the proposed integrated MIS should be able to allow users from different OUs to access data from the different stand-alone information systems (IS) to generate reports. At its best, it should enable even the farmers and fishers to participate in monitoring and evaluation by allowing them to access their own profiles in the DA database and validate the products and services received that are reflected in their records. This is feasible since all the sector beneficiaries are expected to have their respective Identification Numbers through the RSBSA or FFRS.

All development plans must be supported by appropriate financial investment. Thus, the fourth recommended policy is the **increased investments in sector M&E to strengthen DA capacity in RBME** according to the DA RBME Roadmap. Investments are required not only to build human resource capacity and expertise but also to build M&E capacity in terms of acquiring technology (e.g., mapping apps) and tools (e.g., smart phones).

Having a robust M&E system is wasted unless its products and outputs are used in improving sector and DA operations. However, there is a need to motivate people to view M&E as a knowledge-building scheme rather than as a “fault-finding” exercise. Thus, the fifth recommended initiative is to **advocate a culture of performance within DA by emphasizing evidence-based policy and decision making and the strict utilization of RBME results**. This includes utilizing evidences generated from research.

The sixth recommended intervention is the **creation of a DA RBME Community of Practice (COP)** within the DA hierarchy to provide a venue for knowledge sharing on M&E best practices or M&E tools and to provide some sort of a “help desk” for M&E personnel facing challenges related to M&E. This is also a mechanism to sustain and build on the gains on M&E interventions from various overseas development assistance (ODA)-funded and other locally-funded special projects.

## Reference

OIDCI. n.d. *Assessment of the Sector Performance and AFMP 2011-2017 Implementation*. Sector Assessment Report under the Project on Formulation of the Agriculture and Fisheries Modernization Plan (AFMP) 2018 – 2023. Orient Integrated Development Consultants Inc. and World Bank with the Department of Agriculture, Philippines.



## CHAPTER 11

# Multi-Level, Multi-Directional, and Multi-Platform Communication toward Agri-Fisheries Sector Transformation<sup>31</sup>

### Introduction

The Agriculture and Fisheries Modernization Program (AFMP) has been gaining support through the years from various stakeholders in the AF sector—from farmers and fishers, local governments, investors, development partners and funding agencies, and the private sector.<sup>32</sup> Legislators and other policy makers in government, as well as key leaders from civil society to include the academe, and some non-government organizations have also advocated the principles of the AFMP. With emerging challenges to the country's food and nutrition security and other socio-economic and political developments, the agency, through the OneDA Reform Agenda, is working toward more sustained, inclusive and meaningful collaborative work between the DA, its stakeholders, and partners as envisioned in Republic Act 8435 or the Agriculture and Fisheries Modernization Act (AFMA) of 1997.

The DA has also been expanding its communication outreach to a wider range of audiences and stakeholders using traditional and digital media platforms, combined with engagement activities such as roadshows, consultations, workshops and other public fora. This is evident from growing media attention and coverage from community papers to major print, broadcast, and social media networks on related themes on food security and increasing incomes and productivity in the sector. Extension services in the area of promoting knowledge-sharing has also made some gains with the adoption of online channels by both government and key stakeholders. However, the government still needs to work on plugging the information gap in agri-fisheries, which according to the UN FAO, is among the leading challenges in sustainable food production.

This preliminary evaluation takes a look at the lessons learned, as well as potentials and constraints in communicating and engaging with stakeholders from the previous AFMP. The rapid assessment also reviews the communication strategies and approaches with intended audiences, engagement with stakeholders, and communication in the extension services system. It further discusses indicative policies and practices employed in communicating with the general public aligned with the OneDA Reform Agenda. Lastly, the assessment provides recommendations through the lens of communication for development of the FAO.

The assessment employed a desk review of related literature to include the AFMP (2011-2017 and 2018-2023), Communication Plan of the Philippine Rural Development Project (PRDP), and related studies from development agencies that reviewed communication practices within the extension services.

Informal face-to-face and online interviews with the DA communication team and consultants, supporting units, attached agencies, and members of the academe were also conducted. In addition, online interviews and surveys, face-to-face interviews, and focus group discussions

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<sup>31</sup>Prepared by Justine E. Letargo, Agriculture Sector Communications Specialist, FAO

<sup>32</sup>NAF Council Voices Support for AFMP 2011-2016. (Oct-Dec 2011). *NAFC Quarterly*. Vol. 13 No. 4



(FGDs) were carried out in January to March 2021 with municipal agriculture officers, agri-entrepreneurs, and smallholder farmers and fishers from Quezon, Iloilo and Cebu City. An initial consultation was held in July 2021 with the DA’s planning, communication, and stakeholder engagement teams as well as supporting units, which yielded important insights toward developing the communication component of the NAFMIP.

## Lessons Learned

The following are some insights emerging from AFMP 2011-2017 and 2018-2023 and PRDP covering four main areas:

1. *Communication in the AF sector has a diverse set of audiences, stakeholders and partners requiring a more inclusive, organized and strategic approach.*

Earlier iterations of AFMPs had regularly indicated a range of communication strategies and outreach activities to inform ‘all stakeholders and the general public’ in the spirit of transparency and accountability with the Plan implementation and progress.

The AFMP (2011-2017) had embedded separate and distinct communication strategies and stakeholder engagement approaches throughout the plan components and sub-components including for regional plans, summarized in Table 11.1 below.

**Table 11.1: Communication Strategies and Stakeholder Engagement Approaches within the AFMP**

<b>COMPONENT/ SUB-COMPONENT</b>	<b>COMMUNICATION STRATEGY</b>
Investment in Public Goods	Adoption of training, extension and communication approaches and strategies for supporting smallholder entrepreneurs engaging in post-harvest handling and processing business ventures
Research, Development and Extension	Production of information, education, and information materials as well as other communication tools for dissemination through mass media
Regulatory Services	Integration of risk communication in systematic and objective risk analysis
Policy and Planning	Dissemination of statistical reports through mass media and official websites; implementation of a communication program to disseminate information on credit, guarantee, and insurance policies
High Value Crops Development	Dissemination of technology packages on quad media including digital platforms; and adoption of training
Livestock and Poultry	Development of a communication program to promote awareness on technologies and generate support on issues

Source: AFMP, 2011-2017

The AFMP (2018-2023) contained a separate section for communicating the plan that involved the following outreach activities designed to apply to the Regional Agriculture and Fisheries Modernization Plans or RAFMPs:

- a. Reproduction and dissemination of hard and soft copies to DA operating units and key stakeholders;
- b. Publication of the plan and progress reports in print media and websites;
- c. Production of IEC materials about the plan; and

- d. Presentation of the plan to stakeholders in consultations and other fora.

Implementation of the communication plan, however, had not been fully carried out for the recent AFMP according to the DA, based on interviews with officers and staff from the Communications team, the Agriculture and Fisheries Information Division, the Office of Planning and Monitoring Service (PMS) and the Planning and Programming Division (PPD). Staff shared how the past plan dissemination had been limited to sending photocopies and online links to the document upon request, which mostly indicates one-way communication with audiences.

Communicating progress of the plan implementation with stakeholders was meanwhile conducted via face-to-face consultations and meetings facilitated by the National Agriculture and Fisheries Council (NAFC) supported by the Philippine Council for Agriculture and Fisheries (PCAF). Asst. Secretary Agnes Miranda underscored the relevance and necessity of more effectively communicating the Plan during a recent consultation on Communicating the NAFMIP, “because there’s been a lot of effort and development that has happened in the sector, but in terms of communication, it is really necessary to inform stakeholders to solicit feedback whether positive or negative.”

Consultations with the DA communication, stakeholder engagement and supporting units also highlighted the need to conduct an internal check of the organization’s set-up and capacity to effectively implement the communication component, given the size of the bureaucracy with implementors from the central office, to the regional field offices, attached bureaus, agencies, and corporations.

Another useful insight that has emerged from AFMP is the value of coordinating with relevant agencies in government and the private sector for launching parallel information campaigns on specific programs. Past campaigns on the Avian Influenza Protection Program and the El Niño Mitigation are good examples of cooperation between the DA, the Philippine Information Agency, and private sector groups which have helped manage and address pressing issues affecting the sector.

Aside from building on the earlier communication outreach activities of the AFMPs, developing the communication component for the successor NAFMIP may also consider lessons from the DA-PRDP. In charge of producing information, education, and communication (IEC) materials and managing advocacy for the project, the Information, Advocacy, Communication and Education Unit (InfoACE) is aware that the nationwide scope of the project demands a well-planned and results-oriented strategy, given limited resources. Below are some key insights culled from their communication plan and evaluation:

- a. Improvement of internal communication among national, provincial and regional coordinating offices through an open feedback mechanism aimed at facilitating the flow of ideas for content creation;
- b. Appointment of a focal person for addressing project component or unit-specific concerns;
- c. Adoption of standards for the quality, delivery, and packaging of content for IEC and advocacy materials consistent with the PRDP style guide;
- d. Targeting of grassroots stakeholders through localized materials and activities to help spread awareness and mobilize action on rural development innovations and interventions; and
- e. Creation and strengthening of a corps of advocates at the regional and provincial levels to help achieve the project’s objectives.

Over the course of the World Bank-funded project’s implementation in the past five years, the InfoACE Unit, with locations across the country, was saddled with administrative and logistical

concerns, as well as issues with simplifying technical content for its audiences. Hence, the Unit has been planning to maximize its available resources and manpower by employing solid principles in strategic communication planning—guided by a clear set of objectives that are specific, measurable, and achievable within a timeframe.

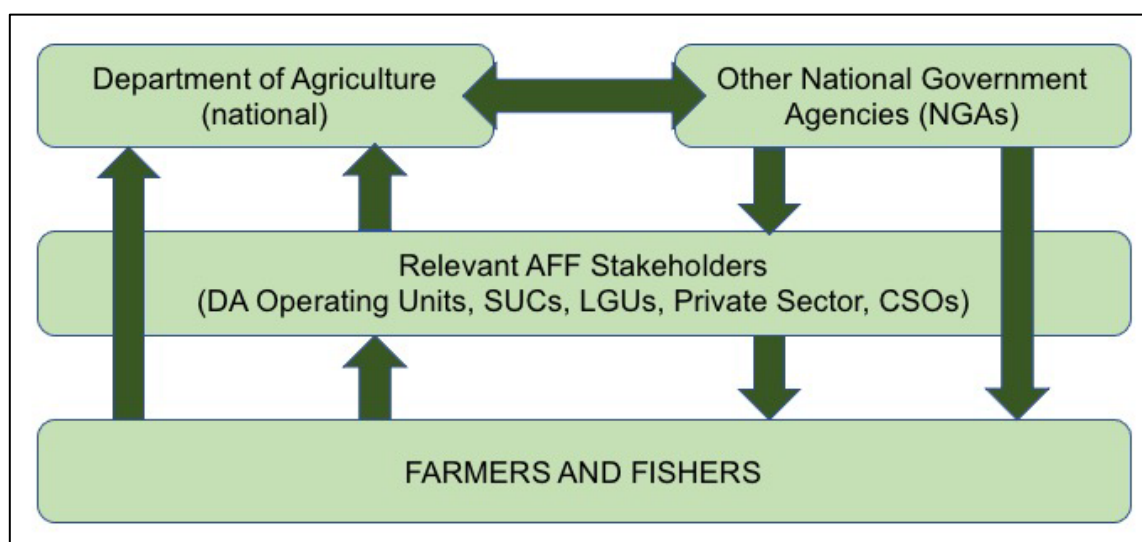
The Unit has also been striving to practice consistency, clarity, and conciseness in developing key messages that will be incorporated across various communication tools for identified intended audiences. SWOT analysis has also helped the Unit define and adjust its communication plan, and become more strategic in allocating resources for tools and outreach activities that would result in ‘wider and more sustained impact.’

In summary, there is difficulty providing a fair evaluation of the communication strategies employed for past iterations of the AFMP without any document pertaining to it containing specific and measurable objectives, and measures for evaluating if these have been met. The lack of baseline data on audience and stakeholders’ knowledge, skills, attitudes, and practices on developing and modernizing the sector also poses a challenge in drafting an effective plan. This is particularly helpful for achieving the objective of the Office of Strategic Communications in “fostering a shift in perception in agri-fisheries” to help counter what it has observed as traditional thinking especially in the countryside.

*2. Bridging the information gap between knowledge-producers, and AF stakeholders and intended audiences, remains a challenge.*

The AFMP (2018-2023) had developed a communication framework to guide the participatory process for a diverse set of AF stakeholders. (Figure 11.1). However, the information gap is observed to be affecting a larger group, to cover “the entire chain from farmers to traders, policy-makers, and consumers,” according to the FAO. Lowering the prices of goods, expanding access to more affordable and healthy food, and providing reliable and accurate data are just some measures identified in the AFMPs that aim to enhance the health and protect the welfare of consumers. However, the previous plans have no specific communication objectives directed at this set of stakeholders.

**Figure 11.1: Communication Framework (AFMP 2018-2023)**



Further, the existing institutional and governance structure for communicating the plan is largely dependent on the Department and its operating units, as well as other government

agencies at the national and regional levels under the framework.<sup>33</sup> At the same time, feedback is expected to flow between stakeholders including state universities and colleges (SUCs), which generate new knowledge and technological innovations along with other research institutions, local government Units (LGUs), the private sector, civil society organizations, and beneficiaries of the extension services system.

This process is aligned with Section 87 of AFMA where “information and communication support services through tri-media” are among the major services to be provided to the farming and fishing community, aside from training and advisory services. Under the law, extension services are a shared responsibility among the DA, SUCs, and LGUs, which are responsible for information dissemination.

However, lingering issues within the bureaucracy and external forces have become stumbling blocks to effectively communicating vital AF information to stakeholders. Despite government’s efforts to improve the extension services in the country with the help of development partners, a recent World Bank report on *Transforming Philippine Agriculture During Covid-19 and Beyond* has validated a number of issues with extension services.

Under the decentralized set-up where LGUs implement the DA’s programs and provide these services, extension programs were noted to have suffered from “poor execution, insufficient funding or poor management.” Other challenges noted include the lack of a standard menu of services provided by LGUs, with methods of delivering information described as ‘problematic’ partly due to unqualified or unskilled extension workers. The report also points to extension messages containing insufficient data and requiring a more packaged information approach to adapt to the “New Thinking for Agriculture.”

There is also a need to follow through with the establishment of the National Information Network (NIN) as mandated by AFMA, to promote linkages between DA offices at all levels with research institutions and local end-users. The NIN was envisioned to provide accessible AF information and marketing services such as data on supply and demand, price trends, and market forecasts.

Some agriculture groups had observed last year that the delay in implementing NIN “is the reason for the disconnect between farmgate and retail prices for agricultural commodities.” They also attributed ‘unfair trade and smuggling’ on the failure to operationalize the NIN. The most recent AFMP had underscored the importance of implementing the NIN with its key elements, as critical to carrying out results-based monitoring and implementation including systems and protocols for data privacy and security that ensure high-quality data.

3. *Engagement with national government agencies, key stakeholders, civil society, the private sector, and development partners needs to be sustained, strengthened and made more inclusive.*

Throughout the implementation and updating of AFMPs, the DA has sought to institutionalize meaningful participation for all stakeholders in the development of the AFF sector. In addition to consulting stakeholders in the planning and budgeting process, DA has engaged its stakeholders in formulating and reviewing new and amended policies, programs, projects, and activities that directly affect them.<sup>34</sup> These help to ensure that stakeholders provide input to policy dialogue and contribute to a stronger sense of ownership and sustained participation.

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<sup>33</sup>The institutional environment and limitations therein are discussed more thoroughly in the Governance, Accountability, Institutional, Cluster, and Capacity Development paper.

<sup>34</sup>AFMP 2011-2017 on Policy and Planning

The previous AFMPs had indicated that regular consultations with stakeholders can also provide an effective feedback mechanism where progress on the accomplishment of deliverables and goals of the NAFMIP can be presented; and where problems, issues and other concerns in their implementation may be aired. These may also serve as an avenue for sharing lessons learned, success stories, and good practices. Workshops, orientations, and other fora may also highlight the importance and uses of the Plan, increase awareness, and ensure deeper understanding of it among stakeholders and partners.

While the Plan had underscored the principles of accountability and transparency in presenting outputs reached from consultations, a number of agricultural organizations have recently demanded more transparency and extensive consultations on the formulation and implementation of the successor AFMP. In particular, media have reported how farm groups in 2020 appealed to the DA for participation in budget discussions, and to establish clear performance targets and verifiable impact indicators from the Plan. The DA, through PCAF, may consider expanding their engagement to these and other non-organized groups who are not yet accredited and being consulted on AFF development.

PCAF is currently engaged in the participatory monitoring and tracking of DA's programs, projects, and strategic directions; as well as in the recruitment of A&F Councils under its partnership development. Given its strategic thrusts, one important insight gleaned from the consultation held with DA in July 2021 on communicating NAFMIP is the need to consider the organization's absorptive capacity and adaptive mechanisms, which are typically overlooked.

In particular, PCAF Executive Director Dr. Liza G. Battad emphasizes how the appropriate and relevant implementation of DA's strategic directions depends on its organizational development. Further, "organization behavior and applying science in how we do things" are critical in bringing about impact through the advisory special bodies, in terms of productivity, profitability, and sustainability of the eight paradigms or the OneDA Reform Agenda.

Sustainability is also an issue where questions on the continuity of PCAF's consultative bodies such as the Agriculture and Fisheries Councils (AFC) and Sectoral Committees need to be addressed. A 2016 study that looked into their profile and performance identified that budget constraints and succession planning are just some of the challenges, with majority of members of the AFCs belonging to the older and senior age group. In addition, the study revealed that the younger generation's low interest in agriculture poses a problem in sustaining the work of the AFC, which includes helping build consensus and support for sector modernization and monitoring its progress.<sup>35</sup>

4. *Leveraging the use of Information and Communication Technology (ICT) is key to promoting knowledge-sharing and more inclusive engagement on AF modernization.*

Studies have affirmed how ICTs hold the potential for more effective inter-agency and multi-level collaboration with a complex set of stakeholders such as the agri-fisheries sector's. FAO has also underscored that the fast growth of ICTs offers "cost-effective solutions and accelerates the flow of more reliable data and information" that can benefit the sector (Figure 11.2).

The AFMP (2011-2017) had projected that the DA's vision for knowledge-driven people empowerment can be met with efficient use of ICTs that will bring together clients and the AFF production and processing stakeholders. The DA had identified e-learning as a form of distance education that leverages the Internet and the World Wide Web for information dissemination and sharing of knowledge in agriculture and fisheries. The previous Plan had

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<sup>35</sup>Participatory Governance in Agriculture and Fisheries Development: An Evaluation on PCAF's Consultative Bodies



also intended using mobile and Internet-based communications to deliver training on new agricultural technologies to intended beneficiaries and stakeholders who were geographically dispersed.

The Agriculture Training Institute (ATI) has since delivered on this promise to make information more accessible, with the help of the Department of Science and Technology's Philippine Council for Agriculture, Aquatic, and Natural Resources Research and Development (DOST-PCARRD), for the establishment and management of the e-extension program that covers e-learning, e-farming and e-trading. While this has become a useful tool for knowledge sharing of consolidated research data for farming and fishing communities, the program also faces many challenges.

Insights from the PRDP InfoACE have also revealed that ICTs (e.g., social media networks) should be maximized given the project's limited funding for paid media. In addition, younger audiences who are also practicing agriculture can be reached through online platforms where sustainable science-based governance tools may be promoted.

## Potentials and Constraints toward Sector Transformation

1. *The evolving media landscape backed by the rapid development of ICTs holds promise in "providing new platforms for accessing information directly by farmers and rural households, extension workers, agribusiness entrepreneurs and others."*

Outreach via traditional media can now be complemented by online channels that facilitate the flow of two-way communication in real time. The following statistics from International Communication Union (ITU) and Statista should be considered as this will impact on the DA's communication strategy and tools to be employed for reaching audiences, especially those in geographical locations that have no Internet or mobile access.

- The number of internet users has grown to 73.91 million people in the country in 2020, or more than half of the total population, with majority belonging to the age group of 16 years old and above.
- Mobile phones are the leading device for accessing the Internet in the Philippines, which is used for both communication and accessing information.
- A quarter of the population accessed the Internet using their mobile phones in 2018, with projections that the number will reach almost half of the population by 2023.
- There are almost 74 million Facebook users in the Philippines as of 2019 and the number is expected to reach 88.1 million by 2025. A total of 47 million users access the social network via mobile on a monthly basis, making Filipinos the second largest market for Facebook in the Southeast Asian region.

On the other hand, ITU has flagged the wide gap between urban households and the rural population in its 2020 report titled "Measuring Digital Development." Data from the National ICT Household Survey reveals that only 17.7% of all households have Internet connection and that seven out of 10 barangays have no access to fiber-optic cables, while 64% have no access to cellular towers. Worse, the National Telecommunications Commission also said that the Bangsamoro Autonomous Region in Muslim Mindanao, Bicol, Eastern Visayas, Cagayan Valley, MIMAROPA, Norther Palawan and Central Visayas are unserved or underserved.

2. *The changing media consumption behavior of farmers and fishing communities offer some opportunities for the DA to deliver vital information and acquiring and closing the feedback loop.*



Three decades ago, the primary source of information by farmers were other farmers, with information programs found to be “limited and inadequate” based on a study that covered five regions in the country.

Fast forward to May 2020, reports from local media noted that a couple of months after the COVID pandemic broke in the country last year, some farmers have taken to social media to work around the lockdown and quarantine protocols that restricted movement of goods. Facebook was used to search for buyers online, while Messenger platform with its group chat function is being used by farmers and fishers interviewed in the municipality in Gumaca, Quezon Province for sharing information to complement face-to-face interactions. Meanwhile, young farmers are gaining influence among netizens who use digital platforms such as YouTube and Tiktok to promote agri-fisheries among their age group.

Communicating the NAFMIP can also take advantage of the following behavioral changes observed on social media based on the latest report of *We Are Social: ThinkForward2020*:

- People are engaging with longer and more complex narratives on social media. Adding depth and context to posts with long-form captions on what used to be short-form platforms like Instagram and Twitter has evolved amidst rampant misinformation and to encourage interaction and participation. Brands, according to the report, should also let people tell their story.
- People are using closed communities as safe spaces to discuss controversial topics in a moderated environment, to avoid public debates online which are rarely balanced. Harnessing the ‘hive mind’ or private groups can be more engaging in so-called close spaces.
- People are merging cultural influences to reflect their individuality, and tapping into niche communities can target segments of audiences more effectively. Take for example the “*plantita*” culture that can be related to urban agriculture.

**3. *Increasing media attention on the pandemic also offers a platform to highlight modernization and industrialization of the sector.***

The COVID-19 pandemic has forced the government to readjust its approach and refocus priorities to limit the negative impacts on the country’s agricultural production and food supply chain. With the pandemic still unfolding in its second year, the government, including the DA, continues to be under the media spotlight with increasing focus on ensuring food supply for the country while addressing other urgent issues in the sector. This presents an opportunity to underscore the eight paradigms under the OneDA Reform Agenda within the context of the pandemic, where “agriculture is a pathway to economic recovery,” through media interviews, media workshops and its twice-a-week virtual pressers, to name a few outreach activities.

Traditionally, news coverage of agri-fisheries does not figure prominently in the media agenda. Particularly on the topic of biotechnology, a study found that controversial events triggered media attention but such attention was temporary. An earlier study, which reviewed the practice of agricultural journalism in the country covering the three major broadsheets, showed that these papers only allotted 5% of the total stories to agri-fisheries. There are, however, efforts to boost interest in agri-fisheries-related stories in traditional media with some broadcast programs and columns dedicated to the sector. The private sector and professional groups have granted agriculture journalism awards to writers for promoting awareness about issues concerning the sector. Social media is also rife with agriculture content, food systems, nutrition, and related themes, which the DA may review and consider in employing its digital campaigns.

4. **The spread of disinformation, coupled with the preoccupation of COVID-related developments and more pressing issues in agriculture threatens to dilute key messages on the topic of modernization.**

These challenges cited by the Office of Strategic Communications and PCAF also include:

- Simultaneous information campaigns on rice and ASF as well as new banner programs and projects may distract or cause information overload in intended audiences.
- The demand for real-time responses to audience feedback in social media channels threatens to overwhelm teams managing these platforms.
- Organized opposition from special interest groups has gained voice.
- Understanding and appreciation of OneDA strategies, principles, and challenges need to be fostered and its concepts laymanized.

5. **Sustainability of reforms in communication and stakeholder engagement is key and needs to be addressed and skillfully managed given the regular political cycle and corresponding leadership changes in government including in the DA.**

Institutionalizing these reforms are critical in helping meet the goals and objectives of the Plan. These cover the creation of new offices such as the Office of Strategic Communications, which provides direction and supervision over outreach and dissemination; the co-implementation of DA programs and projects with civil society organizations; and new guidelines created for engaging with AFCs under PCAF’s newly-launched strategic plan.

### Strategies Aligned with DA New Thinking in Agriculture

Under the OneDA Reform Agenda, Strategic Communications cuts across the 18 strategies that will be advancing the strategic goals of the sector and increasing awareness among its stakeholders, partners, and general public by planning, executing, and assessing comprehensive and proactive communications strategies.

Reconstituted by Secretary Dar on 14 January 2021, the Office of the Spokesperson and Assistant Secretary for Communications and Media Affairs takes lead in effectively integrating the DA’s IEC efforts using traditional and digital platforms. It also provides cross-cutting support and reports on the gains of the other thrusts (Figure 11.2).

**Figure 11.2: Key Strategies under OneDA Reform Agenda**

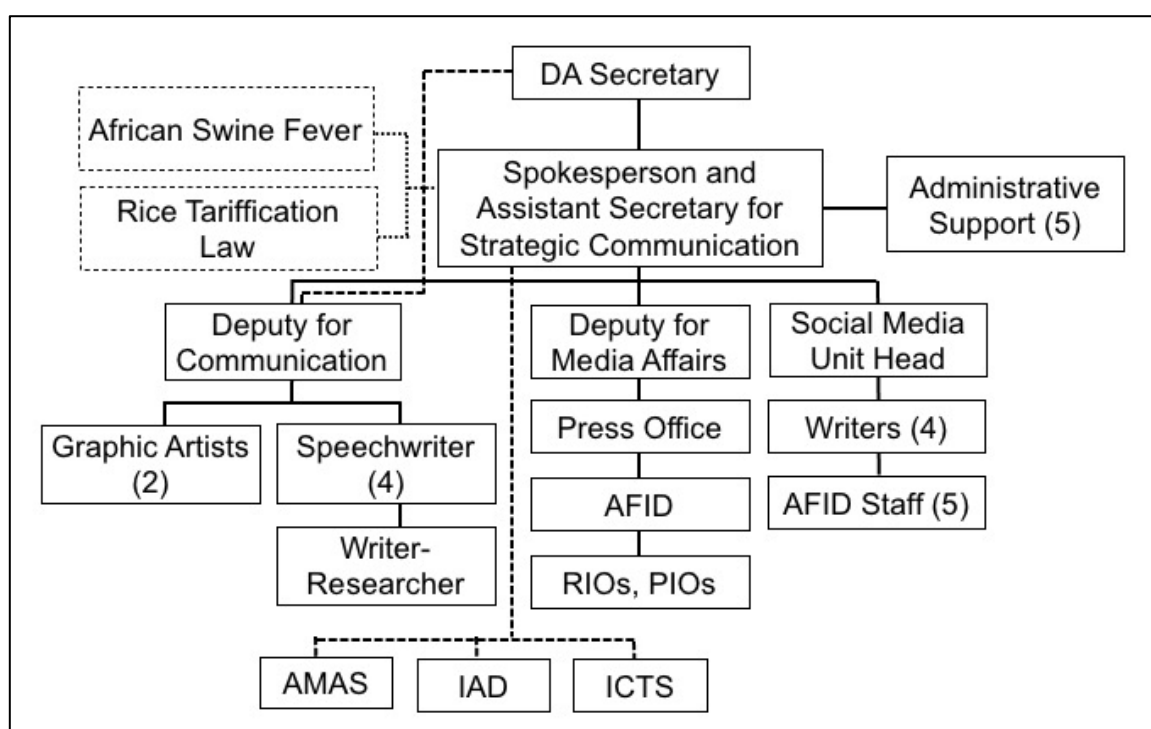


Secretary Dar has directed the Office of the Spokesperson to closely coordinate with the Presidential Communications Operations Office (PCOO), the Presidential Spokesperson and the Department of Trade and Industry to ensure consistency in messaging on the country’s food security. In implementing OneDA, the Office is also expected to work closely with the its nine bureaus, 22 attached agencies and corporations, and 16 Regional Field Units (RFUs) to conduct information and education campaigns.

Attached to the Office of the Secretary are also eight services including the Agribusiness and Marketing Assistance Service (AMAS), the International Affairs Division (IAD), and Information and Communications Technology Service (ICTS) that support strategic communications.

Supporting the Communications team is the Agriculture and Fisheries Information Division (AFID) which provides material and technical support to various campaigns and oversees DA’s Regional Information Offices and the Public Information Offices of its attached agencies and corporations to ensure message alignment and consistency. The ICTS meanwhile provides technical assistance for the smooth operation and maintenance of official online channels of the DA (Figure 11.3).

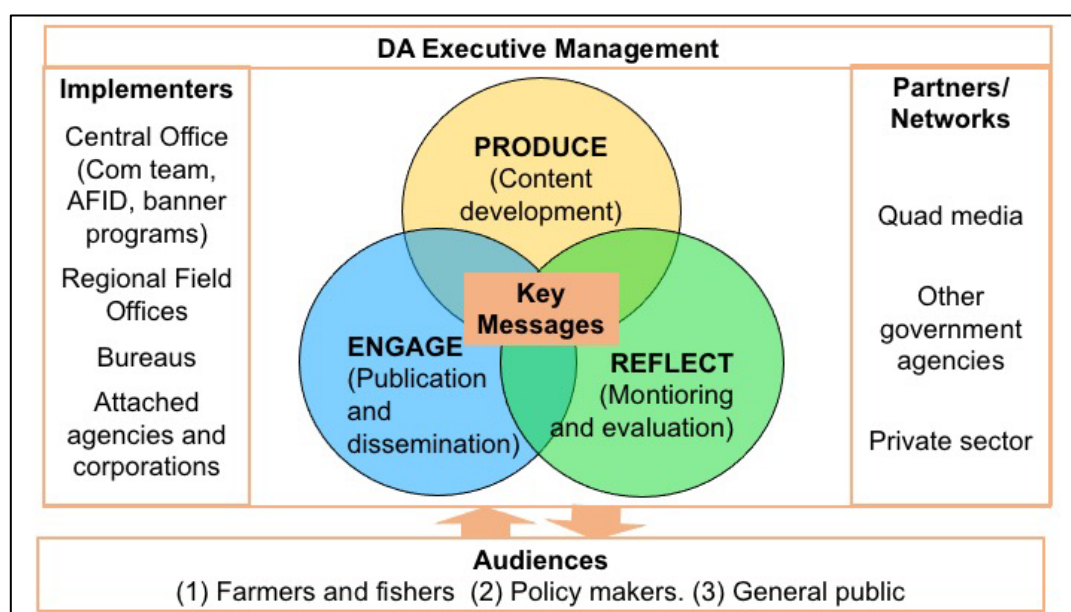
**Figure 11.3: Organogram of DA Office of the Secretary – Communications Team**



Its framework anchors on three major strategies of production, engagement, and evaluation, in collaboration with implementers and partners, while taking into account feedback from its intended audiences (Figure 11.4).

The overall communication strategy for the AF sector is driven by DA’s goal to increase awareness among its stakeholders and influence public opinion. It also reflects realities on the ground concerning the changing media environment and demands from its many clients in the sector. Most notable is its move to reach out to new stakeholders in the wider food system to include consumers, women, and the youth, and collaborating more with development partners in order to “build an ecosystem of key players in the food system.”

**Figure 11.4: Communication Framework under OneDA**



Under OneDA, stakeholder engagement will also be strengthened through PCAF to ensure implementation of key development strategies at the national, regional, and local levels.

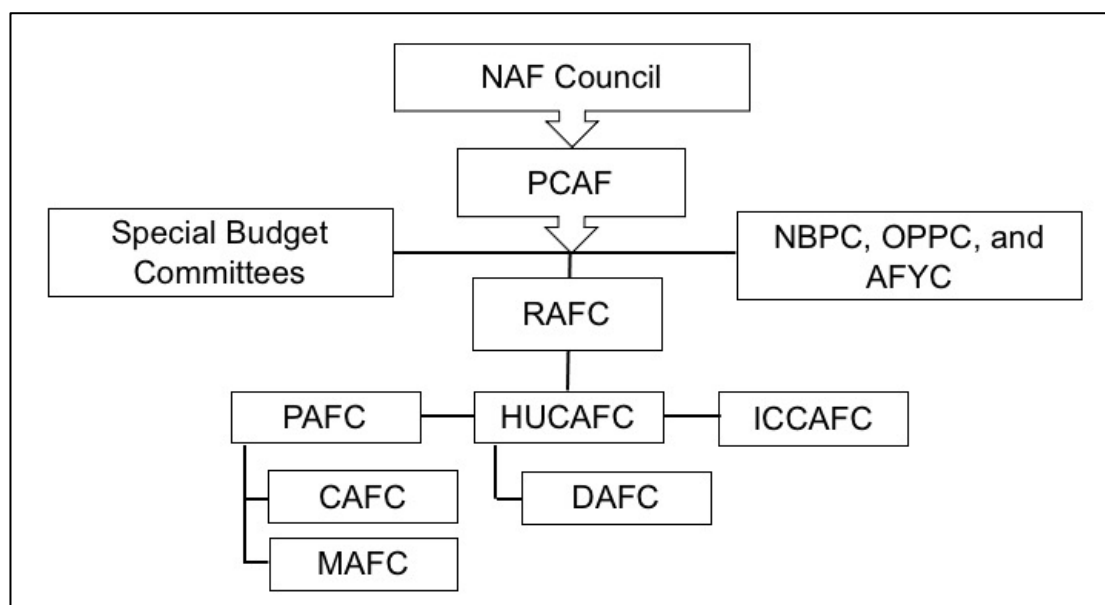
More specifically, DA will employ a “steering and rowing” approach in advancing its modernization agenda—with the DA at the helm to steer its partners while key stakeholders including local government units, the private sector, the academe, and civil society organizations are envisioned to row under its guidance and direction.

In particular, PCAF’s strategic plan has been calibrated with the launch of its Innovative Consultation for Agriculture and Fishery (A&F) Policy Reforms and Engagement (iCare) value-creating strategic shift, which features four major strategies summarized below:

- WeAdVoCATE (Advance Voices and Choices of the A&F Sector Toward Empowering Enterprises) – expansion of value chain organizations to be members of the policy council by advancing voices and choices in the agri-fisheries sector toward empowering enterprises
- WeCoNSULT (We Collaborate with Networks of Agriculture and Fishery Stakeholders to Unify and Lead Transformation) – action-oriented policy service delivery through adaptive, innovative and broad-based consultation process
- WeTRACK (We Transform Results into Actions through Collaborations and Knowledge Sharing) – encouraging the private sector to look into and assess DA’s programs, projects, and strategies for improved plan, policy, program, and project formulation,
- WeINSPIRE (We Institutionalize and Nurture Systems and Processes for Integrated and Reliable Management) – support services critical in the effective functioning of the three service brands that, in due course, will inspire a results-based organizational development congruent with the government’s public expenditure management reforms through performance-informed budgeting and program expenditure classification structure

Engaging stakeholders in the sector from the national level all the way to the municipal agri-fisheries councils will be guided by an updated framework (Figure 11.5) developed in consultation and in agreement with implementing units in the DA.

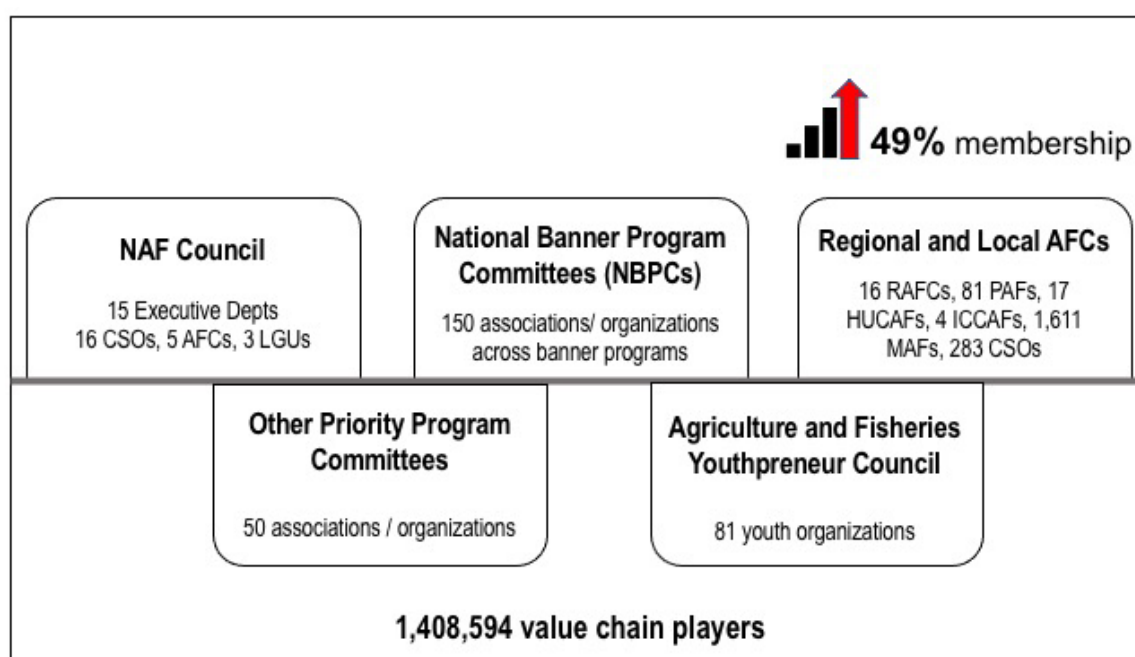
**Figure 11.5: Updated Framework for Engaging Stakeholders in the Agriculture and Fishery Sector**



Source: PCAF presentation during Communication Consultation

An important development is the launch of the Agriculture and Fishery Youthpreneur Council (AFYC) composed of 81 youth organizations that participated in policy development aligned with the OneDA Reform Agenda. The addition of the youth sector reflects the similar strategy of the Communications team in encouraging participation of millennials and the Gen Z cohort. This is reflected in the PCAF stakeholder map below which has registered a substantial increase in total membership (Figure 11.6).

**Figure 11.6: Stakeholder Communication Map of the National Agriculture and Fishery Council as of 30 June 2021**



Source: PCAF presentation during Communication Consultation



## Indicative Policies, Programs, Activities, and Recommendations to Address Potentials and Gaps

The DA, strives to seize opportunities and address the gaps in its communication and engagement with stakeholders and to the wider public with the following measures in place:

1. ***Effective coordination with attached agencies, bureaus, and relevant national agencies under OneDA Reform Agenda and whole-of-government approach***

The OneDA Reform Agenda bodes well for addressing the overall institutional and governance issues still prevailing in the department. It will also benefit the participatory planning, development, and execution of the communication component, which planners and stakeholders at all levels should be recognizing as an integral part of the NAFMIP.

It is recommended therefore to incorporate the communication plan for NAFMIP in the annual planning and budgeting for specific programs and projects, aligned with the internal process in the DA and in LGUs.

Establishing clear reporting and communication lines will promote better coordination and collaboration as well as accountability across the DA and with its partners in government, civil society, and the private sector. Internally, the DA should be supported by its regional field offices, bureaus, attached agencies, and corporations to carry out “coordinated, complementary and consistent” actions. These efforts will be guided by the goals and objectives of the communication plan that are grounded in the NAFMIP results framework.

2. ***The collaboration to reform extension services in the country through the establishment of the Provincial Agriculture and Fisheries Extension Services (PAFES) will contribute to the improvement of research and extension.***

PAFES is being pilot-tested in several provinces in partnership with the Coalition for Agriculture Modernization (CAMP) composed of volunteers from agriculture, agribusiness, industry, academe, government, and professional and international organizations. The DA and the coalition share the view that the project will improve linkage between research and extension services, with more governors indicating interest in rolling out the project in their respective provinces. Efforts to institutionalize PAFES in collaboration with policymakers are also underway to help ensure continuity into the next administration.

3. ***Strategic utilization of traditional and online platforms and engagement with media and influencers***

The DA will employ a range of tools and activities for specific intended audiences to include press releases, virtual pressers, testimonials, and digital content to provide updates and announce new information. A snapshot of the matrix of activities (Table 11.2) obtained from the Communications team provides an overview of the types of tools produced for various platforms, as well as the team or unit in charge, aligned with its three-pronged strategy in Figure 11.4: (a) produce – the development and production of knowledge products and content, (b) engage – promote knowledge-sharing and learning activities for impact, and (c) reflect – provide measures for determining achievement of targets set through daily media monitoring of online platforms, print, television, and radio—while monthly content analysis and recommendations will be supported by the work of consultants.



**Table 11.2: Activities of the DA Strategic Communications Team**

TARGET OUTPUTS	DESCRIPTION	OBJECTIVELY VERIFIABLE INDICATORS	RESPONSIBLE UNIT/PERSON
<b><i>Produce / Content Development</i></b>			
Press releases (News, Feature, Bulletins, Statements, Fact sheets)	Data collection, drafting, editing, and publication	_____ press releases with a max of 2 revisions published per week	AFID/Comms/ Press Office
Speeches	Data collection, drafting, editing, submission, coordination, briefing	100% of requests for speeches with minor revisions responded to a day before the event	Comms
Responses to complaints and crisis communication	Data collection, drafting, editing, submission	100% of letters of complaints answered in 15 days after receipt	Comms
Information, Education and Communication (IEC) Materials			
Print (Flyers, booklets, leaflets, posters, books, primer)	Management, drafting, editing, layout, packaging	_____ print IECs with a max of 3 revisions to meet printing schedule	AFID/Comms
Social media (Infographics, pictogram, snippets, quote cards)	Management, drafting, editing, layout, packaging	_____ socmed IECs with a max of 3 revisions for scheduled posting	Comms
Audio-visual (TV/radio plugs, documentary, MTVs, jingle)	Management, drafting, editing, layout, packaging	_____ AV materials with a max of 5 revisions for scheduled dissemination	AFID
<b><i>Engage / Publication and Dissemination</i></b>			
Online portals/Social media			
1. Website	Management of portal and uploading of content	6 <sup>th</sup> spot secured in the top 10 most liked government websites in June	AFID/Comms
2. SWDD's FB page	Account Management, responses to queries, boosting of posts	_____ page likes achieved until December; 10% increase in followers every month sustained in 2021	Comms
3. DA's FB page	Account Management, responses to queries, boosting of posts	_____ page likes achieved until December; 10% increase in followers every month sustained in 2021	Press Office
Broadcast programs – TV, Radio	Management, conceptualization, placement	All TV programs well-managed for airing as set	AFID
<b><i>Reflect / Monitoring and Evaluation</i></b>			
Media Monitoring	Quad-media monitoring (online, print, TV, radio)	1 report on story monitoring submitted daily	Comms/AFID
Evaluation	Analysis and recommendations (analytics)	1 report on analysis and recommendations submitted monthly	Comms/AFID
Communication Support to DA Programs	1. RCEF 2. Rice CMT 3. Swine CMT	3 programs/task forces supported as requested	Comms

Source: DA Communications Team

The Office of the Secretary has also created a social media unit in recognition of the important role of digital media in communicating key messages on food security to a broader audience. The DA hopes to encourage ‘active engagement among the public and private sectors that will evolve into valuable relationships.’ Special Order No. 69, Series of 2021 thus designated three teams in the unit under the Office of the Secretary: (1) Content Creation that is responsible for producing and posting editorial content in coordination with bureaus and attached agencies, (2) Social media Managers who will be in charge of the engagement strategy for promoting DA’s programs and projects and updating content with press releases and photo essays on a daily basis, and (3) Community Managers who will engage and connect with audiences including supporters and opposition.

Some noteworthy practices of the team include regular media monitoring, which is considered to be a “first temperature check” on the public’s receptivity to new initiatives and programs. Monitoring top issues on a weekly basis provides the team and the Office of the Secretary with key insights for analyzing content of print media coverage. Cross-posting of content from traditional to digital channels also helps to gather feedback and sentiments on important issues, which are critical to crafting key messages and adjusting the communication strategy. It is recommended that regular analytics for social media and other online campaigns in addition to media monitoring and other evaluation tools are periodically conducted, to come up with a more robust review and analyses of engagement on both traditional and digital platforms

**2. *Development of a message house for cascading to RFOs, bureaus, attached agencies and corporations, and to the wider public aligned with the NAFMIP goals and objectives***

Responsible messaging backed by data and analyses, informed by stakeholders and delivered consistently across the organization, implementers and partners by a pool of experts or resource speakers is also a proactive practice. Tapping champions and ambassadors in government and civil society as well as amplifying the voice of farmer and fisher leaders are also considered effective strategies for expanding the reach of key messages.

**3. *Timely and relevant feedback to the public’s concerns on food security and other pressing issues***

The Office of the Spokesperson recognizes its critical role in facilitating feedback among the state, the DA, and its various stakeholders. It also considers public reactions enabled by real-time responses on the Internet as important input to the Department’s strategic directions, hence a dedicated social media team will be designated to respond to valid questions and concerns. In taking stock of relevant views especially those critical of the government, the Office understands the need to balance the interests of farmers, fishers, and consumers.

It hopes to produce fast and data-driven output to stakeholders and contextualize crises including the pandemic, “within long-term perspectives of food security.” Moreover, it aims to skillfully manage its response to what it describes as uninformed populist views on various media platforms to trending topics such as the impact of the pandemic on the country’s food security, the effects of the passage of the Rice Tariffication Law, the Rice Competitiveness Enhancement Fund, and other rice-related issues. The Communications team has also identified the African Swine Fever, food supply, and impact of disasters and calamities on agri-fisheries as top issues that also garner media attention.

4. ***Continuous training and skills building for Information and Communication staff based on training needs assessment.***

This will ensure that staff knowledge and skills are updated given the rapid development of new applications that appeal to the youth demographic. As early as 2014, DA information officers have been using social media platforms to provide updates on the status of PRDP in various parts of the country. Training was provided to maximize their use of social media platforms, aimed at promoting transparency and increased public awareness in implementing the project, particularly in Western Visayas.

Training on producing communication tools such as infographics was also provided to improve presentations on project updates through social media platforms. Similar training on the production of videos, video blogs, and other tools were also conducted for information officers in Davao City in 2015 by World Bank communication officers to promote more engaging digital content for online channels. Staff have further expressed interest in training on strategic communication in light of developing and later communicating the NAFMIP from the first round of consultations on this with the DA held in July 2021.

In addition, it is recommended for communication and information officers in the DA and its attached agencies to take refresher training on various types of communication approaches that will be required in executing the multi-level, multi-platform and multi-directional communication component of NAFMIP. These include skills-building in the areas of:

- corporate communication for internal and inter-agency outreach with government and the private sector on the NAFMIP vision and mission;
- marketing to aid in boosting investments in the sector; and
- advocacy to generate and strengthen support among policy makers and civil society on achieving the goals and objectives of NAFMIP.

5. ***Strengthen stakeholder engagement based on an analysis of their knowledge, skills, attitudes and practices, as well as media consumption.***

It is highly recommended for the DA to conduct soonest its planned evaluation of past communication outreach and stakeholder engagement for flagship programs and priority projects including for AFMP. Further, the study should **integrate stakeholder mapping** to identify an expanding list of stakeholders to include consumers. An analysis of stakeholders' knowledge, skills, attitudes, and practices, as well as types of media used, is also helpful.

Taking into account people's views on the themes of food and nutrition security may put off potential clashes or cultural differences during implementation of the new plan, and contribute to strong ownership among stakeholders. Findings from the evaluation will form the baseline data of a comprehensive and independent evaluation critical to designing, adjusting and refining the strategy for the communication component.

Other programs and activities being planned or already being undertaken by PCAF and the Office of Strategic Communications in response to the key lessons learned and gaps identified are summarized in Table 10.3.

**Table 11.3: Programs and Activities Addressing Current Gaps/Challenges**

CONSTRAINT/ISSUE	PROGRAMS/ACTIVITIES
Sustainability, effectiveness and inclusiveness of consultative bodies	<ul style="list-style-type: none"> <li>• Policy-driven new Strategic Plan facilitating the entry of more members including youth organizations;</li> <li>• Co-implementation of DA projects with civil society with support from Office of Strategic Communications on information dissemination</li> <li>• Strengthening monitoring and feed forward mechanisms on policies for implementation</li> </ul>
Bridging the information gap amidst the pandemic	<ul style="list-style-type: none"> <li>• Conducting virtual and hybrid consultations with national, regional and local stakeholders, including with media, champions, and ambassadors, while providing assisted video-conferencing to disadvantaged groups to continue providing vital agri-fisheries information</li> <li>• Collaborate with Office of Strategic communications in discussing urgent/emerging issues and concerns on supply and access to products, prices of products, ASF management and eradication</li> </ul>
Organizational Capacity	<ul style="list-style-type: none"> <li>• Introduction of service ambassadors to enhance the work of PCAF in advocating, consulting and tracking</li> <li>• Continue the implementation of the National Information Network Mobilization Plan covering information systems/data requirements, connectivity, organizational and especially investment requirements for the duration of implementing NAFMIP, based on an evaluation or mid-term review of its initial accomplishments.</li> </ul>

In closing, preparing the NAFMIP and its communication component is aptly rooted in the principles of Communication for Development developed by FAO that integrates communication in the preparation, implementation, and evaluation phase of the Plan. Also referred to as Development Communication, planners and implementors are encouraged to adopt this comprehensive, flexible, and participatory approach for developing the communication plan that is suited to the diverse set of stakeholders in the AFF sector, focusing on a “two-way, dialogic processes based on listening, interaction with and among stakeholders, convergence of different media, valorization of indigenous knowledge and the generation of local content.”

**Figure 11.7: Steps in Developing Communication Component in Agricultural Programs (FAO Sourcebook, 2014)**



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## The NAFMIP Preparation Team of Experts

### Mr. Cesar B. Umali, Jr.

is the **Development Planning Specialist and Leader of the NAFMIP Preparation Team (NPT)** engaged by the Asian Development Bank. He is a regional planner with 40 years' experience in multi-sector project design and preparation, project management, and theory of change-linked M&E. He has worked on 100+ large development projects in 14 countries in Asia, Africa and the Pacific; is a licensed environmental planner; and has published two books and several journal articles on development planning.



### Dr. Marites M. Tiongco

is SEARCA's **Agricultural Value Chain Expert and NPT Deputy Team Leader**. She is Professor of Economics and immediate past dean for six years at the School of Economics of the De La Salle University in Manila. Her various research interests include the economics of agricultural development with emphasis on critical natural resources and policy issues as they affect food security, food and water safety along the value chain, market access of smallholder crop and livestock producers, agricultural health and productivity, climate change mitigation, adaptation, and resilience, and environmental sustainability. She has published over 40 articles and one of her papers was a 2018 Outstanding Scientific Awardee by the NAST. For ten years, she had served as research fellow at the International Food Policy Research Institute (IFPRI) in Washington, D.C., USA. She earned her PhD in Agricultural Economics from the University of the Philippines (UP).



### Dr. Eufemio T. Rasco, Jr.

is SEARCA's **Agricultural Crops, Livestock, and Poultry Expert**. He is also Chair of the Agriculture Sciences Division and Academician, National Academy of Science and Technology (NAST), DOST; Professor Emeritus at UP Mindanao; and President of the Coalition for Agriculture Modernization of the Philippines (CAMP). He draws his contributions to NAFMIP from his 12 years' experience in agricultural development in eight Asian countries with the International Potato Center (CIP); eight years as research director of East West Seed Co. during the company's founding years in the Philippines; having served as team leader of the multisectoral Philippine team of 15 organizations that won a special mention in the highly competitive Food System Vision Prize of the Rockefeller Foundation; six years as director of UPLB Institute of Plant Breeding; and four years as PhilRice Director. Dr. Rasco has authored five books, four on crop industry development and one on plant biotechnology.



### Dr. Roberto F. Rañola, Jr.

is SEARCA's **R&D and Extension Expert**. He is a retired Professor of Agricultural and Applied Economics at the University of the Philippines Los Baños (UPLB), where he also served as Vice Chancellor for Administration. Among his various projects, he was a core team member and UPLB program leader of the research project "Managing Environmental Risks for Sustainable Food and Health Security in Watershed Planning in Southeast Asia" funded by the Research Institute for Humanity and Nature (RIHN), Japan. He also worked on the implications of climate change on Philippine Agriculture as part of the updating of the Agriculture and Fisheries Modernization Plan for the Department of Agriculture, funded by UNDP. He currently serves as Chairman of the Board of Trustees of the Philippine Association of Agriculturists; private sector representative of the governing board of the National Nutrition Council of the Philippines; and affiliate faculty member of the Vietnam National University, Hanoi. He earned his PhD in Agricultural Economics Major in Resource Economics from the University of Minnesota.



### Ms. Brenda B. Furagganan

is FAO's **Agriculture Sector Monitoring and Evaluation Specialist**. She is an Adjunct Faculty Member and Research Manager at the Asian Institute of Management (AIM) with a Master in Development Management from AIM, Master of Business Administration from Adamson University, and BS in Computer Data Processing Management from Polytechnic University of the Philippines. She has led private and nongovernment development initiatives and served in various leadership capacities (Director level) at the Technical Education and Skills Development Authority (TESDA).



### Dr. Caesar B. Cororaton

is SEARCA's **Policy, Trade, and Regulations Expert**. Aside from trade and agricultural policies, his research also focuses on poverty and distributional issues in developing countries using computable general equilibrium (CGE) model, which captures the direct and indirect effects of policy shocks. He is a Research Fellow at Virginia Tech, USA and consultant at IFPRI, where he also served as research fellow in 2005 to 2008. Prior to this, he was a Senior Research Fellow at the Philippine Institute for Development Studies (PIDS) for more than 12 years. Dr. Cororaton earned his PhD in Economics from Clark University, Worcester, Massachusetts, USA in 1990. He has an MA in Economics from UP, an MS in Industrial Economics from the University of Asia and the Pacific (then CRC), and BS in Management Engineering from Ateneo de Davao University.



### Dr. Cristino L. Tiburan, Jr.

is SEARCA's **Geographic Information Systems (GIS) Expert** and Associate Professor at UPLB, where he heads its GIS and Remote Sensing Team. He has served in numerous projects as GIS specialist. He earned his Doctorate in Environmental Studies from Kyoto University, Japan and MS and BS in Forestry (cum laude) from UPLB.



### Dr. Cleto L. Nañola, Jr.

is SEARCA's **Fisheries Expert** and Professor at UP Mindanao, where he is also the current Director of Extension and Outreach Services. Dr. Nañola has worked for more than 20 years in marine science, particularly on the biology and ecology of reef fishes including their conservation and for sustainable fishery. He got his PhD in Marine Science from UP Diliman.



### Dr. Jacquelyn F. Escarcha

is FAO's **Agriculture Resilience Specialist**. Dr. Escarcha received her PhD in Agriculture and Environment from Charles Darwin University, Australia; where she is currently a University Fellow. She also has a double master's degree in Sustainable Development in Agriculture from Montpellier SupAgro-France and University of Catania, Italy. Her prior positions include Assistant Scientist of International Livestock Research Institute (ILRI), South East Asia Region; Research Intern at the USDA-ARS Southern Plains Agricultural Research Center (SPARC), College Station, Texas; and with the DA Bureau of Animal Industry.



### Ms. Justine Espina Letargo

is FAO's **Agriculture Sector Communications Specialist**. She has also served in the World Bank, ADB, and UN agencies. She has a background in broadcast and investigative journalism having worked in PTV 4 and the Philippine Center for Investigative Journalism. She has extensive experience in media relations, digital campaigns, multimedia production, and stakeholder engagement. She's is a graduate of UP Diliman in Broadcast Communication and completed her master's degree in Communications and New Media from the National University of Singapore.



### Dr. Nicasio Angelo J. Agustin

is FAO's **Governance and Institutions Specialist**. He is a graduate faculty member of UP Diliman and has served as consultant in development projects of USAID and AusAID, after his eight-year stint as NEDA Regional Director for Region XI. He earned his PhD and MA in urban and regional planning from UP Diliman.



### Mr. Manuel Jose D. Camagay

is FAO's **Agriculture Supply Chain Specialist**. He is a transport and urban specialist and a mechanical engineer with rich experience in master planning and development, and in automotive design and manufacturing process. Being a consultant for ADB since 2004, he specializes in sustainable transport, interregional trade, physical planning, environment and energy studies, regional cooperation, and database development and branding. He has a bachelor's degree in mechanical engineering, a master's degree in transportation/urban planning, and a doctoral education in energy at UP Diliman. Since 2019, he has worked as program manager for Public Utility Vehicle Modernization Program. He is a director of STRATEON, a start-up aviation consulting group.





### Mr. Rollie L. Osayan

is FAO's **Information Technology Applications Specialist**. He has ten years' experience in designing, installing, and troubleshooting computer systems. He has a BS in Computer Science from Western Mindanao State University, where he received recognition for best IT thesis in his batch; as champion in a web programming contest; and as second placer in the C++ programming contest. (C++ is a general-purpose, object-oriented programming language.)



### SGV Team

**Mr. Christian G. Lauron**, **Mr. Jose Rafael V. Marcelo**, and **Mr. Paul John B. Gesta** comprise the **Agricultural Credit and Financing Team** from SyCip Gorres Velayo Co. (SGV) / Ernst & Young Philippines (EYP).

### Mr. Christian G. Lauron

is SGV/EYP Leader for Financial Services Consulting and Government and Public Sector. He completed his BSc. in Accountancy from the University of Cebu (*magna cum laude*); MBA Major in Finance at the Asian Institute of Management (Dean's List); and MBA International Exchange Studies (Freeman Foundation Scholarship) at The Tuck School of Business at Dartmouth. He is a Chartered Financial Analyst (Level 1), Financial Risk Manager, and a Certified Public Accountant.



### Mr. Paul John B. Gesta

is a Director under the Government and Public Sector and Financial Services Consulting at SGV/EYP, with a focus on development and development finance engagements. He completed his BSc. Commerce degree from the University of Cebu (*cum laude*); MBA at UP Diliman; and MSc. Development Finance (with distinction) at the School of Agriculture, Policy, and Development, at the University of Reading (UK). He was a recipient of the 2018 UK Chevening Scholarship, and the 2009 Ten Outstanding Students of the Philippines awarded in Malacañang Palace.



### Mr. Jose Rafael V. Marcelo

is an Associate under the Government and Public Sector and Financial Services Consulting at SGV/EYP. He completed his BSc. in Applied Economics Major in Financial Economics from the De La Salle University - Manila.



### Dr. Patricia Ann J. Sanchez

serves as SEARCA's **Sustainable Land and Water Management Expert** of the NPT. She is a Professor of Environmental Science and Management and Chair of the Interdisciplinary Studies Center for Water at UPLB. She earned her PhD from the University of Tokyo and master's degree and BS in agricultural engineering from Iowa State University and UPLB, respectively.



### Ms. Elirozz Carlie D. Labaria

coordinates the **FAO Technical Cooperation Program in support of the NAFMIP preparation**. She is the National Disaster Risk Reduction and Management and Climate Change Specialist of the FAO Representation in the Philippines. In this capacity, she supervises the climate change project portfolio in the country office. She is a licensed Environmental Planner with a master's degree in environmental management.



### Dr. Maria Celeste H. Cadiz

is SEARCA's **Editor** for the NPT. She is an independent development communication and knowledge management consultant with experience in KM strategy development and implementation in the public sector. She served as SEARCA's Program Head for Knowledge Management for nine years and led its short-term training program for 12 years. She previously served as Dean and Associate Professor of the UPLB College of Development Communication, and has a PhD from Macquarie University (NSW, Australia) and MS and BS in Development Communication (cum laude) from UPLB. She has more than 20 publications as sole or senior author in her areas of expertise, including a textbook, a monograph, and book chapters in internationally published books.



### Ms. Darlyn R. Angeles

is SEARCA's full-time **Project Associate for the NPT**. She is a licensed Agriculturist with a bachelor's degree in Agri-business Management and graduate courses in development management and governance at UPLB. Previously, she worked as field coordinator for the International Institute for Rural Reconstruction facilitating research and projects for rural development in Guinayangan, Quezon.



### Mr. Patrick Tancioco

served as **FAO's counterpart project coordinating staff** for the NPT in 2021. With a BS in Agricultural Engineering from UPLB, he has supported development projects on top of his varied roles as sports advocate (basketball) and vice president of an IT/e-learning company.



## Notes



